Federal-Mogul Limited

Company Number 163992

Strategic Report for the year ended 31 December 2019

The directors of Federal-Mogul Limited ("the Company") present the strategic report for the year ended 31 December 2019.

Strategy

The Company is a member of a large multi-national group. The strategy of the group is determined by the high-level group management.

The strategy is designed to create sustainable profitable growth by leveraging existing and developing new competitive advantages. This strategy consists of the following primary elements:

- Provide value-added products to customers in all markets served through leading technology and innovation;
- Utilize leading technology resources to develop advanced and innovative products, processes and manufacturing capabilities;
- Expand coverage in existing product lines and add new product lines which are critical to maintaining leadership position;
- Continue to invest in product innovation to support premium brands and to enhance marketing initiatives to more effectively communicate the value proposition of branded products to end customers;
- Aggressively pursue cost competitiveness by continuing to drive productivity in operations and rationalizing business resources and infrastructure.

Review of the business

The Company is engaged in the manufacture and distribution of automotive components for original equipment ("OE") manufacturers. The operations are spread over four separate sites within the UK. In addition, it holds a number of overseas investments indirectly through a number of UK subsidiary holding companies.

The Company considers turnover and operational EBITDA to be its key financial performance indicators. EBITDA is a non-GAAP measure defined to exclude impairment charges, restructuring costs, corporation tax expense, income from shares in group undertakings, interest expense and income, depreciation and amortisation.

Turnover for the year was £123,027,213 compared with £112,582,074 in 2018, an increase of £10,445,139. The most significant factor for the increase in turnover was a growth in demand for certain of the Company's products and it was also helped by price increases. However, this increase was offset by a fall in demand for the Company's piston pin products.

EBITDA for the year was £10,594,908 compared with £7,345,103 in 2018, a net increase of £3,249,805. This was due to an increase of over £3,900,000 (after adding back depreciation) in gross margin which was mainly driven by the increase in turnover. However, EBITDA was adversely affected by operating expenses which increased by £727,263 primarily due to an increase in foreign exchange losses of £583,221 and also by a reduction in royalties receivable of £585,350 due to various circumstances including unfavourable exchange rates and a reduction in sales of the licensees due to local market conditions.

In July 2019 the Company made an investment of £7,000,000 in one of its subsidiary undertakings, Federal-Mogul Controlled Power Limited.

Following a review of the carrying value of investments, a provision of £7,000,000 was made against the Company's investments in subsidiary undertakings (2018: £1,000,000).

Calculation of representative non-financial KPIs is not appropriate at this legal entity level given the global structure of the overall group.

The directors consider that the year end financial position of the Company was satisfactory.

Acquisition by Tenneco

On 1 October 2018, Tenneco Inc. acquired Federal-Mogul LLC, the lead company of the Federal-Mogul Group and became the Company's ultimate holding company. The change in ownership has had no impact on the Company or its subsidiaries.

Section 172 statement

The directors of the Company set out below how they have performed their individual and collective duty, whilst acting in good faith, under Section 172 of the Companies Act 2006, in promoting the success of the Company for the benefit of its members as a whole, encompassing all stakeholder interests.

During the year there were no long-term strategy decisions made by the Board which would affect its stakeholders.

The employees and the Company work in partnership to build and sustain the business for mutual benefit. Employees and their interests are at the heart of any decision making by the Company.

As a member of a large multi-national group some of our products are linked with those of other group companies throughout the world. Our suppliers and customers benefit from the consistent approach throughout the group, trusted relationships have been built with our customers and suppliers to ensure benefits for all parties and stakeholders. The board also relies on local management at its UK sites to create and ensure a positive and constructive relationship with customers and suppliers.

The Company manages its environmental responsibilities through its commitment to follow both local and group environmental requirements and laws. It instigates best practice for preventing pollution, reducing waste and achieving energy efficiency.

One of the main decisions of the Board during the year was to invest in one of its subsidiary companies. This particular company's purpose is to improve the environmental impact of the automotive engine by developing powertrain technologies for electrification and hybridisation.

The Company's shareholder is fully aligned with the strategy and aims of the Company. All decisions taken by the board of directors during the year have been fully supported by its parent.

Going concern

During 2020 there has been a worldwide pandemic caused by a novel coronavirus (SARS-CoV-2). As the virus was not identified at 31 December 2019, the date at which these accounts are prepared, it is a non-adjusting subsequent event. However, the directors have considered the potential consequences of this pandemic, and have concluded that it is unlikely to have a long-term effect on the Company's subsidiaries and also that it will have no significant long-term effect, if any, on the Company itself nor its ability to continue as a going concern.

Principal risks and uncertainties

Aside from any uncertainty related to the current pandemic, the principal risks and uncertainties that the Company faces are:

Adverse conditions in the automotive market

The revenues of the Company's operations are closely tied to global OE vehicle sales, production levels, and independent aftermarket parts replacement activity. The OE market is characterised by short-term volatility, with overall expected long-term growth in global vehicle sales and production. Automotive production in the local markets served by the Company can be affected by macro-economic factors such as interest rates, fuel prices, consumer confidence and employment trends. A variation in the level of vehicle production would not only affect sales to OE customers but, depending on the reasons for the change, could impact demand from aftermarket customers. The Company's results of operations and financial position could be adversely affected if the Company fails to respond in a timely and appropriate manner to changes in the demand for its products.

Competitiveness of automotive industry

The Company operates in an extremely competitive industry, driven by global vehicle production volumes and part replacement trends. Business is typically awarded to the supplier offering the most favourable combination of cost, quality, technology and service. In addition, customers continue to require periodic price reductions that require the Company to continually assess, redefine and improve its operations, products and manufacturing capabilities to maintain and improve profitability. Furthermore, the Company's competitors' efforts to increase their market share could exert additional downwards pressure on product pricing and margins. The Company's management continues to develop and execute initiatives to meet the challenges of the industry, however, there can be no assurance that the Company will be able to compete effectively in the automotive market.

Brexit

The United Kingdom referendum vote to leave the European Union naturally introduced new uncertainties into an already challenging marketplace. In the short-term, this has led to economic uncertainty. The directors continue to monitor and consider Brexit developments. The United Kingdom left the European Union on the 31 January 2020, however there is a transition period which lasts until 31 December 2020, during which existing rules will still apply. Despite the end of that period approaching, the terms under which the UK and EU will function after that point are not yet agreed, consequently the directors cannot ascertain the effect of those arrangements on the Company. However, at this moment in time, taking into account the activities of the Company, the directors have no reason to think that the going concern assumption will be affected.

Currency fluctuations

The Company is exposed to a risk of gain or loss from changes in foreign exchange rates whenever the Company enters into a purchase, sales or intra-group loan agreement in a currency other than sterling. The Company is a member of a multi-national group and it is group policy not to hedge currency exposure whether it is on intra-group transactions or third party transactions.

New Technologies

Increased fuel economy and decreased vehicle emissions are of great importance to OEMs as legislators and customers continue to demand more efficient and cleaner operating vehicles. Increasingly stringent fuel economy standards and environmental regulations are driving OEMs to focus on new technologies including downsized, higher output and turbocharged petrol engines, diesel and turbocharged diesel, bio-mass and hybrid diesel applications and hybrid, electric and alternative energy engines. Also, vehicle safety continues to receive industry attention by OEMs since customers view safety as a fundamental driver in consumer purchasing decisions and legislation looks on improved vehicle safety as a public health issue. The Company strives to ensure that its products meet the requirements of these new technologies and continually develops leading edge technologies, both in respect of product and process, to allow the Company to remain competitive and to continually strive for market leadership.

Federal-Mogul Limited

Company Number 163992

Strategic Report for the year ended 31 December 2019 (continued)

Principal risks and uncertainties (continued)

Raw material cost fluctuations

In recent periods there have been significant fluctuations in the prices of raw materials and energy which have had and may continue to have an unfavourable impact on the Company's business. Competitive and marketing pressures may limit the Company's ability to pass some of the material cost increases on to the Company's customers. Furthermore, the Company's customers are generally not obligated to accept price increases that the Company may desire to pass along to them. This inability to pass on price increases to customers when material prices increase rapidly or to a significantly higher than historic levels could adversely affect the Company's operating margins and cash flow, possibly resulting in lower operating income and profitability.

Treasury Policies

Financial Instruments

The Company's financial instruments comprise cash at bank, balances with group undertakings and trade debtors and creditors arising from normal operations. These financial instruments are used to fund the Company's operations. It is Company policy that no trading in financial instruments be undertaken.

Interest Rate Risk

There are no bank borrowings so interest rate risk arises only from those intra-group loans which bear interest. A number of these loans carry interest at a floating rate since the rate is linked to bank base rate. However, no specific action is taken to hedge the corresponding interest rate exposure since there is minimal risk to the Group as a whole.

Foreign currency risk

As a member of a multi-national group, the Company does not hedge currency exposure. It is not considered appropriate to do so in connection with intra-group loans or intra-group trading and exposure to risk relating to third party export sales is mitigated by the level of purchases from overseas suppliers denominated in the same currency. Foreign currency is held for only short periods, the general policy being to convert all cash transactions to sterling as soon as possible.

Credit Risk

The Company's objective is to reduce the risk of financial loss due to a counterparty's failure to honour its obligations. This is achieved by each operating division being responsible for assessing the credit risk associated with accepting production schedules from customers and for managing shipments and receivables within pre-determined credit limits. Similarly, in respect of intra-group loans resulting from Federal-Mogul Group's policy to use cash surpluses in one area of the business to meet funding requirements in another, credit risk is assessed by a central treasury department.

Liquidity Risk

The Company aims to mitigate liquidity risk by managing cash generation by its operations. Formal approval procedures apply within each operating unit in respect of capital expenditure and cash flow is managed through regular forecasting and management review of operating results at all levels of the company.

On behalf of the Board

E. J. Milner
Director
Date: 16 December 2020

Federal-Mogul Limited

Company Number 163992

Directors' Report for the year ended 31 December 2019

The directors of Federal-Mogul Limited ("the Company") present their annual report for the year ended 31 December 2019 together with the audited financial statements for the year.

Results and dividends

The profit for the year after tax was £4,640,654 (2018 profit: £9,030,674), a decrease of £4,390,020. The Company made provisions against investments of £7,000,000 (2018: £1,000,000) and a provision against a doubtful intercompany debt of £6,239,506 (2018: £4,308,424). During the year the Company paid several interim dividends amounting to £78,841,745 to its parent, Federal-Mogul Global Growth Limited (2018: Interim £30,000,000). No final dividend is proposed (2018: £nil).

Principal activities

The principal activity of the Company continued to be the manufacture and distribution of automotive components for original equipment ("OE") manufacturers.

Looking ahead

The Company will continue its strive to meet changing customer requirements to ensure it wins new business arising from the customers' new vehicle programmes.

The Company will also continue its attempts to obtain efficiencies in relation to both the manufacturing processes and also the costs associated with those processes.

Research and development

The research and development activities of the Company continue to be directed principally towards the development of new products and to improving the performance and effectiveness of existing products. In 2019 expenditure amounted to £404,000 (2018: £463,989).

Post balance sheet events

During 2020 there has been a worldwide pandemic caused by a novel coronavirus (SARS-CoV-2). As the virus was not identified at 31 December 2019, the date at which these accounts are prepared, it is a non-adjusting subsequent event. However, the directors have considered the potential consequences of this pandemic, and have concluded that it is unlikely to have a long-term effect on the Company's subsidiaries and also that it will have no significant long-term effect, if any, on the Company itself nor its ability to continue as a going concern.

On 30 November 2020 the Company sold all of the fixed assets of its piston pins business. The directors consider this to be a non-adjusting subsequent event.

In April 2020 the Company made an investment of £15,000,000 in one of its subsidiary undertakings, Federal-Mogul Controlled Power Limited.

In October 2020 the Company made an investment of £5,000,000 in one of its subsidiary undertakings, Federal-Mogul Controlled Power Limited.

In October 2020 the Company received a dividend of £16,449,353 from one of its subsidiary undertakings, FDML Holdings Limited.

In October 2020 the Company paid a dividend to its parent undertaking of £11,574,114.

Federal-Mogul Limited

Company Number 163992

Directors' Report for the year ended 31 December 2019 (continued)

Directors

The following served as directors of Federal-Mogul Limited during the year:

E. J. Milner
C. Narten

Employees and employment policies

The Company has 503 employees located in the UK.

It is the Company's policy to provide equal opportunities to all employees. The Company provides appropriate training at all levels and is committed to helping employees to develop their full potential by gaining relevant skills and experience.

Full and fair consideration is given to applications for employment made by disabled persons. Employees who become disabled will be retained in employment wherever possible and, where necessary, appropriate retraining will be provided.

The Company places considerable emphasis on regular and effective communications with employees on matters of concern to them. The Company involves and consults employees on matters concerning its performance.

Business relationships with suppliers, customers and others

The Company is a member of a large multi-national group and some of our products are linked with those of other group companies throughout the world. Our suppliers and customers benefit from a consistent approach throughout the group, trusted relationships have been built with our customers and suppliers to ensure benefits for all parties and stakeholders. The board also relies on local management at its UK sites to create and ensure a positive and constructive relationship with customers and suppliers,

Directors Indemnities

The Company maintained throughout the year and at the date of approval of the financial statements, liability insurance for its directors and officers, this is a qualifying provision for the purposes of the Companies Act 2006.

Disclosure of information to auditors

In accordance with s.418(2) of the Companies Act 2006 the directors:

- are not aware of any relevant audit information of which the Company's auditors are unaware; and
- have taken all the steps that they ought to have taken as a director in order to make themselves aware of any relevant audit information and to establish that the Company's auditors are aware of that information.

On behalf of the Board

E. J. Milner
Director
Date: 16 **December 2020**

Federal-Mogul Limited

Statement of directors' responsibilities

The directors are responsible for preparing the Strategic Report and Directors' Report, and the financial statements in accordance with applicable law and regulations.

Company law requires the directors to prepare financial statements for each financial year. Under that law the directors have elected to prepare the financial statements in accordance with United Kingdom Generally Accepted Accounting Practice (United Kingdom Accounting Standards and applicable law), including FRS102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland'. Under company law the directors must not approve the financial statements unless they are satisfied that they give a true and fair view of the state of affairs of the Company and of the profit or loss of the Company for that period. In preparing those financial statements, the directors are required to:

- select suitable accounting policies and then apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- state whether applicable UK Accounting Standards have been followed, subject to any material departures disclosed and explained in the financial statements;
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Company will continue in business.

The directors are responsible for keeping adequate accounting records that are sufficient to show and explain the Company's transactions and disclose with reasonable accuracy at any time the financial position of the Company and enable them to ensure that the financial statements comply with the Companies Act 2006. They are also responsible for safeguarding the assets of the Company and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF FEDERAL-MOGUL LIMITED

Opinion

We have audited the financial statements of Federal-Mogul Limited (the 'Company') for the year ended 31 December 2019, which comprise the Profit and Loss Account, the Balance Sheet, the Statement of Changes in Equity and notes to the financial statements, including a summary of significant accounting policies. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards, including Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' (United Kingdom Generally Accepted Accounting Practice).

In our opinion, the financial statements:

- give a true and fair view of the state of the Company's affairs as at 31 December 2019 and of its profit for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Companies Act 2006.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the 'Auditor's responsibilities for the audit of the financial statements' section of our report. We are independent of the Company in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the FRC's Ethical Standard, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

The impact of macro-economic uncertainties on our audit

Our audit of the financial statements requires us to obtain an understanding of all relevant uncertainties, including those arising as a consequence of the effects of macro-economic uncertainties such as Covid-19 and Brexit. All audits assess and challenge the reasonableness of estimates made by the directors and the related disclosures and the appropriateness of the going concern basis of preparation of the financial statements. All of these depend on assessments of the future economic environment and the Company's future prospects and performance.

Covid-19 and Brexit are amongst the most significant economic events currently faced by the UK, and at the date of this report their effects are subject to unprecedented levels of uncertainty, with the full range of possible outcomes and their impacts unknown. We applied a standardised firm-wide approach in response to these uncertainties when assessing the Company's future prospects and performance. However, no audit should be expected to predict the unknowable factors or all possible future implications for a Company associated with these particular events.

Conclusions relating to going concern

We have nothing to report in respect of the following matters in relation to which the ISAs (UK) require us to report to you where:

- the directors' use of the going concern basis of accounting in the preparation of the financial statements is not appropriate; or

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF FEDERAL-MOGUL LIMITED (continued)

Conclusions relating to going concern (continued)

- the directors have not disclosed in the financial statements any identified material uncertainties that may cast significant doubt about the Company's ability to continue to adopt the going concern basis of accounting for a period of at least twelve months from the date when the financial statements are authorised for issue.

In our evaluation of the directors' conclusions, we considered the risks associated with the Company's business, including effects arising from macro-economic uncertainties such as Covid-19 and Brexit, and analysed how those risks might affect the Company's financial resources or ability to continue operations over the period of at least twelve months from the date when the financial statements are authorised for issue. In accordance with the above, we have nothing to report in these respects.

However, as we cannot predict all future events or conditions and as subsequent events may result in outcomes that are inconsistent with judgements that were reasonable at the time they were made, the absence of reference to a material uncertainty in this auditor's report is not a guarantee that the Company will continue in operation.

Other information

The directors are responsible for the other information. The other information comprises the information included in the Strategic Report and Directors' Report, other than the financial statements and our auditor's report thereon. Our opinion on the financial statements does not cover the other information and, except to the extent otherwise explicitly stated in our report, we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether there is a material misstatement in the financial statements or a material misstatement of the other information. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact.
We have nothing to report in this regard.

Opinions on other matters prescribed by the Companies Act 2006

In our opinion, based on the work undertaken in the course of the audit:

- the information given in the Strategic Report and the Directors' Report for the financial year for which the financial statements are prepared is consistent with the financial statements; and
- the Strategic Report and the Directors' Report have been prepared in accordance with applicable legal requirements.

Matter on which we are required to report under the Companies Act 2006

In the light of the knowledge and understanding of the Company and its environment obtained in the course of the audit, we have not identified material misstatements in the Strategic Report or the Directors' Report.

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF FEDERAL-MOGUL LIMITED (continued)

Matters on which we are required to report by exception

We have nothing to report in respect of the following matters in relation to which the Companies Act 2006 requires us to report to you if, in our opinion:

- adequate accounting records have not been kept, or returns adequate for our audit have not been received from branches not visited by us; or
- the financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of directors' remuneration specified by law are not made; or
- we have not received all the information and explanations we require for our audit.

Responsibilities of directors for the financial statements

As explained more fully in the directors' responsibilities statement set out on page 7, the directors are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the directors determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the directors are responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the Company or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

A further description of our responsibilities for the audit of the financial statements is located on the Financial Reporting Council's website at: www.frc.org.uk/auditorsresponsibilities. This description forms part of our auditor's report.

Use of our report

This report is made solely to the Company's members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the Company's members those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the Company and the Company's members as a body, for our audit work, for this report, or for the opinions we have formed.

Grant Thornton UK LLP

Stuart Muskett
Senior Statutory Auditor
for and on behalf of Grant Thornton UK LLP
Statutory Auditor, Chartered Accountants
Manchester
Date 16 December 2020

Federal-Mogul Limited

Profit and loss account for the year ended 31 December 2019

	Notes	2019	2018
		£	£
Total Turnover	5	123,027,213	112,582,074
Cost of sales		(114,275,887)	(107,786,221)
Gross profit		8,751,326	4,795,853
Other operating expenses	6(a)	(6,646,751)	(6,389,059)
Other operating income	6(b)	3,621,411	4,241,427
Provisions against fixed asset investments and similar items	6(c)	(13,239,506)	(5,308,424)
Operating loss on ordinary activities		(7,513,520)	(2,660,203)
Income from shares in group undertakings		3,003,000	-
Net interest receivable	7	12,650,371	12,750,886
Profit on ordinary activities before taxation	6(c)	8,139,851	10,090,683
Tax on profit on ordinary activities	8	(3,499,197)	(1,060,009)
Profit on ordinary activities after taxation		4,640,654	9,030,674
Profit attributable to shareholders		4,640,654	9,030,674

The results above all relate to continuing operations.

Federal-Mogul Limited

Balance sheet as at 31 December 2019

	Notes	2019 £	2018 £
Fixed assets			
Intangible fixed assets	13	1,219,766	2,195,580
Tangible fixed assets	14	22,705,389	22,687,975
Investments	15	453,265,159	453,265,159
		477,190,314	478,148,714
Current assets			
Stocks	16	5,825,791	6,562,977
Debtors falling due within one year	17	32,778,100	90,633,068
Debtors falling due after more than one year	17	173,123,850	174,790,850
		205,901,950	265,423,918
Cash at bank and in hand		6,690,636	19,472,011
		218,418,377	291,458,906
Creditors: Amounts falling due within one year	18	(32,487,472)	(32,285,311)
Net current assets		185,930,905	259,173,595
Total assets less current liabilities		663,121,219	737,322,309
Net assets		663,121,219	737,322,309
Capital and reserves:			
Called up share capital	19	271,492,951	271,492,951
Share premium account	20	129,482,022	129,482,022
Profit and loss account	20	262,146,246	336,347,336
Shareholders' funds - equity		663,121,219	737,322,309

The financial statements on pages 10 to 26 were approved by the Board on 16 December 2020 and signed on its behalf by:

E.J.Milner
Director

Federal-Mogul Limited

Statement of changes in equity

	Notes	Called-up share capital £	Share premium account £	Profit and loss account £	Total £
At 1 January 2018		271,492,951	129,482,022	357,316,662	758,291,635
Comprehensive income for the year					
Profit for the year		-	-	9,030,674	9,030,674
Total comprehensive income for the year		-	-	**9,030,674**	**9,030,674**
Contributions by and distributions to owners					
Dividends paid	9	-	-	(30,000,000)	(30,000,000)
Total transactions with owners		-	-	**(30,000,000)**	**(30,000,000)**
At 31 December 2018		**271,492,951**	**129,482,022**	**336,347,336**	**737,322,309**
Profit for the year		-	-	4,640,654	4,640,654
Total comprehensive income for the year		-	-	4,640,654	4,640,654
Contributions by and distributions to owners					
Dividends paid	9	-	-	(78,841,744)	(78,841,744)
Total transactions with owners		-	-	(78,841,744)	(78,841,744)
At 31 December 2019		**271,492,951**	**129,482,022**	**262,146,246**	**663,121,219**

Federal-Mogul Limited

Notes to the financial statements for the year ended 31 December 2019

1. Company Information

Federal-Mogul Limited is a limited liability company incorporated in England and Wales. Its registered office is at Manchester International Office Centre, Styal Road, Manchester M22 5TN.

2. Basis of preparation

These financial statements have been prepared in accordance with applicable United Kingdom accounting standards including Financial Reporting Standard 102, "The Financial Reporting Standard applicable in the United Kingdom and Republic of Ireland" ("FRS102") and with the Companies Act 2006. The financial statements have been prepared on the historical cost basis.

The financial statements are presented in Sterling (£) (the Company's functional currency).

Until 30 September 2018, the Company's ultimate parent undertaking was Icahn Enterprises L.P., and from 1 October 2018 its ultimate parent has been Tenneco Inc. Both Icahn Enterprises L.P. and Tenneco Inc are incorporated in the USA and listed on the New York Stock Exchange. The Company was included in the consolidated financial statements of Icahn Enterprises L.P. until 30 September 2018 and in the consolidated financial statements of Tenneco Inc since 1 October 2018. Consolidated financial statements of the ultimate parent entities are available from their websites www.ielp.com and www.tenneco.com respectively. Consequently, the Company has taken advantage of the exemptions available, under the terms of FRS102, from preparing a cash flow statement and from disclosures in relation to financial instruments.

As stated above, the Company and all of its subsidiary undertakings are included in the consolidated financial statements of Icahn Enterprises L.P. to 30 September 2018 and in the consolidated financial statements of Tenneco Inc from 1 October 2018. The ultimate parent company accounts are drawn up to the same date in the same financial year and in accordance with the provisions of the Seventh Directive (83/349/EEC) or in a manner equivalent to consolidated accounts and consolidated annual reports so drawn up. Accordingly, the Company, in accordance with the exemption in s.401 of the Companies Act, has not prepared consolidated financial statements. The financial statements therefore contain information about Federal-Mogul Limited as an individual company and not as a group.

The directors believe it to be appropriate to prepare the financial statements on the going concern basis and that the Coronavirus (COVID-19) pandemic will have no significant long-term effect, if any, on the Company nor its ability to continue as a going concern.

3. Significant judgements and estimates

Impairment review of fixed asset investments

The most significant judgement made in the preparation of these financial statements is the impairment review of the Company's fixed asset investments where the carrying value of investments has been compared to their value in use and an impairment charge recorded where individual investments are considered to be impaired.

The value in use is derived from discounted future cash flow projections using nominal discount rates consistent with each applicable global industry sector. A material adjustment could occur if the actual cash flows were significantly different from those used in the impairment review.

As at 31st December 2019 the carrying amounts of the fixed asset investments are:

Subsidiary Undertakings-Shares	£453,164,909
Subsidiary Undertakings-Loans	£100,250

Deferred tax assets

The judgement made in relation to deferred tax assets is that they are recognised to the extent that they will be recoverable out of future taxable profits based on forecasts for the next three years.

4. Principal accounting policies

The principal accounting policies of the Company have remained unchanged from the prior year and are set out below.

Tangible assets

Tangible fixed assets are stated at cost less accumulated depreciation and accumulated impairment losses.

Depreciation is provided on cost to write tangible fixed assets, other than freehold land and construction in progress, down to their estimated residual values on a straight line basis as follows:

- Freehold buildings, 2.5% per annum.
- Leasehold buildings are assumed to have a life equal to the period of the lease, but with a maximum of 40 years.
- Plant and machinery, at rates ranging from 7% to 33% per annum.

The assets' residual values, useful lives and depreciation methods are reviewed, and adjusted prospectively if appropriate.

The carrying values of tangible fixed assets are reviewed for impairment when events or changes in circumstances indicate the carrying value may not be recoverable.

Intangible fixed assets

Intangible assets are measured at cost less accumulated amortisation and any accumulated impairment losses.

Goodwill

Goodwill relating to the purchase of a business is capitalised at cost and amortised on a straight line basis over three years, the expected period of the initial supply contract.

Trademarks

Trademarks are capitalised at cost and amortised over their expected useful economic life using the straight line method. The useful economic life is considered to be ten years. Their carrying values are reviewed annually to determine whether there has been any permanent impairment in value and any such reductions in value are taken to the profit and loss account.

Investments

Fixed asset investments are stated at cost less provision for any impairment.

Impairment of assets

At each reporting date fixed assets are reviewed to determine whether there is any indication that those assets have suffered an impairment loss. If there is an indication of possible impairment, the recoverable amount of any affected asset is estimated and compared with its carrying amount. If the estimated recoverable amount is lower, the carrying amount is reduced to its estimated recoverable amount and an impairment loss is recognised immediately in profit or loss.

If an impairment loss subsequently reverses, the carrying amount of the asset is increased to the revised estimate of its recoverable amount, but not in excess of the amount that would have been determined had no impairment loss been recognised for the asset in prior years. A reversal of an impairment loss is recognised immediately in profit or loss.

4. Principal accounting policies (continued)

Stocks

Stocks are stated at the lower of original cost and net realisable value on a first-in first-out basis. Cost comprises materials, labour and an allocation of attributable overhead expenses. Net realisable value is the price at which stocks can be sold in the normal course of business after allowing for the costs of realisation.

Debtors

Short term debtors are measured at transaction price, less any impairment.

Creditors

Short term creditors are measured at the transaction price.

Taxation

Current tax is recognised for the amount of income tax payable in respect of the taxable profit for the current or past reporting periods using the tax rates and laws that have been enacted or substantively enacted by the reporting date.

Deferred tax is recognised in respect of all timing differences at the reporting date, except as otherwise indicated.

Deferred tax assets are only recognised to the extent that it is probable that they will be recovered against the reversal of deferred tax liabilities or other future taxable profits.

If and when all conditions for retaining tax allowances for the cost of a fixed asset have been met, the deferred tax is reversed.

A deferred tax liability or asset is recognised for the additional tax that will be paid or avoided in respect of assets and liabilities that are recognised in a business combination. The amount attributed to goodwill is adjusted by the amount of deferred tax recognised.

Deferred tax is calculated using the tax rates and laws that have been enacted or substantively enacted by the reporting date that are expected to apply to the reversal of the timing difference.

With the exception of changes arising on the initial recognition of a business combination, the tax expense (income) is presented either in profit or loss, other comprehensive income or equity depending on the transaction that resulted in the tax expense (income).

Deferred tax liabilities are presented within provisions for liabilities and deferred tax assets within debtors.

Deferred tax assets and deferred tax liabilities are offset only if:

- the group has a legally enforceable right to set off current tax assets against current tax liabilities, and,
- the deferred tax assets and deferred tax liabilities relate to income taxes levied by the same taxation authority on either the same taxable entity or different taxable entities which intend either to settle current tax liabilities and assets on a net basis, or to realise the assets and settle the liabilities simultaneously.

4. Principal accounting policies (continued)

Foreign currencies

Transactions in foreign currency are recorded at the rate ruling at the date of transaction. At the end of each reporting period monetary items denominated in foreign currencies are retranslated at the rate prevailing at that date. Exchange differences are recognised in the profit and loss account in the period in which they arise.

Leasing

Rentals payable under operating leases are charged to the profit and loss account on a straight line basis over the lease term.

The aggregate benefit of lease incentives are recognised as a reduction to the expense recognised over the lease term on a straight line basis.

Pensions Costs

The Company operates a defined contribution scheme in the form of a stakeholder plan. Contributions to this scheme are recognised in the profit and loss account in the period in which they become payable.

Further information on pension arrangements is set out in Note 11 to the accounts.

Revenue Recognition

Revenue is recognised to the extent that the Company obtains the right to consideration in exchange for its performance. Revenue is measured at the fair value of the consideration received or receivable, excluding discounts, rebates, VAT and other sales taxes or duty. The following criteria must also be met before revenue is recognised:

Sale of goods

Revenue from the sale of goods is recognised when the significant risks and rewards of ownership of the goods have passed to the buyer, usually on dispatch of the goods.

Royalty income

Revenue is recognised as royalties accrue.

Interest income

Revenue is recognised as interest accrues.

5. Turnover

Turnover, analysed geographically between markets, was as follows:

	2019 £	2018 £
UK	57,195,436	48,480,277
Europe, Middle East and Africa	41,808,874	39,975,716
North America	9,739,162	12,140,435
Rest of world	14,283,741	11,985,646
	123,027,213	112,582,074

Turnover arises on the sale of a range of automotive components which represent a single stream of turnover. Accordingly, no further disclosure is deemed necessary.

6. Analysis of results

(a) Other operating expenses	2019 £	2018 £
Distribution costs	1,113,859	1,054,027
Administrative expenses	5,532,892	5,335,032
Other operating expenses	6,646,751	6,389,059

Costs of operations charged in arriving at operating profit include £352,361 (2018:£210,695) in respect of redundancy and rationalisation. £nil of these costs (2018:£nil) have been charged as cost of sales and £352,361 (2018:£210,695) as administration expenses.

(b) Other operating income	2019 £	2018 £
Royalty income	3,606,101	4,191,451
Other income	15,310	49,976
	3,621,411	4,241,427

(c) Profit before taxation is stated after charging/(crediting):	2019 £	2018 £
Auditor's remuneration		
- Audit of company financial statements	41,754	30,750
- Audit of UK subsidiary companies	54,876	43,070
Research and development	404,000	463,989
R&D Expenditure Credits	(469,571)	(55,679)
Amortisation of intangible fixed assets	975,814	975,814
Depreciation of tangible fixed assets		
- owned assets	3,540,747	3,510,372
Provision against fixed asset investments	7,000,000	1,000,000
Provision against intercompany loan receivables	6,239,506	4,308,424
Operating lease rentals	468,887	474,909
Loss on foreign exchange movements	645,755	62,534

The auditors of the Company also received audit fees for auditing the accounts of the Company's overseas subsidiary undertakings of £284,884 (2018: £208,125).

7. Net interest receivable	2019 £	2018 £
Interest receivable on group loans	12,387,366	12,346,639
Interest receivable on deposits	259,511	396,372
Other	3,494	7,875
	12,650,371	12,750,886

8. Tax on profit on ordinary activities

	2019	2018
(a) Analysis of tax charge/(credit) in the year	**£**	**£**
Current tax:		
UK corporation tax on profits for the period	161,925	842,389
Adjustments in respect of previous periods	17,151	-
Foreign tax relief/other relief	(161,925)	(234,703)
	17,151	589,686
Foreign tax suffered	165,478	234703
Total Current Tax	182,629	824,389
Deferred tax: (note 21)		
Origination and reversal of timing differences	4,114,989	263,341
Adjustment in respect of previous periods	(365,264)	-
Effect of changes in tax rates	(433,157)	(27,721)
Total Deferred Tax	3,316,568	235,620
Tax on profit on ordinary activities	3,499,197	1,060,009

(b) Factors affecting tax (credit) / charge for the year

The tax assessed on the profit on ordinary activities for the year is lower (2018: lower) than the standard rate of corporation tax in the UK of 19% (2018: 19%). The differences are explained below:

	2019	2018
	£	**£**
Profit on ordinary activities before taxation	8,139,851	10,090,683
Profit on ordinary activities before taxation multiplied by the standard rate of corporation tax in the UK of 19% (2018: 19%)	1,546,572	1,917,230
Effect of:		
Expenses not deductible for tax purposes	2,700,911	1,195,527
Income not taxable	(647,416)	-
Movement on deferred tax unrecognised	1,908,715	(3,655,827)
Foreign tax	3,553	-
UK: UK transfer pricing adjustment	109,131	281,873
Group relief claimed for nil consideration	(1,340,999)	(447,059)
Gains transferred in	-	1,551,390
Tax rate changes	(433,157)	216,875
Adjustment from previous periods	(348,113)	-
Tax on profit on ordinary activities	3,499,197	1,060,009

8. Tax on profit on ordinary activities (continued)

(c) Factors that may affect future tax charges

The Company has unrestricted capital losses available for carry forward of £96,817,356 (2018: £95,161,743).

No deferred tax has been provided for tax that may become payable if revalued assets are disposed of at their revalued amounts.

The Finance Bill 2020, which received Royal Assent on 22 July 2020 and became the Finance Act 2020, maintained the Corporation Tax main rate at 19% for the financial year beginning 1 April 2020.

9. Dividends	**2019**	**2018**
	£	**£**
Paid during year	78,841,744	30,000,000

10. Employees	**2019**	**2018**
Monthly average number of employees	**No.**	**No.**
Manufacturing	405	432
Selling and Marketing	9	10
Research and Development	6	6
Administrative	110	124
	530	572

	2019	**2018**
Employment costs	**£**	**£**
Wages and salaries	19,849,083	21,005,571
Social security costs	2,176,669	2,284,695
Net pension charge (Note 11)	2,538,091	2,563,949
Redundancy payments	352,361	210,695
	24,916,204	26,064,910

11. Pensions commitments

	2019	2018
	£	£
Defined contribution scheme	2,538,091	2,563,949

The Company operates a defined contribution scheme in the form of a stakeholder plan.

As at 31 December 2019 outstanding employer contributions of £173,550 (2018: £231,386) were included in Creditors – Amounts falling due within one year.

There are no other significant post-employment benefits.

12. Directors' emoluments

The directors of the Company have not received any emoluments in respect of their services as a director of the Company (2018: £nil).

13. Intangible fixed assets	Trademarks
	£
Cost	
At 1 January 2019	9,758,138
At 31 December 2019	9,758,138
Amortisation	
At 1 January 2019	7,562,558
Charge for the year	975,814
At 31 December 2019	8,538,372
Net book value	
At 31 December 2019	1,219,766
At 31 December 2018	2,195,580

Trademarks

On 29 March 2011 F-M Trademarks Limited assigned all rights, title and interest in the Goetze family of trademarks to the Company as of 1 April 2011. The consideration for the assignment was £9,758,138.

The trademarks are capitalised at cost and amortised evenly over 10 years. Their carrying values are reviewed annually to determine whether there has been any impairment and any such reductions in value are taken to the profit and loss account.

14. Tangible fixed assets	**Land and buildings £**	**Plant and machinery £**	**Total £**
Cost			
At 1 January 2019	6,914,323	86,322,923	93,237,246
Additions	7,450	3,584,624	3,592,074
Disposals	-	(1,177,689)	(1,177,689)
At 31 December 2019	6,921,773	88,729,858	95,651,631
Depreciation			
At 1 January 2019	4,579,090	65,970,181	70,549,271
Disposals	-	(1,143,776)	(1,143,776)
Charge for the year	106,462	3,434,285	3,540,747
At 31 December 2019	4,685,552	68,260,690	72,946,242
Net book value			
At 31 December 2019	2,236,221	20,469,168	22,705,389
At 31 December 2018	2,335,233	20,352,742	22,687,975

Included in the cost of fixed assets are plant and machinery in the course of construction £1,802,764 (2018: £3,883,529). Assets in the course of construction are not depreciated.

Net book value of land and buildings	2019 £	2018 £
Freehold land – not depreciated	1,187,502	1,187,502
Freehold buildings	1,048,719	1,147,731
Short leasehold	-	-
	2,236,221	2,335,233

15. Fixed asset investments

	Subsidiary Undertakings Shares £	Subsidiary Undertakings Loans £	Total £
Cost			
At 1 January 2019	474,712,665	100,250	474,812,915
Addition	7,000,000	-	7,000,000
At 31 December 2019	481,712,665	100,250	481,812,915
Provisions			
At 1 January 2019	21,547,756	-	21,547,756
Provision charged	7,000,000	-	7,000,000
At 31 December 2019	28,547,756	-	28,547,756
Net book value			
At 31 December 2019	453,164,909	100,250	453,265,159
At 31 December 2018	453,164,909	100,250	453,265,159

Name of Company	Registered office	Holding	Proportion of voting rights and shares held %	Nature of business
FDML Holdings Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Holding company
Federal-Mogul Coventry Limited +	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Powder Metal Products
Federal-Mogul Bradford Limited +	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Powertrain
Piston Rings (UK) Limited +	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Distribution of piston rings
Federal-Mogul Controlled Power Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Hybridization applications
Federal-Mogul Employee Trust Administration Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Administration of a life insurance agreement
Leeds Piston Ring & Engineering Co Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Non-trading
Federal-Mogul Engineering Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Dormant
Federal-Mogul Technology Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Dormant
F-M Trademarks Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Dormant
AE Group Machines Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Dormant
Sintration Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Dormant
Wellworthy Limited	Suite 14, Manchester International Office Centre, Styal Road, Manchester M22 5TN	Ordinary shares	100	Dormant

+ These companies operate as a managing agent of Federal-Mogul Limited.

15. Fixed asset investments (continued)

In July 2019 the Company made an investment of £7,000,000 in one of its subsidiary undertakings, Federal-Mogul Controlled Power Limited.

In accordance with FRS102, the directors have compared the carrying value of investments to their value in use to the Company and recorded an impairment charge for any individual investments that they considered impaired, consequently a charge of £7,000,000 has been made in the profit and loss account in the current year (2018:£1,000,000).

The value in use has been derived from discounted cash flow projections using nominal discount rates consistent with each applicable global industry sector, ranging from 11.25% to 13.5% (2018: 12.0% to 12.75%) on a pre-tax basis. A long-term growth rate ranging from 1.50% to 3.0% (2018: 2.75% to 3.5%) has been assumed.

16. Stocks	**2019**	**2018**
	£	**£**
Raw materials	396,940	440,238
Work in progress	1,948,872	1,904,440
Finished goods	3,479,979	4,218,299
	5,825,791	6,562,977

An impairment loss of £338,865 (2018: £261,029) was recognised in cost of sales during the year due to slow-moving, damaged and obsolete stock.

17. Debtors	**2019**	**2018**
Debtors falling due within one year	**£**	**£**
Trade debtors	19,284,491	16,463,970
Amounts owed by fellow subsidiaries	9,487,688	68,246,177
Taxation – United Kingdom Corporation Tax	-	-
Deferred tax asset (see note 21)	2,136,504	4,151,336
Prepayments and accrued income	457,498	247,432
Other debtors	1,411,919	1,524,153
	32,778,100	90,633,068

An impairment loss of £19,418 (2018: £18,748) was recognised against trade debtors.

Debtors falling due after more than one year		
Amounts owed by fellow subsidiary	167,157,850	167,157,850
Deferred tax asset (see note 21)	5,966,000	7,633,000
	173,123,850	174,790,850

The amounts owed by fellow subsidiary due after more than one year consist of an unsecured promissory note with a maturity date of 1 December 2027. The promissory note bears interest at a rate of 7.24% per annum.

18. Creditors – Amounts falling due within one year	**2019**	**2018**
	£	**£**
Trade creditors	11,967,077	13,628,903
Amounts owed to fellow subsidiaries	13,886,169	13,463,928
Payroll and other taxes, including social security	492,991	496,188
Accruals, deferred income and other creditors	6,141,235	4,696,292
	32,487,472	32,285,311

19. Called up share capital

Ordinary shares of 40p each	Authorised No. of shares	Authorised £	Issued and fully paid No. of shares	Issued and fully paid £
At 1 January 2019	725,000,000	290,000,000	678,732,377	271,492,951
At 31 December 2019	725,000,000	290,000,000	678,732,377	271,492,951

There is a single class of ordinary shares. There are no restrictions on dividends nor on the repayment of capital.

20. Reserves

Called up share capital

This represents the nominal value of shares that have been issued.

Share premium account

This includes any premiums received on issue of share capital. Any transaction costs associated with the issuing of shares are deducted from the share premium.

Profit and loss account

This includes all current and prior period retained profits and losses.

21. Deferred Taxation

Deferred tax asset	2019 £	2018 £
Tax losses	904,000	3,286,000
ACT	7,169,000	8,459,000
Other timing differences	29,504	39,336
Deferred tax asset	8,102,504	11,784,336

In applying the Company's accounting policy for deferred tax, management has considered projections for the next three years to determine likely future taxable profits and judged that it is appropriate to recognise a deferred tax asset in respect of both ACT and trading losses.

Unprovided assets	2019 £	2018 £
Decelerated capital allowances	5,065,077	4,438,966
Capital losses	16,458,951	16,177,496
Surplus ACT	18,187,464	19,703,433
Losses	16,505,575	15,116,294
	56,217,067	55,436,189

22. Commitments and contingent liabilities	**2019 £**	**2018 £**
Future capital expenditure – contracts placed	-	-
The Company's future minimum operating lease payments are as follows:		
- within one year	461,586	382,179
- between one and five years	1,023,829	975,255
- later than five years	527	64,795
	1,485,942	1,422,229

Contingent liabilities also exist in respect of cross-guarantees given by the Company and its UK subsidiaries to support some of the Group's UK banking facilities amounting to £nil (2018: £nil).

23. Related Party Transactions

The Company has taken advantage of the exemption in FRS102, para 33.1A, not to disclose transactions with other group companies which meet the criteria that all subsidiary undertakings which are party to the transactions are wholly-owned.

Other operating income includes:	**2019 £**	**2018 £**
Royalties from associates	859,348	1,092,668

There are no other material related party transactions.

24. Post Balance Sheet Events

During 2020 there has been a worldwide pandemic caused by a novel coronavirus (SARS-CoV-2). As the virus was not identified at 31 December 2019, the date at which these accounts are prepared, it is a non-adjusting subsequent event.

On 30 November 2020 the Company sold certain assets of its piston pins business. This is considered to be a non-adjusting subsequent event.

In April 2020 the Company made an investment of £15,000,000 in one of its subsidiary undertakings, Federal-Mogul Controlled Power Limited.

In October 2020 the Company made an investment of £5,000,000 in one of its subsidiary undertakings, Federal-Mogul Controlled Power Limited.

In October 2020 the Company received a dividend of £16,449,353 from one of its subsidiary undertakings, FDML Holdings Limited.

In October 2020 the Company paid a dividend to its parent undertaking of £11,574,114.

25. Parent and ultimate parent company

The Company's immediate parent company is Federal-Mogul Global Growth Limited, a company registered in England and Wales. The ultimate parent company and controlling party is Tenneco Inc registered in the USA. The group accounts of Tenneco Inc are the smallest and largest group accounts in which the Company is included. Accounts of this company may be obtained from www.tenneco.com .

TENNECO

16 December 2020

Grant Thornton UK LLP
4 Hardman Square
Spinningfields
MANCHESTER
M3 3EB

Dear Sirs

Federal- Mogul Limited
Financial statements for the year ended 31st December 2019

This representation letter is provided in connection with the audit of the financial statements of Federal-Mogul Limited for the year ended 31st December 2019 for the purpose of expressing an opinion as to whether the financial statements give a true and fair view in accordance with applicable law and United Kingdom Accounting Standards, including FRS 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' ('United Kingdom Generally Accepted Accounting Practice').

We confirm that to the best of our knowledge and belief having made such inquiries as we considered necessary for the purpose of appropriately informing ourselves:

Financial statements

i We have fulfilled our responsibilities, as set out in the terms of the audit engagement letter dated 20 December 2019, for the preparation of the financial statements in accordance with United Kingdom Generally Accepted Accounting Practice; in particular the financial statements give a true and fair view in accordance therewith.

ii We acknowledge our responsibility for the design, implementation and maintenance of internal control to prevent and detect fraud.

iii Significant assumptions used by us in making accounting estimates, including those measured at fair value, are reasonable.

iv Related party relationships and transactions have been appropriately accounted for and disclosed in accordance with the requirements of United Kingdom Generally Accepted Accounting Practice.

v All events subsequent to the date of the financial statements and for which United Kingdom Generally Accepted Accounting Practice requires adjustment or disclosure have been adjusted or disclosed.

vi We have not adjusted the misstatements brought to our attention on the audit differences and adjustments summary, attached to this letter at Appendix I, as they are immaterial to the results of the company and the financial position of the company at the year-end. The financial statements are free of material misstatements, including omissions.

vii Actual or possible litigation and claims have been accounted for and disclosed in accordance with the requirements of United Kingdom Generally Accepted Accounting Practice.

viii We confirm that the carrying value of Fixed Assets of circa £477.2m is not impaired.

Information provided

ix We have provided you with:

a. Access to all information of which we are aware that is relevant to the preparation of the financial statements such as records, documentation and other matters;
b. Additional information that you have requested from us for the purpose of your audit; and
c. Unrestricted access to persons within the entity from whom you determined it necessary to obtain audit evidence.

x All transactions have been recorded in the accounting records and are reflected in the financial statements.

xi We have disclosed to you the results of our assessment of the risk that the financial statements may be materially misstated as a result of fraud.

xii We have disclosed to you all information in relation to fraud or suspected fraud that we are aware of and that affects the entity and involves:

a. Management;
b. Employees who have significant roles in internal control; or
c. Others where the fraud could have a material effect on the financial statements.

xiii We have disclosed to you all information in relation to allegations of fraud, or suspected fraud, affecting the entity's financial statements communicated by employees, former employees, analysts, regulators or others.

xiv We have disclosed to you all known instances of non-compliance or suspected non-compliance with laws and regulations whose effects should be considered when preparing financial statements.

xv We have disclosed to you the identity of the entity's related parties and all the related party relationships and transactions of which we are aware.

xvi We have disclosed to you all known actual or possible litigation and claims whose effects should be considered when preparing the financial statements.

xvii We confirm that financial support will continue to be provided from Federal-Mogul Limited to at least cover the below company's net current liabilities:

Federal-Mogul Controlled Power Limited - £10.1m

xviii We confirm that investments of £453.3m are recognised at an appropriate carrying value following your annual impairment assessment.

Yours faithfully

E. J. Milner
Director

Appendix I – Unadjusted Misstatements

Journal reference	Detail	Profit and loss account Debit (£)	Profit and loss account Credit (£)	Balance sheet Debit (£)	Balance sheet Credit (£)	Reason for not adjusting
1) Federal-Mogul Limited (Coventry)	Trade Debtors			78,776		Reclassification
	Trade Creditors				78,776	
	Being the reclassification of Credit Balances on the Trade Debtors ledger.					
2) Federal-Mogul Limited (Coventry)	Other Debtors			378,354		Reclassification
	Provision - Retro Price Adjustments				378,354	
	Relates to the proposed reclass of the Ford Material Recovery from Other Creditors to Other Debtors.					
3) Federal-Mogul Limited (Coventry)	Trade Creditors			7,030		Reclassification
	Amounts Owed to Group Undertakings				7,030	
	Being the reclassification of amounts owed to group on the creditors ledger.					

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

☑ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2019

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Commission file number 1-12387

TENNECO INC.

(Exact name of registrant as specified in its charter)

Delaware (State or other jurisdiction of incorporation or organization)	**76-0515284** (I.R.S. Employer Identification No.)
500 North Field Drive **Lake Forest, IL** (Address of principal executive offices)	**60045** (Zip Code)

Registrant's telephone number, including area code: (847) 482-5000

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol	Name of each Exchange on which registered
Class A Voting Common Stock, par value $.01 per share	TEN	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Note — Checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Exchange Act from their obligations under those Sections.

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or emerging growth company. See the definitions of "large accelerated filer," "accelerated filer", "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☑	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☑

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant as of June 28, 2019, computed by reference to the price at which the registrant's common stock was last sold on the New York Stock Exchange on June 28, 2019, was approximately $0.9 billion.

The number of shares of Class A Voting Common Stock, par value $0.01 per share: 57,412,301 shares outstanding as of February 27, 2020. The number of shares of Class B Non-Voting Common Stock, par value $0.01 per share: 23,793,669 shares outstanding as of February 27, 2020.

Documents Incorporated by Reference:

Document	Part of the Form 10-K into which incorporated
Portions of Tenneco Inc.'s Definitive Proxy Statement for the Annual Meeting of Stockholders	Part III

CAUTIONARY STATEMENT FOR PURPOSES OF THE "SAFE HARBOR" PROVISIONS OF THE PRIVATE SECURITIES LITIGATION REFORM ACT OF 1995

This report contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 concerning, among other things, our prospects and business strategies. These forward-looking statements are included in various sections of this report. The words "may," "will," "believe," "should," "could," "plan," "expect," "anticipate," "estimate," and similar expressions (and variations thereof), identify these forward-looking statements. Although we believe the expectations reflected in these forward-looking statements are based on reasonable assumptions, these expectations may not prove to be correct. Because these forward-looking statements are also subject to risks and uncertainties, actual results may differ materially from the expectations expressed in the forward-looking statements. Important factors that could cause actual results to differ materially from the expectations reflected in the forward-looking statements include:

- general economic, business and market conditions;
- our ability to successfully execute cost reduction and other performance improvement plans, including our accelerated performance improvement plan ("Accelerate"), and to realize the anticipated benefits from these plans;
- our ability to source and procure needed materials, components and other products, and services in accordance with customer demand and at competitive prices;
- the cost and outcome of existing and any future claims, legal proceedings or investigations, including, but not limited to, any of the foregoing arising in connection with the ongoing global antitrust investigation, product performance, product safety or intellectual property rights;
- changes in consumer demand for our original equipment ("OE") products or aftermarket products, prices and our ability to have our products included on top selling vehicles, including any shifts in consumer preferences away from historically higher margin products for our customers and us, to other lower margin vehicles, for which we may or may not have supply arrangements;
- the cyclical nature of the global vehicle industry, including the performance of the global aftermarket sector and the impact of vehicle parts' longer product lives;
- changes in automotive and commercial vehicle manufacturers' production rates and their actual and forecasted requirements for our products, due to difficult economic conditions and/or regulatory or legal changes affecting internal combustion engines and/or aftermarket products;
- our dependence on certain large customers, including the loss of any of our large OE manufacturer customers (on whom we depend for a significant portion of our revenues), or the loss of market shares by these customers if we are unable to achieve increased sales to other OE-customers or any change in customer demand due to delays in the adoption or enforcement of worldwide emissions regulations;
- new technologies that reduce the demand for certain of our products or otherwise render them obsolete;
- our ability to introduce new products and technologies that satisfy customers' needs in a timely fashion;
- the overall highly competitive nature of the automotive and commercial vehicle parts industries, and any resultant inability to realize the sales represented by our awarded book of business (which is based on anticipated pricing and volumes over the life of the applicable program);
- changes in capital availability or costs, including increases in our cost of borrowing (i.e., interest rate increases), the amount of our debt, our ability to access capital markets at favorable rates, and the credit ratings of our debt;
- our ability to comply with the covenants contained in our debt instruments;
- our working capital requirements;
- risks inherent in operating a multi-national company, including economic conditions, such as currency exchange and inflation rates, political conditions in the countries where we operate or sell our products, adverse changes in trade agreements, tariffs, immigration policies, political instability, tax and other laws, and potential disruptions of production and supply;
- increasing competition from lower cost, private-label products;
- damage to the reputation of one or more of our leading brands;
- the impact of improvements in automotive parts on aftermarket demand for some of our products;
- industry-wide strikes, labor disruptions at our facilities or any labor or other economic disruptions at any of our significant customers or suppliers or any of our customers' other suppliers;
- developments relating to our intellectual property, including our ability to changes in technology;
- costs related to product warranties and other customer satisfaction actions;

- the failure or breach of our information technology systems, including the consequences of any misappropriation, exposure or corruption of sensitive information stored on such systems and the interruption to our business that such failure or breach may cause;
- the impact of consolidation among vehicle parts suppliers and customers on our ability to compete in the highly competitive automotive and commercial vehicle supplier industry;
- changes in distribution channels or competitive conditions in the markets and countries where we operate;
- the evolution towards autonomous vehicles, and car and ride sharing;
- customer acceptance of new products;
- our ability to successfully integrate, and benefit from, any acquisitions we complete;
- our ability to effectively manage our joint ventures and other third-party relationships;
- the potential impairment in the carrying value of our long-lived assets, goodwill, and other intangible assets or the inability to fully realize our deferred tax assets;
- the negative impact of fuel price volatility on transportation and logistics costs, raw material costs, discretionary purchases of vehicles or aftermarket products and demand for off-highway equipment;
- increases in the costs of raw materials or components, including our ability to successfully reduce the impact of any such cost increases through materials substitutions, cost reduction initiatives, customer recovery, and other methods;
- changes by the Financial Accounting Standards Board ("FASB") or the Securities and Exchange Commission ("SEC") of generally accepted accounting principles or other authoritative guidance;
- changes in accounting estimates and assumptions, including changes based on additional information;
- any changes by the International Organization for Standardization ("ISO") or other such committees in their certification protocols for processes and products, which may have the effect of delaying or hindering our ability to bring new products to market;
- the impact of the extensive, increasing, and changing laws and regulations to which we are subject, including environmental laws and regulations, which may result in our incurrence of environmental liabilities in excess of the amount reserved or increased costs or loss of revenues relating to products subject to changing regulation;
- potential volatility in our effective tax rate;
- disasters, local and global public health emergencies or other catastrophic events, such as fires, earthquakes and flooding, pandemics or epidemics, where we or other customers do business and any resultant disruptions in the supply or production of goods or services to us or by us in demand by our customers or in the operation of our system, disaster recovery capabilities or business continuity capabilities;
- acts of war and/or terrorism, as well as actions taken or to be taken by the United States and other governments as a result of further acts or threats of terrorism, and the impact of these acts on economic, financial and social conditions in the countries where we operate;
- pension obligations and other postretirement benefits;
- our hedging activities to address commodity price fluctuations; and
- the timing and occurrence (or non-occurrence) of other transactions, events and circumstances which may be beyond our control.

In addition, this report includes forward-looking statements regarding the Company's ongoing review of strategic alternatives and the planned separation of the Company into a powertrain technology company and an aftermarket and ride performance company. Important factors that could cause actual results to differ materially from the expectations reflected in the forward-looking statements include:

- the ability to identify and consummate strategic alternatives that yield additional value for shareholders;
- the timing, benefits and outcome of the Company's strategic review process;
- the structure, terms and specific risk and uncertainties associated with any potential strategic alternative;
- potential disruptions in our business and stock price as a result of our exploration, review and pursuit of any strategic alternatives;
- the risk the Company may not complete a separation of its powertrain technology business and its aftermarket and ride performance business (or achieve some or all of the anticipated benefits of the separation);
- the risk the combined company and each separate company following the separation will underperform relative to our expectations;
- the ongoing transaction costs and risk we may incur greater costs following separation of the business;

- the risk the spin-off is determined to be a taxable transaction;
- the risk the benefits of the separation may not be fully realized or may take longer to realize than expected;
- the risk the separation may not advance our business strategy; and
- the risk the transaction may have an adverse effect on existing arrangements with us, including those related to transition, manufacturing and supply services and tax matters; our ability to retain and hire key personnel; or our ability to maintain relationships with customers, suppliers or other business partners.

The risks included here are not exhaustive. Refer to "Part I, Item 1A — Risk Factors" of this report for further discussion regarding our exposure to risks. Additionally, new risk factors emerge from time to time and it is not possible for us to predict all such risk factors, nor to assess the impact such risk factors might have on our business or the extent to which any factor or combination of factors may cause actual results to differ materially from those contained in any forward-looking statements. Given these risks and uncertainties, investors should not place undue reliance on forward-looking statements as a prediction of actual results. Unless otherwise indicated in this report, the forward-looking statements in this report are made as of the date of this report, and, except as required by law, the Company does not undertake any obligation, and disclaims any obligation, to publicly disclose revisions or updates to any forward-looking statements.

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PART I

ITEM 1. BUSINESS.

TENNECO INC.

General

Our company, Tenneco Inc., designs, manufactures, markets, and sells products and services for light vehicle, commercial truck, off-highway, industrial, and aftermarket customers. We are one of the world's leading manufacturers of innovative clean air, powertrain and ride performance products and systems, and serve both original equipment manufacturers ("OEM") and replacement markets worldwide. As used herein, the term "Tenneco," "we," "us," "our," or the "Company" refers to Tenneco Inc. and its consolidated subsidiaries.

We were incorporated in Delaware in 1996. In 2005, we changed our name from Tenneco Automotive Inc. to Tenneco Inc. The name Tenneco better represents the expanding number of markets we serve. Our Class A Voting Common Stock is traded on the New York Stock Exchange ("NYSE") under the symbol "TEN."

On October 1, 2018, we completed the acquisition of Federal-Mogul LLC ("Federal-Mogul", the "Federal-Mogul Acquisition"), a global supplier of technology and innovation in vehicle and industrial products for fuel economy, emissions reductions, and safety systems. Federal-Mogul serves the world's foremost OEM and servicers ("OES", and together with OEM, "OE") of automotive, light, medium and heavy-duty commercial vehicles, off road, agricultural, marine, rail, aerospace, and power generation and industrial equipment, as well as the worldwide aftermarket. The purchase price was $3.7 billion.

Following the closing of the Federal-Mogul Acquisition, we agreed to use our reasonable best efforts to pursue the separation of the combined company. As such, we previously announced our intention to separate our businesses through a spin-off transaction to form two new, independent, publicly traded companies, a new Powertrain Technology company ("New Tenneco") and an Aftermarket and Ride Performance company ("DRiV"). Current end-market conditions are affecting our ability to complete a separation within our previously announced timeline and we expect these trends will continue throughout this year. During 2020, we will be focused on the execution of our accelerated performance improvement plan ("Accelerate") to facilitate the expected separation of New Tenneco and DRiV. The Accelerate program is focused on achieving additional cost savings, improving capital efficiency, and reducing leverage. We have made significant progress to facilitate the planned separation of the DRiV business and have completed all necessary system and process components required for New Tenneco and DRiV to operate independently. In this respect, we are ready to separate the businesses as soon as favorable conditions are present. In order to facilitate the separation, we continue to evaluate multiple strategic alternatives, as well as options to deleverage and mitigate the ongoing effect of challenging market conditions.

The New Tenneco business consists of two existing operating segments, Clean Air and Powertrain:

- The Clean Air segment designs, manufactures and distributes a variety of products and systems designed to reduce pollution and optimize engine performance, acoustic tuning and weight on a vehicle for OEMs; and
- The Powertrain segment focuses on original equipment powertrain products for automotive, heavy duty, and industrial applications.

In preparation for the separation, in the first quarter of 2019, we began to manage and report our DRiV business through two new operating segments as compared to the three operating segments we had previously reported. The DRiV operating segments are Motorparts and Ride Performance. The new Motorparts operating segment consists of the previously reported Aftermarket operating segment as well as the aftermarket portion of the previously reported Motorparts operating segment. The Ride Performance operating segment consists of the previously reported Ride Performance operating segment as well as the OE Braking business that was included in the previously reported Motorparts operating segment:

- The Motorparts segment designs, manufactures, markets and distributes a broad portfolio of brand-name products in the global vehicle aftermarket within seven product categories including shocks and struts, steering and suspension, braking, sealing, engine, emissions, and maintenance; and
- The Ride Performance segment designs, manufactures, markets, and distributes a variety of ride performance solutions and systems to a global OE customer base, including noise, vibration, and harshness performance materials, advanced suspension technologies, ride control, and braking.

On January 10, 2019, we completed the acquisition of a 90.5% ownership interest in Öhlins Intressenter AB (the "Öhlins Acquisition"), a Swedish technology company that develops premium suspension systems and components for the automotive and motorsport industries, which is part of our Ride Performance operating segment. The purchase price was $162 million.

Our Internet address is *www.tenneco.com*. We make our proxy statements, annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports, as filed with or furnished to the Securities and

Exchange Commission ("SEC"), available free of charge on our Internet website as soon as reasonably practicable after submission to the SEC. Securities ownership reports on Forms 3, 4 and 5 are also available free of charge on our website as soon as reasonably practicable after submission to the SEC. The contents of our website are not, however, a part of this report.

Available Information

Our Audit Committee, Compensation Committee, and Nominating and Governance Committee Charters, Corporate Governance Principles, Stock Ownership Guidelines, Audit Committee policy regarding accounting complaints, Code of Ethical Conduct for Financial Managers, Code of Conduct, Policy and Procedures for Transactions with Related Persons, Equity Award Policy, Clawback Policy, Insider Trading Policy, policy for communicating with the Board of Directors, and Audit Committee policy regarding the pre-approval of audit, non-audit, tax and other services are available free of charge on our website at *www.tenneco.com.* In addition, we will make a copy of any of these documents available to any person, without charge, upon written request to Tenneco Inc., 500 North Field Drive, Lake Forest, Illinois 60045, Attn: General Counsel. We intend to satisfy the disclosure requirements under Item 5.05 of Form 8-K and applicable NYSE rules regarding amendments to, or waivers of, our Code of Ethical Conduct for Financial Managers and Code of Conduct by posting this information on our website at *www.tenneco.com.*

DESCRIPTION OF OUR BUSINESS

We design, manufacture, market, and sell innovative products and services for light vehicle, commercial truck, off-highway, industrial and aftermarket customers. We serve both original equipment (OE) manufacturers and replacement markets worldwide. Our portfolio of the industry's most well-respected, enduring brands includes Monroe®, Champion®, Öhlins®, MOOG®, Walker®, Fel-Pro®, Wagner®, Ferodo®, Rancho®, Thrush®, National®, and Sealed Power®, among others. We seek to leverage our OE product engineering and development capability, manufacturing know-how, and expertise in managing a broad and deep range of replacement parts to service the aftermarket. We effectively manage the life cycle of a broad range of products to a diverse customer base.

As a parts supplier, we produce individual component parts for vehicles as well as groups of components that are combined as modules or systems within vehicles. These parts, modules, and systems are sold globally to the world's leading light vehicle and commercial truck manufacturers as well as aftermarket customers, including independent warehouse distributors, distributors, engine rebuilders, retail parts stores, mass merchants, and service chains.

Our Industry

The parts industry for vehicles and engines is generally separated into two categories, both of which we operate within: (1) OE parts that are sold in large quantities directly for use by manufacturers of light vehicles, commercial vehicles, and other mobility markets, and (2) "aftermarket" or replacement parts that are sold in varying quantities to wholesalers, retailers, and installers. Light vehicles are comprised of passenger cars and light trucks, which include sport-utility vehicles ("SUVs"), crossover vehicles ("CUVs"), pick-up trucks, vans, and multi-purpose passenger vehicles. Commercial vehicles include commercial trucks, off-highway and industrial equipment, and two-wheel and motorsports.

Global OE Industry

Products for the global OE industry are sold directly to OE manufacturers that use these parts, which include components, systems, subsystems, and modules, in the manufacture of new light vehicles, commercial vehicles, rail, two-wheeler, and motorsports. Demand for component parts in the OE market is generally a function of the number of new vehicles/engines produced, which is driven by macroeconomic conditions and other factors such as fuel prices, consumer confidence, employment trends, regulatory requirements, and trade agreements. Although OE demand is tied to planned vehicle production, parts suppliers also have the opportunity to grow revenues by increasing their product content per vehicle. Companies, like us, with a global presence, leading technology and innovation, and advanced product, engineering, manufacturing, and customer support capabilities are best positioned to take advantage of these opportunities.

Key Industry Trends Affecting the Global OE Industry

Global Vehicle Sales and Production

Our business is directly affected by automotive sales and automotive vehicle production levels. Both of these depend on a number of factors, including global and regional economic conditions and policies. There have been periods of increased market volatility and uncertainty in the level of economic growth in China, which has resulted in periods of lower automotive production growth rates than previously experienced. Despite these declines, and the recent moderations in the level of economic growth in China, rising income levels in China are expected to result in stronger growth rates over the long-term.

We have a strong local presence in China, including a manufacturing base and well-established customer relationships. Each of our business segments have operations and sales in China. Our business in China remains sensitive to economic and market conditions, and may be affected if the pace of growth slows in China or if there are reductions in vehicle demand in China. However, we continue to believe there is long-term growth potential in this market based on increasing long-term automotive and vehicle content demand.

Advanced Suspension, Autonomous Driving, and Shared Mobility

There is a growing demand for autonomy and new mobility services. A number of trends are driving "Auto 2.0," defined as the transformation of cars into hybrid systems, fully-electric and autonomous vehicles, the consumer shift from individual car ownership to ride-sharing, and multi-modal forms of mobility.

We expect higher levels of autonomy will drive increased passenger expectations for a comfortable ride, which, in turn, will create additional content opportunities per vehicle and heighten demand for advanced suspension technology products, including full-corner/around-the-wheel intelligent suspension systems and broader motion management solutions. Advanced suspension technology is expected to grow with adoption led by existing and emerging global OE manufacturers. Increased connectivity also presents additional prospects for active suspension systems, predictive vehicle diagnostics, and system-based integration within the vehicle as well as broader vehicle to everything ("V2X") communications. The addition of Öhlins to the portfolio is expected to accelerate the development of advanced suspension technology solutions, while also fast-tracking time to market. It will also enhance our portfolio in broader mobility markets through the addition of Öhlins' range of premium OE and aftermarket automotive and motorsports performance products.

Shared mobility describes a range of transportation options that involve the shared use of a vehicle, motorcycle, scooter, bicycle or other means of travel; it provides users with short-term access to transportation on an as-needed basis. Shared mobility may reduce vehicle volumes in established markets, but it also provides an opportunity for us to develop higher-mileage, durable solutions to meet the needs of new mobility fleets, as well as aftermarket replacement solutions and services. Additionally, ride comfort and durability will become important differentiators as consumers increasingly take advantage of the sharing economy.

Increasing Technologically Sophisticated Content and Vehicle Complexity

As end users and consumers continue to demand vehicles with improved performance, safety and functionality at competitive prices, the components and systems in these vehicles are becoming technologically more advanced and sophisticated. Mechanical functions are being replaced with electronics and mechanical and electronic devices are being integrated into single systems.

Focus on Fuel Efficiency Improvements and Powertrain Evolution

Continued focus on environmental sustainability by consumers and governments worldwide is increasing the expectations for the auto industry to develop more fuel-efficient solutions. Evolution of alternative powertrain technology, including the increased adoption of hybrid and fully electric powertrains, will also create further opportunities for increased ride performance and noise, vibration, and harshness ("NVH") capabilities, as consumers look for smoother, quieter, and more efficient rides. Engine downsizing and hybridization will lead to a proliferation of NVH requirements per platform as road noise and other NVH properties that were once masked by engine noise become more apparent to consumers. Furthermore, fully electric vehicles ("EVs") will likely have a suite of fundamentally different NVH, braking, and ride performance requirements. Our capabilities in the suspension, braking, and NVH performance materials categories provide the opportunity to develop solutions that maximize driving comfort, ride performance, and motion management for consumers worldwide in the increasing hybridization and electrification of the global vehicle fleet.

The products our clean air segment provides reduce the tailpipe emissions of criteria pollutants. In addition, regulations have been adopted to regulate greenhouse gas emissions of carbon dioxide. Reducing carbon-dioxide ("CO_2") emissions requires improving fuel economy; as a result, improved combustion efficiency and reduction of vehicle mass have become priorities. As a leading supplier of clean air systems with strong technical capabilities, we believe we are well positioned to benefit from the more rigorous environmental standards being adopted around the world.

The demand for smaller but more powerful engines requires more technology per engine to withstand the higher output requirements and reduce friction, which we estimate will result in an increase in content per engine for our powertrain business. With a global manufacturing presence, we believe we are well-positioned to meet expectations of our global customers. For the foreseeable future, it is expected that gasoline and diesel engines will remain the dominant powertrain for cars (including hybrids), heavy-duty, and industrial applications. We are equally capable of providing components for both gasoline and diesel engines.

Enhanced Vehicle Safety and Handling

To serve the needs of their customers and meet government mandates, OE manufacturers are seeking parts suppliers that invest in new technologies, capabilities and products that advance vehicle safety and handling, such as roll-over protection systems, advanced suspension technologies, and safer, more durable materials. Suppliers, like us, that are able to offer such innovative products and technologies have a distinct competitive advantage. We offer adjustable and adaptive damping as well as semi-active suspension systems designed to improve vehicle stability, handling, and control.

We also are a global leader in the development of leading friction formulas that improve vehicle stopping distances and performance. As the commercial truck customers migrate to air disc brake systems, we remain at the forefront of providing the brake friction necessary for these new systems.

Many of our aftermarket products directly affect vehicle performance. Product quality, reliability, and consistency are paramount to our end-customers, the majority of whom are professional service technicians. Our engineering expertise and product capabilities from chassis to braking allow us to provide around-the-wheel offering. Additionally, we have a number of braking products including disc pads for passenger cars, motorcycles and commercial vehicles; drum brake shoes and linings for commercial vehicles; and brake accessories including rotors, drums, hydraulics, hardware, and brake fluid.

Sourcing by OE Manufacturers and Component Part Number Proliferation

As OE manufacturers expand their reach, many are looking for suppliers with a global footprint and the capability to supply them with full system integration and solutions, rather than individual standalone products.

Because of these trends, OE manufacturers are increasingly seeking suppliers capable of supporting vehicle platforms on a global basis. They want suppliers like us with design, production, engineering and logistics capabilities that can be accessed not just in North America and Europe but also in emerging markets such as India and China. OE manufacturers have standardized on global platforms, designing basic mechanical structures suitable for a number of similar vehicle models and are able to accommodate different features across regions. This standardization will drive growth in production of light vehicles designed on global platforms. Accordingly, global platforms, identified as platforms produced in more than one region, are expected to grow. While the overall number of vehicle platforms will consolidate and decrease, the component level complexity to meet the diversified consumer and regulatory requirements around the world is expected to cause component part number proliferation.

As new and existing OE manufacturers look to simplify and streamline design, they are also increasingly selecting suppliers like us that provide fully-engineered, integrated systems, and solutions. OE manufacturers have steadily outsourced more of the design and manufacturing of vehicle parts and systems to simplify the assembly process, lower costs, and reduce development times. Furthermore, they have demanded from their parts suppliers fully integrated, functional modules, and systems made possible with the development of advanced electronics in addition to innovative, individual vehicle components, and parts that may not readily interface together.

Global Aftermarket Industry
Products for the global aftermarket are sold directly to a wide range of distributors, retail parts stores, and mass merchants that distribute these products to professional service providers, "do-it-yourself" consumers, and, in some cases, directly to service chains. Demand for aftermarket products historically has been driven by four primary factors:

i. the number of vehicles in operation ("VIO");
ii. the average age of VIO;
iii. vehicle usage trends; and
iv. component failure and wear rates.

These factors, while applicable in all regions, vary depending on the composition of VIO and other factors.

Key trends affecting the Global Aftermarket Industry

Growth in the Number of VIO in both Mature and Emerging Markets
The global number of VIO is expected to grow, with the number of VIO in emerging markets such as China expected to increase significantly. The number of VIO in mature markets, such as North America and Europe, is also expected to grow, though at a lesser pace than the emerging markets. We have strong aftermarket positions in North America, Europe, and South America and a growing aftermarket position in Asia. We expect there to be aftermarket growth opportunities in emerging markets such as China and India where the VIO are expected to increase and are investing to position ourselves as a leading aftermarket supplier in these regions. We are leveraging our market-leading capabilities from mature markets and investing to develop the right distributor base, drive brand recognition, increase product coverage, build the supply chain, and promote our experience as an OE-quality supplier.

Increase in the Average Age of Vehicles in Operation
The average age of VIO in North America and Europe has increased significantly this century and is expected to increase further. Increases in the average age of VIO will drive the need for maintenance and repair work, thereby increasing the overall demand for aftermarket replacement parts in North America and Europe. The average age of VIO in China is expected to increase, which we believe will lead to continuing significant growth in the China aftermarket.

Managing Product-line Complexity and Private Labels
We operate in a highly fragmented and dynamic industry and are among the few large, aftermarket-focused suppliers globally. The increasing global vehicle population, brand and vehicle complexity, and need for rapid new part introduction, as well as new distribution channels (including online) continue to drive significant stock keeping unit ("SKU") proliferation and business complexity. Our recent investments in our supply chain and information technology capabilities are designed to manage this complexity, which we believe will be an important competitive differentiator.

In many of our markets, there has been an increase in private label or store brands sold by retailers and distributors at a lower price point than premium brands of the same products. However, in many cases, retailers or wholesale distributors creating private label brands still rely on established suppliers to design and manufacture their private label products and, in some cases, utilize co-branding to support their private label offerings. We intend to selectively continue to co-brand with private label manufacturers where it can help to strategically grow our branded products portfolio.

We have some of the strongest and most recognized brands in the automotive aftermarket. We will continue to invest in product innovation, marketing, and brand support that differentiates our premium branded products for their quality while also supporting lower priced, mid-grade offerings. Additionally, we will continue to drive productivity and cost reduction efforts and enhance our already strong global sourcing capabilities to remain competitive in each product tier.

Channel Consolidation
In the more mature markets of North America and Europe, there has been increasing consolidation in the aftermarket distribution channel with larger aftermarket distributors and retailers gaining market share. These distributors generally require larger, more capable suppliers that have the ability to provide world-class product expertise, category management capabilities, brand management, and supply chain support, as well as a competitive manufacturing and sourcing network. We have undertaken many initiatives to support the value of our branded products to end-market consumers and diversify our revenue base.

Growth of Online Capabilities and Changing Consumer Decision Making
Reaching end-customers, which include distributors and retailers, technicians, and consumers, directly through online capabilities, including e-commerce, is expected to have an increasing effect on the global aftermarket industry and how aftermarket products are marketed and sold. The establishment of a robust online presence will be critical for suppliers regardless of whether they intend to participate directly in e-commerce. We invested heavily in online initiatives to improve our capabilities and connectivity to our end-customers, including a new online order management system, customer relationship management tools, global brand websites, and data analytics capabilities. We will continue to invest in these competencies.

Additionally, consumers increasingly are utilizing online research prior to making buying or repair decisions. We will continue to expand our online presence in order to connect with our customers and more effectively communicate the value of our premium aftermarket brands.

Importance of Distribution, Speed and Parts Availability
Efficient distribution capabilities are essential as the aftermarket industry works to balance product availability with overall inventory in the ecosystem. Installers expect the right product to be available at the right time and the need for fast, predictable local parts delivery is growing as consumers' expectations for quick, high quality service increase. In addition, we are seeing the developing aftermarket augment traditional distribution and service models with real-time scheduling through personalized internet applications. We are adjusting our fulfillment models to optimize this complexity and better align and synchronize with our customers and supply base to reduce non-value add steps, time, and distance in our value chain. We are also engaging with key customers to jointly optimize product availability and delivery.

Resilience during Economic Downturn
Aftermarket products are largely stable, non-discretionary, and less susceptible to cyclicality as customers often have no choice but to replace automotive parts that are worn. During the 2008 economic downturn, the number of consumers with the ability to purchase new vehicles declined and led to increased demand for aftermarket parts in order to keep older vehicles road-worthy.

Customers
We strive to develop long-standing business relationships with our customers around the world. We work collaboratively with our OE customers in all stages of production, including design, development, component sourcing, quality assurance, manufacturing, and delivery. For both OE and aftermarket customers, we provide timely delivery of quality products at competitive prices and deliver customer service. With our diverse product mix and numerous facilities in major markets worldwide, we believe we are well positioned to meet customer needs.

Our OE customers consist of automotive and commercial manufacturers as well as agricultural, off-highway, marine, railroad, aerospace, high performance, and power generation and industrial application manufacturers. We have well-established relationships with substantially all major American, European, and Asian automotive OE manufacturers.

The following customers accounted for 10% or more of our net sales in any of the last three years.

Customer	2019	2018	2017
General Motors Company	11%	12%	14%
Ford Motor Company	10%	12%	13%

Our aftermarket customers include independent warehouse distributors that redistribute products to local parts suppliers, distributors, engine rebuilders, retail parts stores, mass merchants, and service chains. The breadth of our product lines, the strength of our leading marketing expertise, a sizable sales force, and supply chain and logistics capabilities are central to our success in the aftermarket. We have a large and diverse aftermarket customer base.

Competition
We operate in highly competitive markets. Customer loyalty is a key element of competition in these markets and is developed through long-standing relationships, customer service, high quality value-added products, and timely delivery. Product pricing and services provided are other important competitive factors.

As a supplier of OE and aftermarket parts, we compete with the vehicle manufacturers, some of which are also customers of ours, and numerous independent suppliers. We believe we are meeting these competitive challenges by developing leading technologies, efficiently integrating and expanding our manufacturing and distribution operations, widening our product coverage within our core businesses, restructuring our operations and transferring production to best cost countries, and utilizing our worldwide technical centers to develop and provide value-added solutions to our customers.

Seasonality
Our businesses are somewhat seasonal. OE production is historically higher in the first half of the year compared to the second half. It typically decreases in the third quarter due to OE plant shutdowns for model changeovers and European holidays, and softens further in the fourth quarter due to reduced production during the end-of-year holiday season in North America and Europe. Shut-down periods in the rest of the world generally vary by country. Our aftermarket operations experience relatively higher demand during the spring as vehicle owners prepare for the summer driving season. While seasonality does affect our business, actual results may vary from the above trends due to global and local economic dynamics, as well as industry-specific platform launches and other production-related events. Aftermarket sales tend not to be as adversely affected during periods of economic downturn, as consumers forgo new vehicle purchases and keep their vehicles longer, thereby increasing demand for repair and maintenance services.

The aftermarket is affected by changes in economic conditions, volatility in fuel prices, and expanding focus on environmental and energy conservation.

Order Fulfillment
For OE customers, we generally receive long-term production contracts for specific products supplied for particular vehicles with target volumes. These supply relationships typically extend over the life of the related vehicle, subject to interim design and technical specification revisions. In addition to customary commercial terms and conditions, long-term production contracts generally provide for annual price adjustments based upon expected productivity improvements, material price variation, and other factors. OE customers typically retain the right to terminate agreements due to changing business conditions, but we generally cannot terminate agreements given development cycles and change costs. OE order fulfillment is typically manufactured in response to customer purchase order releases, as we ship directly from a manufacturing location to a customer for use in vehicle production and assembly. Accordingly, our manufacturing locations turn finished goods inventory relatively quickly, producing from on-hand raw materials and work-in-process inventory within relatively short manufacturing cycles. Risks to us include a change in vehicle production, lower than expected vehicle or engine production by one or more of our OE customers, or termination of the business based upon perceived or actual shortfalls in delivery, quality or value.

For our global aftermarket customers, we generally establish arrangements that encompass substantially all parts offered within a particular product line. In some cases, we will enter into agreements with terms ranging from one to three years that cover one or more product lines. Pricing is market responsive and subject to adjustment based upon competitive pressures, material costs, and other commercial factors. Typical price adjustments occur on an annual basis as part of the product line reviews. Global aftermarket order fulfillment is largely performed from finished goods inventory stocked in our regional distribution centers. Inventory stocking levels in our distribution centers are established based upon historical and anticipated future customer demand, adjusted for lead times, demand variability and target service levels.

Although customer programs typically extend to future periods, and although there is an expectation we will supply certain levels of OE production over such periods, we believe outstanding purchase orders and product line arrangements do not constitute firm orders. Firm orders are limited to specific and authorized customer purchase order releases placed with our manufacturing and distribution centers for actual production and order fulfillment. Firm orders are typically fulfilled as promptly as possible after receipt from the conversion of available raw materials and work-in-process inventory for OE orders and from current on-hand finished goods inventory for aftermarket orders.

Clean Air Segment
Our Clean Air Segment operates 59 clean air manufacturing facilities worldwide, of which 15 facilities are located in North America, 19 in Europe, 2 in South America, and 23 in Asia Pacific. Within these manufacturing facilities in Asia Pacific, we operate 10 joint ventures in which we hold a controlling interest. Clean Air operates 7 engineering and technical facilities.

Clean Air designs, manufactures, markets, and distributes a variety of clean air products and systems. Vehicle emission control products and systems play a critical role in safely conveying noxious exhaust gases away from the passenger compartment and reducing the level of pollutants and engine exhaust noise emitted to acceptable levels. Precise engineering of the exhaust system - which extends from the manifold that connects an engine's exhaust ports to an exhaust pipe, to the catalytic converter that eliminates pollutants from the exhaust, and to the muffler that modulates noise emissions - leads to a pleasantly tuned engine sound, reduced pollutants, and optimized engine performance.

The following table sets forth a description of the product lines sold by our Clean Air segment:

Product	Description
Catalytic converters and diesel oxidation catalysts	Devices consisting of a substrate coated with precious metals enclosed in a steel casing used to reduce harmful gaseous emissions such as carbon monoxide.
Diesel particulate filters (DPFs)	Devices to capture and regenerate particulate matter emitted from diesel engines.
Burner systems	Devices which actively combust fuel and air inside the exhaust system to create extra heat for DPF regeneration, or to improve the efficiency of SCR systems.
Lean NOx traps	Devices which reduce nitrogen oxide (NOx) emissions from diesel powertrains using capture and store technology.
Hydrocarbon vaporizers and injectors	Devices to add fuel to a diesel exhaust system in order to regenerate particulate filters or Lean NOx traps.
SCR systems	Devices which reduce NOx emissions from diesel powertrains using urea mixers and injected reductants such as Verband der Automobil industrie e.V.'s AdBlue® or Diesel Exhaust Fluid (DEF).
SCR-coated diesel particulate filters (SDPF) systems	Lightweight and compact devices combining the SCR catalyst and the particulate filter onto the same substrate for reducing NOx and particulate matter emissions.
Urea dosing systems	Systems comprised of a urea injector, pump, and control unit, among other parts, that dose liquid urea onto SCR catalysts.
Four-way catalysts	Devices that combine a three-way catalyst and a particulate filter onto a single device by having the catalyst coating of a converter directly applied onto a particulate filter.
Alternative NOx reduction technologies	Devices which reduce NOx emissions from diesel powertrains, by using, for example, alternative reductants such as diesel fuel, E85 (85% ethanol, 15% gasoline), or solid forms of ammonia.
Mufflers and resonators	Devices to provide noise elimination and acoustic tuning.
Fabricated exhaust manifolds	Components that collect gases from individual cylinders of a vehicle's engine and direct them into a single exhaust pipe. Fabricated manifolds can form the core of an emissions module that includes an integrated catalytic converter (maniverter) and/or turbocharger.
Pipes	Utilized to connect various parts of both the hot and cold ends of an exhaust system.
Hydroformed assemblies	Forms in various geometric shapes, such as Y-pipes or T-pipes, which provide optimization in both design and installation as compared to conventional pipes.
Elastomeric hangers and isolators	Used for system installation and elimination of noise and vibration, and for the improvement of useful life.
Aftertreatment control units	Computerized electronic devices that utilize embedded software to regulate the performance of active aftertreatment systems, including the control of sensors, injectors, vaporizers, pumps, heaters, valves, actuators, wiring harnesses, relays and other mechatronic components.

For the catalytic converters, SCR systems, and other substrate-based devices we sell, we need to procure substrates coated with precious metals or purchase the complete systems in the case of catalytic converter systems. We obtain these components and systems from third parties, often at the OE manufacturer's direction, or directly from OE vehicle and engine manufacturers. See Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations" for more information on our sales of these products.

Powertrain Segment
Our Powertrain Segment operates 85 manufacturing sites worldwide, of which 23 facilities are located in North America, 34 are located in Europe, 5 are located in South America, and 23 in Asia Pacific, serving a large number of major automotive, heavy-duty, marine, and industrial customers worldwide. Within these manufacturing facilities, we operate 18 joint ventures in which we hold a controlling interest. Powertrain has also invested globally in nonconsolidated affiliates that have multiple manufacturing sites, primarily in China, Turkey, and the United States. Powertrain operates 14 engineering and technical facilities.

Powertrain designs, manufactures, markets, and distributes a variety of powertrain products and systems. Powertrain offers its customers a diverse array of market-leading products for OE applications, including pistons, piston rings, piston pins, cylinder liners, valvetrain products, valve seats and guides, ignition products, dynamic seals, bonded piston seals, combustion and exhaust gaskets, static gaskets and seals, rigid heat shields, engine bearings, industrial bearings, bushings and washers, systems protection sleeves, acoustic shielding, and flexible heat shields.

The following table sets forth a description of the product lines sold by our Powertrain segment:

Product	**Description**
Pistons	Pistons convert the energy created by the combustion event into mechanical energy to drive a car; Pistons can be made from aluminum or steel, both casted and forged; Highly efficient engines impose high demands on pistons in terms of rigidity and temperature resistance.
Piston rings	Piston rings are mounted on the piston to seal the combustion chamber while the piston is moving up and down; Modern rings need to resist high temperature and very abrasive environments without significant wear; Rings are critical for low oil consumptions.
Cylinder liners	Cylinder liners, or sleeves, are specially engineered where surfaces formed within the engine block, working in tandem with the piston and ring, as the chamber in which the thermal energy of the combustion process is converted into mechanical energy.
Valve seats and guides	Valve seats and guides are produced from powdered metal based on sophisticated metal-ceramic structures to meet extreme requirements for hardness.
Bearings	Bearings provide the low-friction environment for rotating components like crankshafts and camshafts; Modern bearings are able to deal with very low viscosity oil even in highly repetitive motions like in stop/start-conditions.
Spark plugs	Modern spark plugs for engines fueled by gasoline or natural gas have to ignite fuel even at very high combustion pressure and with very clean fuel-air mixture - combined with extended life expectation well over 100,000 miles for turbo-charged engines.
Valvetrain products	Valvetrain products include mainly engine valves but also retainers, rotators, cotters, and tappets for use in both diesel and gas engines; the most demanding applications require sodium-filled hollow valves for fast heat dissipation.
System protection	System protection products include protection sleeves for wire harness and for oil and water tubes as well as acoustic and EMI/RFI shielding, heat and abrasion protection, and safety/ crash protection for cables and tubes for engines and cars.
Seals and gaskets	Cylinder-head gaskets and other hot and cold gaskets are sealing engines and engine components; dynamic and static seals protecting rotating engine and transmission components against oil and gas leakages. Such seals and gaskets are made from high-alloyed steel as well as from sophisticated rubber and polymers.

Motorparts Segment
Our Motorparts segment operates 17 manufacturing sites, of which 8 facilities are located in North America, 3 in Europe, 2 in South America, and 4 in Asia Pacific. It also operates 56 distribution centers and warehouses; 5 engineering and technical centers; and 10 technical service centers worldwide. Motorparts shares engineering testing facilities with our Ride Performance segment.

Motorparts designs, manufactures, markets, and distributes leading, brand-name products to a diversified and global aftermarket customer base. Within the business, Motorparts has many of the most recognized brand-name products in the automotive industry, including Monroe®, Champion®, Öhlins®, MOOG®, Walker®, Fel-Pro®, Wagner®, Ferodo®, Rancho®, Thrush®, National®, Sealed Power® and others. We believe our brand equity in the aftermarket is a key asset especially as customers consolidate and distribution channels converge with many of our brands leading their product categories. Our Motorparts products can be classified into two general product groups: chassis solutions products and power tech solutions products.

The following table sets forth a description of the chassis solutions product lines sold by our Motorparts segment:

Product	Description
Shocks and Struts	Shock absorbers, strut assemblies, bare strut, coil springs, top mounts, and ride control accessories.
Steering and Suspension	Control arms, ball joints, tie rod ends, wheel bearings, sway bar links, hub assembly, and universal joints.
Braking	Shoes, pads, rotors, drums, and master cylinders.

The following table sets forth a description of the power tech solutions product lines sold by our Motorparts segment:

Product	Description
Sealing	Head gaskets, valve cover gaskets, oil seals, and other gaskets.
Engine	Pistons, piston ring set, engine bearings, valves, valve-train, camshafts, valve lifters, and oil pumps.
Emissions	Catalytic converters, exhaust manifolds, exhaust pipes, and mufflers.
Maintenance	Spark plugs, air filters, oil filters, cabin air filter, batteries, headlamps, glow plugs, and chemicals.

Ride Performance Segment
Our Ride Performance segment operates 40 ride performance manufacturing facilities worldwide, of which 11 facilities are located in North, 14 in Europe, 3 in South America, and 12 in Asia Pacific. Within these manufacturing facilities, we operate 3 joint ventures in which we hold a controlling interest. We operate 19 engineering and technical facilities worldwide.

Ride Performance designs, manufactures, markets, and distributes a variety of ride performance solutions and systems to a global OE customer base, including NVH performance materials, advanced suspension technologies, ride control, and braking. In addition to automotive light vehicles and commercial vehicles, Ride Performance also services a wide range of other mobility markets such as rail, two-wheelers, such as motorcycles and mountain bikes, and motorsports.

The following table sets forth a description of the product lines sold by our Ride Performance segment:

Product	Description
NVH Performance Materials	Highly engineered NVH isolation technology and value-added products for light vehicle and commercial vehicle markets.
Advanced Suspension Technologies	Advanced passive and semi-active suspension with tuning support and controls capability for the light vehicle, two-wheel and motorsports markets.
Ride Control	Providing conventional shocks, struts, and dampers with value-added tuning solutions for the light vehicle and commercial vehicle markets.
Braking	Friction materials, including cutting edge formulations for the light vehicle, commercial vehicle, and rail markets.

On January 10, 2019, we closed on our acquisition of Öhlins, a Sweden-based company. Öhlins offers suspension systems and components to automotive and motorsport industries.

Sales, Marketing and Distribution
We have separate and distinct sales and marketing efforts for our OE and aftermarket customers.

For OE sales, our sales and marketing team is an integrated group of sales professionals, including skilled engineers and program managers, who are organized globally by customer business unit and product type (e.g., Ride Performance, Clean Air, and Powertrain). Our sales and marketing teams are focused on meeting and exceeding our customer's needs by delivering engineered products and services on time; maximizing profit for our investors while financing continued growth and product development; and developing a common system approach to create a superior customer experience. Our teams provide the appropriate mix of operational and technical expertise needed to interface successfully with OE manufacturers. Our business capture process involves targeting select programs and working closely with the OE manufacturer platform engineering and purchasing teams. Bidding on OE automotive platforms typically encompasses many months of engineering and business development activity. Throughout the process, our sales team, program managers, and product engineers assist the OE customer in defining the project's technical and business requirements. A normal part of the process includes our engineering and sales personnel working on customers' integrated product teams, creating a statement of requirements, and assisting our customers with full system or component design and development concepts that deliver expectations and create value for OE manufacturer customers. Given the Clean Air, Ride Performance, and Powertrain operations typically involve long-term production contracts awarded on a platform-by-platform basis, our strategy is to leverage our engineering expertise and strong customer relationships to target and win new business and increase operating margins.

For aftermarket sales and marketing, our sales force is generally organized by region and customer and covers multiple product lines. We sell aftermarket products through five primary channels of distribution: (1) traditional three-step distribution system of full-line warehouse distributors, jobbers, and service providers; (2) two-step distribution system of warehouse distributors that distribute directly to the service providers; (3) direct sales to retailers; (4) direct sales to service provider chains; and (5) direct sales through online channels. Our aftermarket sales and marketing representatives cover all levels of the distribution channel, stimulating interest in our products and helping our products move through the distribution system. Also, to generate demand for our products, we run print, online, and outdoor advertisements as well as training conducted by our field sales force and e-training courses. In addition, we maintain detailed web sites for certain of our brands.

Business Strategy
We are a leading diversified, global supplier of innovative products and services to light vehicle, commercial truck, off-highway, industrial, and aftermarket customers. Our strategy focuses on addressing the evolving needs of our OE and aftermarket customers around the world to drive growth. The key components of our business strategy are described below:

Continue to optimize operational performance by aggressively pursuing cost competitiveness in all business segments and continuing to drive cash flow generation and meet capital allocation objectives
As we continue to expand our distribution and service capabilities globally, we seek to continue optimizing our performance through enhanced efficiencies in order to meet the world-class delivery performance our customers increasingly require. We have made and will continue to make investments in our global distribution network to maximize our manufacturing footprint and manage complexities of our supply chain. By achieving efficiency gains and cost competitiveness, we strive to generate strong cash flow and meet our capital allocation objectives, including deleveraging our balance sheet.

From a design perspective, we will bring a lean mindset to our portfolio to ensure standardization, remove redundancies, reduce transit costs, leverage economies of scale, and optimize manufacturing productivity. We will also continually look for ways to innovate and leverage cross- and up-sell opportunities to the market through a customer-centric product development process. From a manufacturing perspective, we will maintain a continuous improvement philosophy by streamlining plant operations and our network, and executing projects to improve efficiency.

Serving our customers also requires that we compete effectively at the unit cost level, in particular with OE customers. We are making concerted and systematic efforts to continuously improve our position on the cost curve for each of our component part categories. In doing so, we will continue to be a preferred supplier to our customers.

We will be mindful of the changing market conditions that might necessitate adjustments to our resources and manufacturing capacity around the world. We will also remain committed to protecting the environment as well as the health and safety of our employees.

Pursue focused transactional opportunities, consistent with our capital allocation priorities, product line enhancements, technological advancements, geographic positioning, penetration of emerging markets and market share growth
Throughout our history, we have successfully identified and capitalized on acquisitions, alliances, and divestitures to achieve strategic growth and alignment. Through these transactions, we have (1) expanded our product portfolio with complementary technologies; (2) realized incremental business from existing customers; (3) gained access to new customers; (4) achieved leadership positions in geographic regions outside North America; and (5) re-focused on areas that will contribute to our profitable growth.

We intend to continue to explore strategic alliances, joint ventures, acquisitions, divestitures, and other transactions that complement, expand, enhance or realign our existing products, technology, systems development efforts, customer base and/or global presence. We are committed to developing a broader ecosystem-based approach that allows us to work with new and existing customers, suppliers, and entrants to provide timely and leading-edge solutions across the mobility market. We will align with companies that have proven products, proprietary technology, advanced research capabilities, broad geographic reach, and/or strong market positions to further strengthen our product leadership, technology position, global reach, and customer relationships.

Adapt cost structure to economic realities
We aggressively respond to difficult economic environments, aligning our operations to any resulting reductions in production levels and replacement demand and executing comprehensive restructuring and cost-reduction initiatives. Suppliers must continually identify and implement product innovation and cost reduction activities to fund customer annual price concession expectations in order to retain current business as well as to be competitively positioned for future new business opportunities.

Original Equipment Specific Strategies
The converging forces of connectivity, autonomy, electrification, and shared mobility are spawning a new age of automotive autonomy and a unique opportunity to position our business for significant growth and profitability. We strive to strengthen our global position by designing, manufacturing, delivering, and marketing technologically innovative products and solutions for OE manufacturers. The key components of our OE strategy are described below:

Capitalize on our breadth of technology, differentiated products, and global reach to support and strengthen relationships with existing and emerging OE customers across the world
We conduct business with nearly all of the major automotive OE customers around the world. Within the highly competitive automotive parts industry, we seek to extend the significant advantages that come from our world-class global manufacturing, engineering and distribution footprint and global sourcing capabilities. This footprint enables the design, production and delivery of premium parts emphasizing quality, safety and reliability virtually anywhere in the world and also supports the continual innovation of new products, technologies, and solutions for new and existing OE customers.

Maintain technological leadership to drive further growth from secular market trends
In order to maintain our strong market positions, we are focused on meeting changing performance requirements and keeping up with emerging OE trends such as connectivity, autonomy, shared mobility, and electrification. In pursuit of delivering the ideal ride characteristics for any application, our ride performance division will leverage its innovative technology, NVH performance materials, differentiated products, and advanced system capabilities to provide innovative solutions. Aligning product lines and technical capabilities creates an ideal foundation to meet changing performance requirements for comfort and safety and again ultimately reinventing the ride of the future. The addition of Öhlins to the portfolio will accelerate the development of advanced technology suspension solutions, while also fast-tracking time to market. That acquisition is yet another example of our strategy to leverage key technologies that will better position us to take advantage of secular trends. It also enhances our portfolio in broader mobility markets through the addition of Öhlins' range of premium OE and aftermarket automotive and motorsports performance products. In addition, our suite of mobility solutions under development represents an opportunity to drive greater partnership with OE manufacturers and broader mobility ecosystem players, creating and capturing value, and growth with higher value content per vehicle.

OE manufacturers are responding to changing end customer trends and preferences alongside their own challenging cost structures by reducing design and production complexities and investing in advanced technologies that enable vehicle electrification and autonomy. We anticipate that OE suppliers with high technology capabilities in vehicle system integration will be able to enable a more seamless transition to next-generation electric vehicles and become preferred suppliers to OE manufacturers. Though many vehicle and customer requirements will evolve, we believe one of the remaining characteristics that will continue to provide differentiated experience and value in the future of mobility is the ride experience. By leveraging our deep component level expertise as well as working with partners across the broader mobility ecosystem, our intent is to lead in the next generation development of motion management products, systems and solutions to engineer the ideal ride for any customer.

Penetrate adjacent market segments
We seek to penetrate a variety of adjacent sales opportunities and achieve growth in higher-margin businesses by applying our design, engineering and manufacturing capabilities. For example, we aggressively leverage our technology and engineering leadership in powertrain, clean air, ride performance and aftermarket into adjacent sales opportunities for heavy-duty trucks, buses, agricultural equipment, construction machinery, and other vehicles in other regions around the world.

We design and launch clean air products for commercial vehicle customers such as Caterpillar, for whom we are their global diesel clean air system integrator, John Deere, Navistar, Deutz, Daimler Trucks, Scania, Weichai Power, FAW Group, and Kubota. We also engineer and build modular NOx-reduction systems for large engines that meet standards of the International Maritime Organization, among others.

Aftermarket Specific Strategies
Our aftermarket business strategy incorporates a go-to-market model that we believe differentiates us from our competitors and creates structural support for sustained revenue growth. The model is designed to drive revenue growth by capitalizing on three of the company's key competitive strengths: a leading portfolio of products and brands; extensive global manufacturing, distribution and service capabilities; and market intelligence gathered from the company's distributors, installers and consumers.

We expect this distinctive go-to-market model will result in a sustainable competitive advantage, particularly as the industry trends previously mentioned disrupt the traditional aftermarket landscape and business practices. We expect the demand for replacement parts to increase as a result of the increase in the average age of VIO and the increase in the average miles driven per year. The characteristics of aftermarket sales and distribution are defined regionally, which require regionally focused strategies to address the key success factors of our customers. The key components of our aftermarket strategy are described below:

Leverage the strength of our global aftermarket leading brands positions, product portfolio and range, marketing and selling expertise, and distribution and logistics capabilities
Our aftermarket business includes multiple leading brands with strong product offerings. Our portfolio includes the industry's most well-respected and enduring brands. We will leverage our go-to-market model to build upon our brand strengths and grow our global aftermarket business by consistently delivering differentiated benefits, by growing our brand equity among our target end-customers, and by leveraging our broad product coverage and extensive distribution network. We are in an outstanding position to capitalize on aftermarket trends and expand in mature markets (e.g., North America, Europe, and Australia) as well as high-growth regions (i.e. China, South America, India, and Southeast and Northeast Asia). Important focus areas are enhancing our presence in high-growth markets; leveraging our portfolio and strong presence in suspension to expand our business globally; and diversifying outside of chassis with our sealing, engine and underhood products, as well as other components.

Continue to strengthen our aftermarket capabilities and product offerings in mature markets, including North America and Europe
The scale of our aftermarket business allows for strong distribution channels that significantly enhance our go-to-market capabilities across mature markets in North America and Europe. We continually rationalize our already strong distribution networks with the goal of improved customer service at a lower cost. This is achieved by continually harnessing and leveraging market intelligence, and sharing information with our channel partners to drive best practices in go-to-market, manufacturing and distribution processes.

The North America and Europe go-to-market capabilities will be defined by positioning our distribution and installer partners for success. We believe this will require maintaining an extensive catalog of products to provide the ability to address customer requirements quickly and easily. Managing a large and complex catalog of products requires an understanding of the composition of the car parc within the regions including wear patterns, typical replacement rates based on weather, road quality, and average miles driven annually. These compositions differ significantly by region, which will affect the range and frequency of replacement part requirements. The understanding of these regional dynamics will help us provide the right parts when they are needed and achieve the industry's best "Order to Delivery" times. We will continue to innovate product solutions that will be cost competitive and reliable, reduce install time, reduce the number of unique parts that installers need to inventory on-site, reduce the number of unique installer tools and equipment required, and improve installer safety.

In addition to having a comprehensive product offering, we also strive to maintain very close relationships with our customers and help position them for success. We have launched a series of "Tech First" initiatives to provide online, on demand, and onsite technical training and support to vehicle repair technicians who use and install our products in North America, Europe, and China and plan to expand into South America. This initiative included Garage Gurus™, a network of technical support centers that provide some of the most comprehensive training programs in the industry to educate our partners and customers with emerging vehicle technologies and vehicle repair operational skills. We believe it is key to our strategy to provide aftermarket parts that are simple to install and to make sure our customers have the resources to know how to install these parts properly. In having the right products and resources for our customers, we believe we will continue to be a preferred aftermarket supplier and continue to drive growth in the Americas and emerging economic areas.

Increase aftermarket position in high-growth regions, notably in Asia Pacific
The Asia Pacific region, particularly the high-growth markets of China and India, presents a significant opportunity for us to expand our business. We have made investments in distribution and in our sales force in both China and the rest of Asia to help drive growth in this increasingly important region. We must take into account the different operational requirements in Asia Pacific in order to drive aftermarket growth in this region.

The Asia Pacific light vehicle and commercial vehicle aftermarket industry is fragmented with a large number of small distributors and installers that require different strategies and solutions than more mature consolidated markets. Distribution in smaller volumes will require us to have a hub and spoke warehousing approach to compete on the basis of optimal "Order to Delivery" timeliness while maintaining a broad range of products.

Additionally, buying online is the preferred purchase method for many smaller distribution and installer partners. The sophistication of the existing online marketplaces in Asia Pacific will require us to develop adaptive and flexible omnichannel tools in order to compete effectively. We believe that developing a competitive online platform for our Asia Pacific customers will be the foundation for us to build a digital platform that will improve our competitiveness globally.

Environmental Matters

For additional information regarding environmental matters, see Item 3, "Legal Proceedings," Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations — Environmental Matters" and Note 15—Commitments and Contingencies of the consolidated financial statements included in Item 8, "Financial Statements and Supplementary Data."

Employees

As of December 31, 2019, we had approximately 78,000 employees of whom approximately 50% were covered by collective bargaining agreements. With the exception of two facilities in the U.S., most of our unionized manufacturing facilities have their own contracts with their own expiration dates and, as a result, no contract expiration date affects more than one facility.

Raw Materials

We purchase various raw materials and component parts for use in our manufacturing processes, including ferrous and non-ferrous metals, non-metallic raw materials, stampings, castings, and forgings. We also purchase parts manufactured by other manufacturers for sale in the aftermarket. The principal raw material that we use is steel. We obtain steel from a number of sources pursuant to various contractual and other arrangements. We believe that an adequate supply of steel can presently be obtained from a number of different domestic and foreign suppliers. We address price increases by evaluating alternative materials and processes, reviewing material substitution opportunities, increasing component sourcing and parts assembly in best cost countries, strategically pursuing regional and global purchasing strategies for specific commodities, and aggressively negotiating with our customers to allow us to recover these higher costs from them.

Intellectual Property

We are the owner of a large number of United States and foreign country patents and trademarks relating to our products and businesses. We manufacture and distribute our aftermarket products and products sold directly to OE manufacturers under a number of trademarks that are well-recognized in the marketplace. The patents, trademarks and other intellectual property owned by or licensed to us are important in the manufacturing, marketing, and distribution of our products. The primary purpose in obtaining patents is to protect our designs, technologies, and products. However, we do not materially rely on any single patent, nor will the expiration of any single patent materially affect our business. While our current patents will expire in the normal course at various times between now and 2040, we continually develop new technologies and products and apply for and obtain new United States and foreign patents.

ITEM 1A. RISK FACTORS.

Future deterioration or prolonged difficulty in economic conditions could have a material adverse impact on our business, financial position, and liquidity.
We are a global company and, as such, our businesses are affected by economic conditions in the various geographic regions in which we do business. Economic difficulties generally lead to tightening of credit and liquidity. These conditions often lead to low consumer confidence or changes in consumer spending, which in turn may result in delayed and reduced purchases of durable goods such as automobiles and other vehicles. As a result, during difficult economic times our OE customers can significantly reduce their production schedules. For example, light vehicle production declined significantly during the economic crisis in 2008 and 2009 in North America and Europe. More recently, light vehicle and commercial vehicle production has declined significantly in South America in 2015 and 2016 and persistent challenges in the Chinese economy beginning in 2018 and continuing into 2020 may result in declining light vehicle and commercial vehicle production. Additionally, production of off-highway equipment with our content on them have been weak in certain product applications, such as agricultural and construction equipment in North America and Europe. Any deterioration or prolonged difficulty in economic conditions in any region in which we do business could have a material adverse effect on our business, financial position and liquidity.

In addition, economic difficulties often lead to disruptions in the financial markets, which may adversely impact the availability and cost of credit which could materially and negatively affect our company. Future disruptions in the capital and credit markets could adversely affect our customers' and our ability to access the liquidity that is necessary to fund operations on terms that are acceptable to us or at all.

In addition, financial or other difficulties at any of our major customers could have a material adverse impact on us, including as a result of lost revenues, significant write downs of accounts receivable, significant impairment charges or additional restructuring beyond our current global plans. Severe financial or other difficulties at any of our major suppliers could have a material adverse effect on us if we are unable to obtain on a timely basis on similar economic terms the quantity and quality of components we require to produce our products.

Moreover, severe financial or operating difficulties at any light vehicle or commercial vehicle manufacturer or other supplier could have a significant disruptive effect on the entire industry, leading to supply chain disruptions and labor unrest, among other things. These disruptions could force original equipment manufacturers and, in turn, other suppliers, including us, to shut down production at plants. While the issues that our customers and suppliers face during economic difficulties may be primarily financial in nature, other difficulties, such as an inability to meet increased demand as conditions recover, could also result in supply chain and other disruptions.

Factors that reduce demand for our products or reduce prices could materially and adversely impact our financial condition and results of operations.
Demand for and pricing of our products are subject to economic conditions and other factors present in the various domestic and international markets where our products are sold. Demand for our OE products is subject to the level of consumer demand for new vehicles that are equipped with our parts. The level of new light vehicle, commercial truck and off-highway vehicle purchases is cyclical, affected by such factors as general economic conditions, interest rates and availability of credit, consumer confidence, patterns of consumer spending, industrial construction levels, fuel costs, government incentives, and vehicle replacement cycles. Consumer preferences and government regulations also impact the demand for new light vehicle purchases equipped with our products. For example, if consumers increasingly prefer electric vehicles, demand for the vehicles equipped with our clean air products would decrease.

Demand for our aftermarket, or replacement, products varies based upon such factors as general economic conditions; the level of new vehicle purchases, which initially displaces demand for aftermarket products; the severity of winter weather, which increases the demand for certain aftermarket products; the number of vehicles in operation; and other factors, including the average useful life of parts and number of miles driven.

The highly cyclical nature of the automotive and commercial vehicle industry presents a risk that is outside our control and that cannot be accurately predicted. Decreases in demand for automobiles and commercial vehicles and vehicle parts generally, or in the demand for our products in particular, could materially and adversely impact our financial condition and results of operations.

In addition, we believe that increasingly stringent environmental standards for emissions have presented and will continue to present an important opportunity for us to grow our clean air product line. We cannot assure you, however, that environmental standards for emissions will continue to become more stringent or that the adoption of any new standards will not be delayed beyond our expectations.

We are dependent on certain large customers for future revenue. The loss of all or a substantial portion of our revenues from any of these customers or the loss of market share by these customers could have a material adverse impact on us.
We depend on major vehicle manufacturers for a substantial portion of our revenues. For example, during the fiscal year ended December 31, 2019, General Motors and Ford accounted for 11% and 10% of our net sales. Following the Federal-Mogul Acquisition, we are increasingly dependent on certain major aftermarket customers for our revenues. The loss of all or a substantial portion of our revenues from any of our large-volume customers could have a material adverse effect on our financial condition and results of operations by reducing cash flows and our ability to spread costs over a larger revenue base. We may experience decreased revenues from these customers for a variety of reasons, including but not limited to: (i) in the case of our OE customers, loss of awarded platforms, reduced demand for our customers' products, and work stoppages or other disruptions impacting OE production, and (ii) in the case of our aftermarket customers, reduced or delayed consumer requirements and competition from other brands or lower-cost alternatives. Further, our aftermarket customers are generally able to change suppliers more quickly than OE customers, which exacerbates these risks with respect to our aftermarket business. For all of our customers, we face the risk of their failure to pay us for a variety of reasons, including their respective financial conditions.

In addition, our customers compete intensively against each other. The loss of market share by any of our major customers could have a material adverse effect on our business unless we are able to achieve increased sales to other major customers.

We are subject to, and could be further subject to, government investigations or actions by other third parties.
We are subject to a variety of laws and regulations that govern our business both in the United States and internationally, including antitrust laws, violations of which can involve civil or criminal sanctions. Responding to governmental investigations or other actions may be both time-consuming and disruptive to our operations and could divert the attention of our management and key personnel from our business operations.

For example, antitrust authorities in various jurisdictions are investigating possible violations of antitrust laws by multiple automotive parts suppliers, including Tenneco. In addition, Tenneco and certain of its competitors are currently subject to civil putative class action lawsuits in the United States, which allege anti-competitive conduct related to the activities subject to these investigations. More related lawsuits may be filed, including in other jurisdictions.

While we have established a reserve that we believe is adequate to resolve Tenneco's antitrust matters globally, we cannot, however, assure you that the reserve will not change materially from time to time or that the costs, charges and liabilities associated with these matters will not exceed any amounts reserved for them in our consolidated financial statements.

We may be unable to realize sales represented by our awarded business, which could materially and adversely impact our financial condition and results of operations.
The realization of future sales from awarded business is inherently subject to a number of important risks and uncertainties, including the number of vehicles that our OE customers will actually produce, the timing of that production and the mix of options that our OE customers and consumers may choose. For example, light vehicle production declined significantly during the economic crisis in 2008 and 2009 in North America and Europe. More recently, light vehicle and commercial truck production declined significantly in South America in 2015 and 2016 and persistent challenges in the Chinese economy in 2018 and going into 2020 may result in declining light and commercial vehicle production in the region. In addition to the risks inherent in the cyclicality of vehicle production, our customers generally have the right to replace us with another supplier at any time for a variety of reasons and have demanded price decreases over the life of awarded business. Accordingly, we cannot assure you that we will in fact realize any or all of the future sales represented by our awarded business. Any failure to realize these sales could have a material adverse effect on our financial condition, results of operations, and liquidity.

In many cases, we must commit substantial resources in preparation for production under awarded OE business well in advance of the customer's production start date. In certain instances, the terms of our OE customer arrangements permit us to recover these pre-production costs if the customer cancels the business through no fault of our company. Although we have been successful in recovering these costs under appropriate circumstances in the past, we can give no assurance that our results of operations will not be materially impacted in the future if we are unable to recover these types of pre-production costs in the event of an OE customer's cancellation of awarded business.

Our level of debt, which increased in amount and percentage of floating rate debt as a result of the Federal-Mogul Acquisition, makes us more sensitive to the effects of economic downturns; and provisions in our debt agreements could constrain our ability to react to changes in the economy or our industry.

Our leverage increased as a result of the Federal-Mogul Acquisition. As of December 31, 2019, we had approximately $3.5 billion of indebtedness outstanding under our new senior credit facility, $1.9 billion of outstanding notes and approximately $0.2 billion of other debt. In addition, as a result of the acquisition we have increased exposure to interest rate fluctuations because our percentage of floating rate debt increased.

Our level of debt makes us more vulnerable to changes in our results of operations because a significant portion of our cash flow from operations is dedicated to servicing our debt and is not available for other purposes and our level of debt could impair our ability to raise additional capital if necessary. Further increases in interest rates will increase the amount of cash required for debt service. Under the terms of our senior secured credit facility, the indentures governing our notes and the agreements governing our other indebtedness, we are able to incur significant additional indebtedness in the future. The more we become leveraged, the more we, and in turn our security holders, become exposed to many of the risks described herein.

Our ability to make payments on our indebtedness depends on our ability to generate cash in the future. If we do not generate sufficient cash flow to meet our debt service, capital investment and working capital requirements, we may need to seek additional financing or sell assets. If we require such financing and are unable to obtain it, we could be forced to sell assets under unfavorable circumstances and we may not be able to sell assets quickly enough or for sufficient amounts to enable us to meet our obligations.

In addition, our senior credit facility and our other debt agreements contain covenants that limit our flexibility in planning for or reacting to changes in our business and our industry, including limitations on our ability to:

- declare dividends or redeem or repurchase capital stock;
- prepay, redeem or purchase other debt;
- incur liens;
- make loans, guarantees, acquisitions and investments;
- incur additional indebtedness;
- amend or otherwise alter debt and other material agreements;
- engage in mergers, acquisitions or asset sales; and
- engage in transactions with affiliates.

Our failure to comply with the covenants contained in our debt instruments, including as a result of events beyond our control, could result in an event of default, which could materially and adversely affect our operating results and our financial condition.

Our senior credit facility and other agreements governing financings we enter into from time to time require us to maintain certain financial ratios. Our senior credit facility and our other financing instruments require us to comply with various operational and other covenants. If there were an event of default under any of our financing instruments that was not cured or waived, the holders of the defaulted financing could cause all amounts outstanding with respect to that financing to be due and payable immediately (which, in turn, could also result in an event of default under one or more of our other financing arrangements). If such event occurs, the lenders under our senior credit facility could elect to terminate their commitments, cease making further loans and institute foreclosure proceedings against our assets and we could lose access to our factoring and supply chain financing programs. We cannot assure you that our assets or cash flow would be sufficient to fully repay borrowings under our outstanding financing instruments, either upon maturity or if accelerated, upon an event of default, or that we would be able to refinance or restructure the payments on those financing instruments. This would have a material adverse impact on our liquidity, financial position and results of operations, and on our ability to affect our share repurchase and dividend programs. For example, we recently amended our senior credit agreement to relax the financial ratios we are required to maintain to facilitate operational flexibility in light of our outlook for the second half of 2020. Even though we are able to obtain that amendment in February 2020, we cannot assure you that we would be able to obtain an amendment on commercially reasonable terms, or at all, if required in the future.

Our working capital requirements may negatively affect our liquidity and capital resources.

Our working capital requirements can vary significantly, depending in part on the level, variability and timing of our customers' worldwide vehicle production and the payment terms with our customers and suppliers. If our working capital needs exceed our cash flows from operations, we would look to our cash balances and availability for borrowings under our borrowing arrangements to satisfy those needs, as well as potential sources of additional capital, which may not be available on satisfactory terms and in adequate amounts, if at all.

We may be unable to realize the expected benefits of our initiatives to improve operating performance and generate cost savings and improvements.
We regularly implement strategic and other initiatives designed to improve our operating performance. Our inability to implement these initiatives in accordance with our plans or our failure to achieve the goals of these initiatives could have a material adverse effect on our business. We rely on these initiatives to offset pricing pressures from our suppliers and our customers, as described above, as well as to manage the impacts of production cuts. Our implementation of announced initiatives is from time to time subject to legal challenge in certain non-U.S. jurisdictions (where applicable employment laws differ from those in the United States). Furthermore, the terms of our senior credit facility and the indentures governing our notes may restrict the types of initiatives we undertake. In the past we have been successful in obtaining the consent of our senior lenders where appropriate in connection with our initiatives. We cannot assure you, however, that we will be able to pursue, successfully implement or realize the expected benefits of any initiative or that we will be able to sustain improvements made to date.

Exchange rate fluctuations could cause a decline in our financial condition and results of operations.
As a result of our international operations, we are subject to increased risk because we generate a significant portion of our net sales and incur a significant portion of our expenses in currencies other than the U.S. dollar. For example, where we have a greater portion of costs than revenues generated in a foreign currency, we are subject to risk if the foreign currency in which our costs are paid appreciates against the currency in which we generate revenue because the appreciation effectively increases our cost in that country.

The financial condition and results of operations of some of our operating entities are reported in foreign currencies and then translated into U.S. dollars at the applicable exchange rate for inclusion in our consolidated financial statements. As a result, appreciation of the U.S. dollar against these foreign currencies generally will have a negative impact on our reported revenues and operating profit while depreciation of the U.S. dollar against these foreign currencies will generally have a positive effect on reported revenues and operating profit.

We do not generally seek to mitigate the impacts of currency through the use of derivative financial instruments. To the extent we are unable to match revenues received in foreign currencies with costs paid in the same currency, exchange rate fluctuations in that currency could have a material adverse effect on our business.

The hourly workforce in the industry in which we participate is highly unionized and our business could be adversely affected by labor disruptions in the United States or internationally.
A portion of our hourly workforce in North America and the majority of our hourly workforce in other regions are unionized. Although we consider our current relations with our employees to be satisfactory, if major work disruptions were to occur, our business could be adversely affected by, for instance, a loss of revenues, increased costs or reduced profitability. We have not experienced a material labor disruption in our recent history, but there can be no assurance that we will not experience a material labor disruption at one of our facilities in the future in the course of renegotiation of our labor arrangements or otherwise.

In addition to the risk of a work stoppage at one of our facilities, labor disruptions at other domestic or international companies may have an adverse effect on us. In the United States, substantially all of the hourly employees of General Motors, Ford and Fiat Chrysler Automobiles in North America and many of their other suppliers are represented by The International Union, United Automobile, Aerospace and Agricultural Implement Workers of America ("UAW") under collective bargaining agreements. Internationally, certain vehicle manufacturers, their suppliers and their respective employees are also subject to labor agreements. In September 2019, General Motors hourly workers represented by the UAW went on strike, which affected the volumes at certain of our North American plants in the third quarter of 2019. Although the strike was resolved on October 25, 2019, the strike affected volumes in the fourth quarter of 2019 as well. A work stoppage or strike at one of our production facilities, at those of a customer, or impacting a supplier of ours or any of our customers, either domestically or internationally, could have an adverse impact on us by disrupting demand for our products or our ability to manufacture our products.

From time to time we experience significant increases and fluctuations in raw materials pricing and increases in certain lead times; and future changes in the prices of raw materials or utility services, or future increases in lead times, could have a material adverse impact on us.
Significant increases in the cost of certain raw materials used in our products, mainly steel, oil and rubber, or the cost of utility services required to produce our products, to the extent they are not timely reflected in the price we charge our customers or are otherwise mitigated, could materially and adversely impact our results. For example, in March 2018, the current U.S. administration imposed a 25% tariff on steel imports and a 10% tariff on aluminum imports and over the course of 2018 and

2019, the U.S. government imposed additional tariffs on products from China. In addition, during 2017, carbon steel prices as well as raw material prices (such as ferrochrome, iron ore, scrap and coking coal) to produce carbon steel remained at high levels after the sharp increases in 2016. In addition, both the European Union as well as the United States continue to impose a variety of anti-dumping duties on carbon steel as well as stainless steel. This not only results in higher domestic pricing but limits opportunities in terms of off shore buying. Carbon steel prices in North America increased further in the fourth quarter of 2017 in the run-up to the mandated "232 Section Investigations" against the import deadline of mid-January 2018.

We attempt to mitigate price increases by evaluating alternative materials and processes, reviewing material substitution opportunities, increasing component sourcing and parts assembly in best cost countries, and strategically pursuing regional and global purchasing strategies for specific commodities. We also aggressively negotiate to recover these higher costs from our customers, and in some cases, such as with respect to steel surcharges, we have the contractual right to recover some or all of these higher costs from certain of our customers. However, if we are successful in recovering these higher costs, we may not receive that recovery in the same period that the costs were incurred and the benefit of the recovery may not be evenly distributed throughout the year.

We also continue to pursue productivity initiatives and other opportunities to reduce costs through restructuring activities. During periods of economic recovery, the cost of raw materials and utility services generally rise. Accordingly, we cannot ensure that we will not face further increased prices in the future or, if we do, whether our actions will be effective in containing them.

By entering into new product lines and employing new technologies, our ability to produce certain of these products may be constrained due to longer lead times for our facilities, as well as those of our suppliers. We attempt to mitigate the negative effects of these longer lead times by improving the accuracy of our long-term planning; however, we cannot provide any certainty that we will always be successful in avoiding disruptions to our delivery schedules.

We may incur costs related to product warranties, environmental and regulatory matters, legal proceedings and other claims, which could have a material adverse impact on our financial condition and results of operations.

From time to time, we receive product warranty claims from our customers, pursuant to which we may be required to bear costs of repair or replacement of certain of our products. Vehicle manufacturers require their outside suppliers to guarantee or warrant their products and to be responsible for the operation of these component products in new vehicles sold to consumers. Warranty claims may range from individual customer claims to full recalls of all products in the field. We cannot assure you that costs associated with providing product warranties will not be material, or that those costs will not exceed any amounts reserved in our consolidated financial statements. For a description of our accounting policies regarding warranty reserves, see "Management's Discussion and Analysis of Financial Condition and Results of Operations — Critical Accounting Policies" included in Item 7.

Our global operations subject us to extensive governmental regulations worldwide. Foreign, federal, state and local laws and regulations may change from time to time and our compliance with new or amended laws and regulations in the future may materially increase our costs and could adversely affect our results of operations and competitive position. For example, we are subject to a variety of environmental and pollution control laws and regulations in all jurisdictions in which we operate. Soil and groundwater remediation activities are being conducted at certain of our current and former real properties. We record liabilities for these activities when environmental assessments indicate that the remedial efforts are probable and the costs can be reasonably estimated. On this basis, we have established reserves that we believe are adequate for the remediation activities at our current and former real properties for which we could be held responsible. Although we believe our estimates of remediation costs are reasonable and are based on the latest available information, the cleanup costs are estimates and are subject to change as more information becomes available about the extent of remediation required. In future periods, we could incur cash costs or charges to earnings if we are required to undertake remediation efforts as the result of ongoing analysis of the environmental status of our properties. In addition, violations of the laws and regulations we are subject to could result in civil and criminal fines, penalties and sanctions against us, our officers or our employees, as well as prohibitions on the conduct of our business, and could also materially affect our reputation, business and results of operations.

We also from time to time are involved in a variety of legal proceedings, claims or investigations. These matters typically are incidental to the conduct of our business. Some of these matters involve allegations of damages against us relating to environmental liabilities, intellectual property matters, personal injury claims, taxes, employment matters or commercial or contractual disputes or allegations relating to legal compliance by us or our employees. For example, we are subject to a number of lawsuits initiated by a significant number of claimants alleging health problems as a result of exposure to asbestos. Many of these cases involve significant numbers of individual claimants. Many of these cases also involve numerous defendants. As major asbestos manufacturers or other companies that used asbestos in their manufacturing processes continue to go out of business, we may experience an increased number of these claims.

We vigorously defend ourselves in connection with all of the matters described above. We cannot, however, assure you that the costs, charges and liabilities associated with these matters will not be material, or that those costs, charges and liabilities will not exceed any amounts reserved for them in our consolidated financial statements. In future periods, we could be subject to cash costs or charges to earnings if any of these matters are resolved unfavorably to us. See "Management's Discussion and Analysis of Financial Condition and Results of Operations — Environmental and Legal Contingencies" included in Item 7.

Developments relating to our intellectual property could materially impact our business.
We and others in our industry hold a number of patents and other intellectual property rights, including licenses, which are critical to our respective businesses and competitive positions. Notwithstanding our intellectual property portfolio, our competitors may develop similar or superior proprietary technologies. Further, as we expand into regions where the protection of intellectual property rights is less robust, the risk of others replicating our proprietary technologies increases, which could result in a deterioration of our competitive position. On occasion, we may assert claims against third parties who are taking actions that we believe are infringing on our intellectual property rights. Similarly, third parties may assert claims against us and our customers and distributors alleging our products infringe upon third party intellectual property rights. These claims, regardless of their merit or resolution, are frequently costly to prosecute, defend or settle and divert the efforts and attention of our management and employees. Claims of this sort also could harm our relationships with our customers and might deter future customers from doing business with us. If any such claim were to result in an adverse outcome, we could be required to take actions which may include: expending significant resources to develop or license non-infringing products; paying substantial damages to third parties, including to customers to compensate them for their discontinued use or replacing infringing technology with non-infringing technology; or cessation of the manufacture, use or sale of the infringing products. Any of the foregoing results could have a material adverse effect on our business, financial condition, results of operations or our competitive position.

We are increasingly dependent on information technology, and if we are unable to protect against service interruptions or security breaches, our business could be adversely affected.
Our operations rely on a number of information technologies to manage, store, and support business activities. Some of these technologies are managed by third-party service providers and are not under our direct control. We have put in place a number of systems, processes, and practices designed to protect against the failure of our systems, as well as the misappropriation, exposure or corruption of the information stored thereon. Unintentional service disruptions or intentional actions such as intellectual property theft, cyber-attacks, unauthorized access or malicious software, may lead to such misappropriation, exposure or corruption if our, or our service providers', protective measures prove to be inadequate. Further, these events may cause operational impediments or otherwise adversely affect our product sales, financial condition and/or results of operations. We could also encounter violations of applicable law, contracts or reputational damage from the disclosure of confidential information belonging to us or our employees, customers or suppliers. In addition, the disclosure of non-public information could lead to the loss of our intellectual property and/or diminished competitive advantages. Should any of the foregoing events occur, we may be required to incur significant costs to protect against damage caused by these disruptions or security breaches in the future. In addition, evolving and expanding compliance and operational requirements under the privacy laws of the jurisdictions in which we operate, such as the EU General Data Protection Regulation, or GDPR, which took effect in May 2018, impose significant costs that are likely to increase over time or potential fines for non-compliance.

We may have difficulty competing favorably in the highly competitive light vehicle and commercial vehicle supplier industry.
The light vehicle and commercial vehicle supplier automotive parts industry is highly competitive. Although the overall number of competitors has decreased due to ongoing industry consolidation, we face significant competition within each of our major product areas, including from new competitors entering the markets which we serve. The principal competitive factors include price, quality, service, product performance, design and engineering capabilities, new product innovation, global presence and timely delivery. As a result, many suppliers have established or are establishing themselves in emerging, low-cost markets to reduce their costs of production and be more conveniently located for customers. Although we are also pursuing a best-cost country production strategy and otherwise continue to seek process improvements to reduce costs, we cannot assure you that we will be able to continue to compete favorably in this competitive market or that increased competition will not have a material adverse impact on our business by reducing our ability to increase or maintain sales or profit margins.

In addition, our competitors may foresee the course of market development more accurately than we do, develop products that are superior to ours, adapt more quickly than we do to new technologies or evolving customer requirements or develop or introduce new products or solutions before we do, particularly in respect of potential transformative technologies such as autonomous driving solutions. As a result, our products may not be able to compete successfully with their products. These trends may adversely affect our sales as well as the profit margins on our products. Failure to innovate and to develop or acquire products that capitalize on new technologies could have a material adverse impact on our results of operations.

Furthermore, due to the cost focus of our major OE customers, we have been, and expect to continue to be, requested to reduce prices as part of our initial business quotations and over the life of OE vehicle platforms we have been awarded. We cannot be certain that we will be able to generate cost savings and operational improvements in the future that are sufficient to offset price reductions requested by existing OE customers and necessary to win additional business. OE customers also direct us to engage specific suppliers for component purchases not allowing us to leverage our own supply base and realize cost reductions on this directed spend.

The decreasing number of customers and suppliers in our industry could make it more difficult for us to compete favorably.
Our financial condition and results of operations could be adversely affected because the customer base for our parts and services is decreasing in both the OE market and aftermarket. As a result, we are competing for business from fewer customers. Furthermore, consolidation among suppliers have resulted in fewer, larger suppliers who benefit from purchasing and distribution economies of scale. If we cannot achieve cost savings and operational improvements sufficient to allow us to compete favorably in the future with these larger companies, our financial condition and results of operations could be adversely affected.

Our aftermarket sales may be negatively impacted by increasing competition from lower cost, private-label products.
Distribution channels in the aftermarket have continued to consolidate and, as a result, our sales to large retail customers represent a significant portion of our aftermarket business. Private-label aftermarket products, which are typically manufactured at a lower cost, often containing little or no premium technology, and are branded with a store or other private-label brand, are increasingly available to these large retail customers. Our aftermarket business is facing increasing competition from these lower cost, private-label products and there is growing pressure to expand our entry-level product lines so that retailers may offer a greater range of price points to their consumer customers. We cannot assure you that we will be able to maintain or increase our aftermarket sales to these large retail customers or that increased competition from these lower cost, private-label aftermarket products will not have an adverse impact on our aftermarket business.

If the reputation of one or more of our leading brands is harmed, aftermarket sales may be negatively impacted.
Our aftermarket sales are dependent on the reputation and success of our brands, including Monroe®, Champion®, Öhlins®, MOOG®, Walker®, Fel-Pro®, Wagner®, Ferodo®, Rancho®, Thrush®, National®, Sealed Power® and others. Product liability claims or recalls could result in negative publicity that could harm the reputation of our brands. If one or more of our leading brands suffers damage to its reputation due to real or perceived quality or safety issues, our financial results could be adversely affected.

Improvements in automotive parts are adversely affecting aftermarket demand for some of our products.
The average useful life of automotive parts has steadily increased in recent years due to innovations in products and technologies. The longer product lives allow vehicle owners to replace parts of their vehicles less often. As a result, a portion of sales in the aftermarket has been displaced. In addition, advancements in technology may lead to enhancements in aftermarket product performance that render our product obsolete. This has adversely impacted, and could continue to adversely impact, our aftermarket sales. Also, any additional increases in the average useful lives of automotive parts or other enhancements in aftermarket performance would further adversely affect the demand for our aftermarket products.

If we do not respond appropriately, the evolution towards connectivity, autonomy, shared mobility and electrification could adversely affect our business.
The light vehicle industry is increasingly focused on the development of advanced driver assistance technologies, with the goal of developing and introducing a commercially viable, fully autonomous vehicle. Continued focus on environmental sustainability is increasing the expectations for the auto industry to develop more fuel-efficient solutions from consumers and governments worldwide. There has also been an increase in consumer preferences for car and ride sharing, as opposed to automobile ownership, which may result in a long-term reduction in the number of vehicles per capita. These evolving areas have also attracted increased competition from entrants outside the traditional light vehicle industry. Failure to innovate and to develop or acquire new and compelling products that capitalize upon new technologies in response to OE and consumer preferences could have a material adverse impact on our results of operations.

We may not be able to respond quickly enough to changes in technology and to develop our intellectual property into commercially viable products.
Changes in competitive technologies may render certain of our products obsolete or less attractive. Our ability to anticipate changes in technology and to successfully develop and introduce new and enhanced products on a timely basis are significant factors in our ability to remain competitive and to maintain or increase our revenues.

We cannot provide assurance that certain of our products will not become obsolete or that we will be able to achieve the technological advances that may be necessary for us to remain competitive and maintain or increase our revenues in the future. We are also subject to the risks generally associated with new product introductions and applications, including lack of market acceptance, delays in product development or production, and failure of products to operate properly. If we are unable to react to changes in the marketplace, including the potential introduction of technologies such as autonomous vehicles, our financial performance could be adversely affected.

We may fail to realize all of the anticipated benefits of the Federal-Mogul Acquisition or those benefits may take longer to realize than expected. We and, following the planned separation of our businesses, each separate company may also encounter significant difficulties in completing the integration of Federal-Mogul's business.
Our success will depend, in part, on our ability (and the ability of each separate company following the planned separation) (defined below) to realize the anticipated benefits of the Federal-Mogul Acquisition and on our (and each separate company's) ability to complete the integration of Federal-Mogul's business in an effective and efficient manner, which is and has been a complex, costly and time-consuming process. The integration process may disrupt business and, if we are unable to successfully complete the integration of Federal-Mogul's business, we (and each separate company) could fail to realize the anticipated benefits of the Federal-Mogul Acquisition. The failure to meet the challenges involved in the integration process and realize the anticipated benefits of the Federal-Mogul Acquisition could cause an interruption of, or a loss of momentum in, our operations and could have a material adverse effect on our (and each separate company's) business, financial condition and results of operations.

In addition, the integration of Federal-Mogul may result in material unanticipated challenges, expenses, liabilities, competitive responses and loss of customers and other business relationships. Additional integration challenges include:
- diversion of management's attention to integration matters;
- challenges in learning day-to-day operations of a new business with new management and teams;
- difficulties in sustaining achieved cost savings, synergies, business opportunities and growth prospects from the Federal-Mogul Acquisition;
- unforeseen difficulties post the integration of operations and systems, including the risk that information technology-enabled process transformations do not achieve the desired levels of process efficiency, customer satisfaction and/or expected business benefits;
- difficulties in conforming standards, controls, procedures and accounting and other policies, business cultures and compensation structures;
- difficulties in the assimilation of employees;
- difficulties in managing the expanded operations of a significantly larger and more complex company;
- challenges in attracting and retaining key personnel;
- the impact of potential liabilities we may be inheriting from Federal-Mogul; and
- coordinating a geographically dispersed organization.

Many of these factors are outside of our control and could result in increased costs, decreases in the amount of anticipated revenues and diversion of management's time and energy, each of which could adversely affect our (and each separate company's) business, financial condition and results of operations.

In addition, even if the integration of Federal-Mogul's business is successful, we (and each separate company) may not realize all of the anticipated benefits of the Federal-Mogul Acquisition, including the sustainability of synergies and cost savings; or realization of the sales and growth opportunities we identified. These benefits may not be achieved within the anticipated time frame, or at all. Further, additional unanticipated costs may be incurred in finalizing the integration process. All of these factors could cause reductions in earnings per share, decrease or delay the expected accretive effect of the Federal-Mogul Acquisition and negatively impact the price of shares of our class A common stock (or each separate company's stock). As a result, we cannot ensure the Transaction will result in the realization of the anticipated benefits and the sustainability of the synergies.

Any acquisitions we make could disrupt our business and seriously harm our financial condition.
We may, from time to time, consider acquisitions of complementary companies, products or technologies. Acquisitions involve numerous risks, including difficulties in the assimilation of the acquired businesses, the diversion of our management's attention from other business concerns and potential adverse effects on existing business relationships with customers and suppliers. In addition, any acquisitions could involve the incurrence of substantial additional indebtedness. We cannot assure you that we will be able to successfully integrate any acquisitions that we pursue or that such acquisitions, and the potential related synergies, will perform as planned or prove to be beneficial to our operations and cash flow, or deliver any anticipated strategic benefits. Any such failure could seriously harm our business, financial condition and results of operations.

Certain of our operations are conducted through joint ventures, which have unique risks.
Certain of our operations are conducted through joint ventures. Our joint ventures are governed by mutually established agreements that we entered into with our partners, and, as such, we do not unilaterally control the joint ventures. There is a risk that our partners' objectives for the joint ventures may not be aligned with ours, leading to potential disagreements over management of the joint ventures. At some of our joint ventures, our joint venture partner is also affiliated with the largest customer of the joint venture, which may create a conflict between the interests of our partner and the joint venture. Also, our ability to sell our interest in a joint venture may be subject to contractual and other limitations.

Additional risks associated with joint ventures include our partners failing to satisfy contractual obligations, conflicts arising between us and any of our partners, a change in the ownership of any of our partners and our limited ability to control compliance with applicable rules and regulations. Accordingly, any such occurrences could adversely affect our financial condition, operating results and cash flows.

We are subject to risks related to operating a multi-national company.
We have manufacturing and distribution facilities in many regions across six continents. For the fiscal year ended December 31, 2019, a significant portion of our net sales were derived from operations outside North America. Current events including the possibility of renegotiated trade deals and international tax law treaties, create a level of uncertainty, and potentially increased complexity, for multi-national companies. These uncertainties could have a material adverse effect on our business and our results of operations and financial condition. In addition, international operations are subject to various risks which could have a material adverse effect on those operations or our business as a whole, including:

- currency exchange rate fluctuations, including those in countries with hyperinflationary economies;
- exposure to local economic conditions and labor issues;
- exposure to local political conditions, including the risk of seizure of assets by a foreign government;
- exposure to local social conditions, including corruption and any acts of war, terrorism or similar events;
- exposure to local public health issues and the resultant impact on economic and political conditions;
- inflation in certain countries;
- limitations on the repatriation of cash, including imposition or increase of withholding and other taxes on remittances and other payments by foreign subsidiaries;
- retaliatory tariffs and restrictions limiting free movement of goods and an unfavorable trade environment, including as a result of political conditions and changes in the laws in the United States and elsewhere and as described in more details below; and
- requirements for manufacturers to use locally produced goods.

Natural disasters, local and global public health emergencies, political crises, and other catastrophic events or other events outside of our control may affect our facilities or the facilities of third parties on which we depend and could impact our business and our results of operations and financial condition. We cannot currently predict the extent to which the coronavirus outbreak will impact our business, results of operations or financial condition.
If any of our facilities or the facilities of our suppliers, third-party service providers, or customers, is affected by natural disasters (such as earthquakes, tornados, tsunamis, power shortages or outages, floods or monsoons), public health crises (such as pandemics and epidemics), political crises (such as terrorism, war, political instability or other conflict), or other events outside of our control, our business and our results of operations and financial condition could suffer. Any such disruption could cause delays in the production and distribution of our products and the loss of sales and customers. Moreover, these types of events could negatively impact consumer spending or the economy in the impacted regions or depending upon the severity, globally, which could adversely impact our business and our results of operations and financial condition. For example, in December 2019, a strain of coronavirus surfaced in Wuhan, China, which has resulted in plant closures in China, supply chain disruptions, restrictions on travel to China, and a decrease in consumer traffic in China. The coronavirus has spread to multiple countries around the world and we are carefully monitoring the potential impact of the coronavirus in these other countries. The impact to the supply chain as a result of the coronavirus outbreak could further impact production at our and our customers'

sites in China, as well as affect production at our and our customers' sites outside of China. We presently believe the impact of lost production in the first quarter of 2020 as a result of the coronavirus will be $150 million on value-add revenue and $50 million on EBITDA. However, the coronavirus outbreak continues to spread as of the date of this report and, accordingly, we cannot predict the extent to which the coronavirus will ultimately affect our business, results of operations or financial condition.

Entering new markets poses new competitive threats and commercial risks.
As we have expanded into markets beyond light vehicles, we expect to diversify our product sales by leveraging technologies being developed for the light vehicle segment. Such diversification requires investments and resources which may not be available as needed. We cannot guarantee that we will be successful in leveraging our capabilities into new markets and thus, in meeting the needs of these new customers and competing favorably in these new markets. Further, a significant portion of our growth potential is dependent on our ability to increase sales to commercial truck and off-highway vehicle customers. While we believe that we can achieve our growth targets with the production contracts that have been or will be awarded to us, our future prospects will be negatively affected if those customers underlying these contracts experience reduced demand for their products, or financial difficulties.

We have recorded a significant amount of long-lived assets, goodwill, and other intangible assets, which may become impaired in the future and negatively affect our operating results.
We have recorded a significant amount of long-lived assets, goodwill, and other identifiable intangibles assets, including customer relationships, trademarks and brand names, and developed technologies due to the Federal-Mogul Acquisition. Long lived assets, goodwill, and other identifiable intangible assets were approximately $2.2 billion as of December 31, 2019, or 17% of our total assets. Under generally accepted accounting principles in the United States, long-lived assets, excluding goodwill and indefinite lived intangible assets, are required to be evaluated for impairment whenever adverse events or changes in circumstances indicate a possible impairment. If business conditions or other factors cause profitability and cash flows to decline, we may be required to record non-cash impairment charges. Goodwill and indefinite lived intangible assets must be evaluated for impairment annually or more frequently if events indicate it is warranted. Impairment of goodwill and other identifiable intangible assets may result from, among other things, deterioration in our performance, adverse market conditions, adverse changes in applicable laws or regulations, including changes that restrict the activities of or affect the products sold by our business, and a variety of other factors. The amount of any quantified impairment must be expensed immediately and could have a material adverse effect on our financial statements in the event that long lived assets, goodwill or other identifiable intangible assets become impaired.

The value of our deferred tax assets may not be realized, which could materially and adversely affect our operating results.
As of December 31, 2019, we had approximately $501 million in net deferred tax assets. These deferred tax assets include net operating loss carryovers and tax credits that can be used to offset taxable income in future periods and reduce income taxes payable in those future periods. Each quarter, we determine the probability of the realization of deferred tax assets, using significant judgments and estimates with respect to, among other things, historical operating results and expectations of future earnings and tax planning strategies. If we determine in the future that there is not sufficient positive evidence to support the valuation of these assets, due to the risk factors described herein or other factors, we may be required to further adjust the valuation allowance to reduce our deferred tax assets. Such a reduction could result in material non-cash expenses in the period in which the valuation allowance is adjusted and could have a material adverse effect on our financial statements.

Our expected annual effective tax rate could be volatile and materially change as a result of changes in mix of earnings and other factors.
Our overall effective tax rate is equal to our total tax expense as a percentage of our total profit or loss before tax. However, tax expenses and benefits are determined separately for each tax paying entity or group of entities that is consolidated for tax purposes in each jurisdiction. Losses in certain jurisdictions may provide no current financial statement tax benefit. As a result, changes in the mix of profits and losses between jurisdictions, among other factors, could have a significant impact on our overall effective tax rate.

Changes in tax law or trade agreements and new or changed tariffs could have a material adverse effect on us.
Changes in U.S. political, regulatory and economic conditions and/or changes in laws and policies governing U.S. tax laws, foreign trade (including trade agreements and tariffs), manufacturing, and development and investment in the territories and countries where we and/or our customers operate could adversely affect our operating results and business.

For example, on December 22, 2017, the U.S. President signed into law new legislation that significantly revised the U.S. Internal Revenue Code. The newly enacted federal income tax law, among other things, contains significant changes to corporate taxation, including the reduction of the corporate income tax rate from a top marginal rate of 35% to a flat rate of

21%, a one-time transition tax on offshore earnings at reduced tax rates regardless of whether the earnings are repatriated, elimination of U.S. tax on foreign dividends (subject to certain important exceptions), new taxes on certain foreign earnings, a new minimum tax related to payments to foreign subsidiaries and affiliates, immediate deductions for certain new investments as opposed to deductions for depreciation expense over time, and the modification or repeal of many business deductions and credits.

In addition, the United States, Mexico and Canada have renegotiated the North American Free Trade Agreement ("NAFTA"). The revised agreement, the US-Mexico-Canada Agreement ("USMCA"), contains new and revised provisions that alter the prior rules governing when imports and exports of autos and auto parts are eligible for duty-free treatment. Generally, these new rules require a higher percentage of the overall content of the auto or autopart to originate in one of the USMCA's countries (the U.S., Mexico or Canada). The U.S. Congress has approved the USMCA, and the President signed it into law on January 29, 2020. The USMCA will go into effect 90 days after it is ratified by Canada. Our manufacturing facilities in the U.S., Mexico and Canada are dependent on duty-free trade within the USMCA region. We have significant movement of goods within NAFTA region, and the imposition of customs duties on imports could negatively impact our financial performance.

Moreover, in March 2018, the U.S. government imposed a 25% *ad valorem* tariff on certain steel imports and a 10% *ad valorem* tariff on certain aluminum imports. These tariffs (known as "Section 232 tariffs") apply to certain steel and aluminum imports from almost all countries. In addition, over the course of 2018 and 2019, the U.S. government imposed additional tariffs on products from China valued at $550 billion (with some limited exceptions). As of October 2, 2019, the additional ad valorem tariff will be 30% on $250 billion of those imports, with the remainder at 15% at the end of 2019. As a result of the tariffs, China and other countries have implemented retaliatory actions with respect to U.S. imports into their countries, which could adversely affect our business, financial condition or results of operations.

Further, in May 2019, the U.S. President determined that imported automobiles and automotive parts pose a national security threat to the United States. While no additional tariffs have been imposed due to this decision (due to on-going international discussions), certain aspects of our business depend on the importation of automotive parts from outside of the U.S. If these or other similar tariffs are imposed, our business and results of operations could be materially adversely affected.

The Company's pension obligations and other postretirement benefits assumed as a result of the Federal-Mogul Acquisition could adversely affect the Company's operating margins and cash flows.
Following completion of the Federal-Mogul Acquisition, pension and other postretirement benefit obligations have increased. The automotive industry, like other industries, continues to be affected by the rising cost of providing pension and other postretirement benefits. In addition, the Company sponsors certain defined benefit plans worldwide that are underfunded and will require cash payments. If the performance of the assets in the pension plans does not meet the Company's expectations, or other actuarial assumptions are updated, the Company's required contributions may be higher than it expects.

The Company's hedging activities to address commodity price fluctuations may not be successful in offsetting future increases in those costs or may reduce or eliminate the benefits of any decreases in those costs.
In order to mitigate short-term variation in operating results due to the aforementioned commodity price fluctuations, the Company hedged a portion of near-term exposure to certain raw materials used in production processes, primarily copper, nickel, tin, zinc, high-grade aluminum and aluminum alloy. The results of this hedging practice could be positive, neutral or negative in any period depending on price changes in the hedged exposures.

Our hedging activities are not designed to mitigate long-term commodity price fluctuations and, therefore, will not protect from long-term commodity price increases. Our future hedging positions may not correlate to actual raw materials costs, which would accelerate the recognition in our operating results of unrealized gains and losses on hedging positions.

If we cannot attract, retain, and motivate employees, we may be unable to compete effectively, and lose the ability to improve and expand our businesses.
Our success and ability to grow depends, in part, on our ability to hire, retain, and motivate sufficient numbers of talented people with the increasingly diverse skills needed to serve clients and expand our business in many locations around the world. We face intense competition for highly qualified, specialized technical, managerial and other personnel. Recruiting, training, retention, and benefit costs place significant demands on our resources. The inability to attract qualified employees in sufficient numbers to meet particular demands or the loss of key management employees or a significant number of our employees could have an adverse effect on us.

We have identified a material weakness in our internal control over financial reporting which could, if not remediated, result in material misstatements in our financial statements.
Management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rule 13a-15(f) under the Securities Exchange Act of 1934, as amended. As disclosed in Part II, Item 8, management identified a material weakness in internal control over financial reporting as we did not maintain a sufficient complement of resources in our North America Motorparts business to ensure that appropriate controls were designed, maintained and executed, including controls over account reconciliations and manual journal entries, related to the integration of a previously acquired entity within the North America Motorparts business. During 2019, the continued integration of the Federal-Mogul acquisition increased the complexity and level of certain financial reporting activities within the North America Motorparts business, without a corresponding change in centralized resource levels. A material weakness (as defined in Rule 12b-2) is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of annual or interim financial statements will not be prevented or detected on a timely basis. As a result of this material weakness, management concluded that internal control over financial reporting was not effective based on criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in "Internal Control-An Integrated Framework (2013)." We have designed, and are implementing, a remediation plan to address this material weakness. If remedial measures are insufficient to address the material weakness, or if additional material weaknesses in internal control are discovered or occur in the future, our consolidated financial statements may contain material misstatements and we could be required to restate our financial results.

Risks Relating to the Planned Separation of our Businesses

The planned separation of our businesses is subject to various risks and uncertainties and may not be completed in accordance with the expected plans or anticipated timeline, or at all, and will involve significant time and expense, which could disrupt or adversely affect our business.
Following the closing of the Federal-Mogul Acquisition, we agreed to use our reasonable best efforts to pursue the separation of the combined company to form two new, independent, publicly traded companies, a new Powertrain Technology company ("New Tenneco") and an Aftermarket and Ride Performance company ("DRiV"). During 2020, we will be focused on the execution of our accelerated performance improvement plan to facilitate the expected separation of New Tenneco and DRiV. Current end-market conditions are affecting our ability to complete a separation in the mid-year 2020 time range. We expect that these trends will continue throughout this year. We have made significant progress to facilitate the planned spin-off of the DRiV business and have completed all necessary system and process components required for New Tenneco and DRiV to operate independently. In this respect, we are ready to separate the businesses as soon as favorable conditions are present. In order to facilitate the separation, we continue to evaluate multiple strategic alternatives, as well as options to deleverage and mitigate the ongoing impact of challenging market conditions.

The planned spin-off is intended to be treated as a tax-free reorganization for U.S. federal income tax purposes. There can be no assurance that the planned Spin-Off or other separation of our businesses will be completed at all or that the planned spin-off will be tax-free for U.S. federal income purposes. We expect that the process of completing the planned separation will be time consuming and involve significant costs and expenses, which may be significantly higher than what we currently anticipate and may not yield a benefit if the planned separation is not completed. We may encounter unforeseen impediments to the completion of the planned separation that render it impossible or impracticable.

If the planned separation is not completed, our business, financial condition and results of operations may be materially adversely affected, and the market price of our class A common stock may decline significantly, particularly to the extent that the current market price reflects a market assumption that the planned separation will be completed. If the completion of the planned separation is delayed, including by the receipt of an acquisition proposal, our business, financial condition and results of operations may be materially adversely affected.

The planned separation could adversely affect our business, financial results and operations.
The planned separation of our businesses could cause disruptions and create uncertainty surrounding our business and affect our relationships with our customers, suppliers and employees.

As a result of planned separation, some customers, suppliers or strategic partners may terminate their business relationship with us. Potential customers, suppliers or strategic partners may delay entering into, or decide not to enter into, a business relationship with us because of planned separation. If customer or supplier relationships or strategic alliances are adversely affected by the planned separation, our (and each separate company's after the planned separation) business, financial condition and results of operations could be adversely affected.

We are dependent on the experience and industry knowledge of our officers and other key employees to execute our business plans. Our success after and in implementing the planned separation depends in part upon the ability to retain key management personnel and other key employees. Current and prospective employees of the Company may experience uncertainty about their roles with either separate company following the planned separation, or concerns regarding operations following the separation, any of which may have an adverse effect on the ability to attract or retain key management and other key personnel. Accordingly, no assurance can be given that we (or each separate company after the planned separation) will be able to attract or retain key management personnel and other key employees to the extent that we have previously been able to attract or retain such employees.

In addition, we have diverted, and will continue to divert, significant management resources to complete the planned separation, which could adversely impact our ability to manage existing operations or pursue alternative strategic transactions, which could adversely affect our business, financial condition and results of operations.

The planned separation of our businesses may not achieve some or all of the anticipated benefits.
We may not realize some or all of the anticipated strategic, financial, operational or other benefits from the planned separation of our businesses. As new independent companies, the two companies will be smaller, less diversified companies with a narrower business focus. As a result, the two companies may be more vulnerable to changing market conditions, which could result in increased volatility in their cash flows, working capital and financing requirements and could have a material adverse effect on the respective business, financial condition and results of operations of each company. Further, there can be no assurance that the combined value of the common stock of the two companies will be equal to or greater than what the value of our common stock would have been had the planned separation not occurred.

If the planned separation is completed, each separate company following the separation may underperform relative to our expectations.
If the planned separation is completed, each separate company may not be able to maintain the growth rate, levels of revenue, earnings or operating efficiency that we achieved or might achieve as a combined company. The failure to do so could have a material adverse effect on the business, financial condition and results of operations of each separate company.

We have incurred, and will continue to incur, significant transaction costs in connection with the planned separation that could adversely affect our results of operations.
We have incurred, and will continue to incur, significant costs in connection with integrating the business and operations of Federal-Mogul with our business and operations and effectuating the planned separation. We may also incur additional unanticipated costs in the separation processes. These could adversely affect our business, financial condition and results of operations, or the business, financial condition and results of operations of each company following the planned separation, in the period in which such expenses are recorded, or the cash flows, in the period in which any related costs are actually paid.

Furthermore, we and each company following the planned separation may incur material restructuring charges in connection with integration activities or the planned separation, which may adversely affect operating results for the period in which such expenses are recorded, or cash flows in the period in which any related costs are actually paid.

We may incur greater costs following the planned separation of our businesses, which could decrease our profitability.
Our businesses are operating in conjunction with one another, allowing us in certain circumstances to take advantage of the combined businesses' size and purchasing power in procuring certain goods and services. After the planned separation of our businesses we may be unable to obtain goods and services at prices or on terms as favorable to us as those we obtained prior to the planned separation. Our businesses also benefit from certain shared functions and services. Following the planned separation, we will retain some of these functions and services, and DRiV Incorporated will retain some of these functions and services.

We could incur substantial additional costs and experience temporary business interruptions to transition information technology infrastructure in connection with the planned separation.
We may incur temporary interruptions in business operations if we and DRiV cannot transition effectively from the existing transactional and operational systems and data centers retained by the other, or from the transition services that support these functions. We may not be successful in implementing new systems and transitioning data, and we may incur substantially higher costs for implementation than currently anticipated. Our failure to avoid operational interruptions as we implement any necessary new systems, our failure to implement any new systems and replace services successfully, or the insufficiency of our business continuity and disaster recovery capabilities in the event of a disruption of our information technology services, could disrupt our business and have a material adverse effect on our profitability. In addition, if we are unable to replicate or transition certain systems, our ability to comply with regulatory requirements could be impaired.

DRiV may not satisfy its obligations under various agreements that have been or will be executed as part of the planned spin-off.
In connection with the planned spin-off, we and DRiV will enter various agreements that govern the allocation of assets and liabilities between the two company and other matters. Included among these agreements will be a Separation and Distribution Agreement, Employee Matters Agreement, Transition Services Agreement, Tax Matters Agreement, Intellectual Property Matters Agreement and certain other agreements. Certain of these agreements will provide for the performance of services by each company for the benefit of the other for a period of time after the planned spin-off. We will rely on DRiV to satisfy its performance and payment obligations under these agreements. If DRiV is unable to satisfy its obligations under these agreements, including its indemnification obligations, we could incur operational difficulties or losses.

There could be significant liability if the planned spin-off is determined to be a taxable transaction.
A condition to the planned spin-off is our receipt of an opinion from certain tax advisors with respect to certain U.S. federal income tax consequences of the DRiV spin-off, each of which is in substance and form satisfactory to us. The opinion is expected to conclude that the planned spin-off of 100% of the outstanding DRiV shares to our stockholders and certain related transactions will qualify as tax-free to us and our stockholders under Sections 355 and 368 of the Internal Revenue Code, except to the extent of any cash received in lieu of fractional shares of DRiV's common stock. Any such opinion is not binding on the U.S. Internal Revenue Service ("IRS"). Accordingly, the IRS may reach conclusions with respect to DRiV that are different from the conclusions reached in the opinion. The opinion will rely on certain facts, assumptions, representations and undertakings from us and DRiV regarding the past and future conduct of the companies' respective businesses and other matters, which, if incomplete, incorrect or not satisfied, could alter the conclusions of the party giving such opinion or ruling.

If the planned spin-off ultimately is determined to be taxable, the spin-off could be treated as a taxable dividend to our stockholders for U.S. federal income tax purposes, and our stockholders could incur significant U.S. federal income tax liabilities. In addition, we would recognize a taxable gain to the extent that the fair market value of DRiV common stock exceeds our tax basis in such stock on the date of the planned Spin-Off. The Tax Matters Agreement we will enter into with DRiV will address which company is responsible for any taxes imposed as a result of the planned Spin-Off.

Our current stockholders may have reduced ownership and voting interests following the exercise of certain rights under the Purchase Agreement and exercise less influence over management.
We have granted certain registration rights to AEP for the resale of the shares issued in connection with the Federal-Mogul Acquisition. These registration rights would facilitate the resale of such shares into the public market, and any such resale would increase the number of shares of our Class A Common Stock available for public trading. Sales of a substantial number of shares of our Class A Common Stock in the public market, or the perception that such sales might occur, could have a material adverse effect on the price of our Class A Common Stock.

If AEP transfers any shares of its Class B Common Stock to a third-party, the shares of Class B Common Stock so transferred will automatically convert in shares of Class A Common Stock. In addition, if we do not consummate (or abandon) the proposed Spin-Off by April 1, 2020, each holder of Class B Common Stock may convert a number of such shares into an equal number of shares of Class A Common Stock, provided that such conversion would not result in such holder, AEP, IEH, IEP and any of their affiliates owning, in the aggregate, more than 15 percent of the Class A Common Stock issued and outstanding immediately following such conversion. If AEP transfers any shares of its Class B Common Stock to a third party, or if AEP converts its shares following April 1, 2020, our current stockholders will experience a proportionate reduction in voting power.

Our business could be adversely impacted as a result of actions by activist stockholders, including potential proxy contests.
We value constructive input from investors and regularly engage in dialogue with our stockholders regarding strategy and performance. The Board of Directors and management team are committed to acting in the best interests of all of our stockholders. There can be no assurance, however, that the actions taken by the Board of Directors and management in seeking to maintain constructive engagement with our stockholders will be successful, and we may be subject to formal or informal actions or requests from stockholders or others. Responding to such actions could be costly and time-consuming, divert the attention and resources of management and employees, and may have an adverse effect on our business, results of operations and cash flow and the market price of our common stock.

Uncertainties related to, or the results of, any actions by activist stockholders could cause our stock price to experience periods of volatility. We cannot predict, and no assurances can be given as to the outcome or timing of any matters relating to actions by activist stockholders or the ultimate impact on our business, liquidity, financial condition or results of operations.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

ITEM 2. PROPERTIES.

We lease our principal executive offices, which are located at 500 North Field Drive, Lake Forest, Illinois, 60045.

	Reportable Segments				
	Clean Air	Powertrain	Ride Performance	Motorparts	Total
Manufacturing plants:					
North America	15	23	11	8	57
Europe	19	34	14	3	70
South America	2	5	3	2	12
Asia Pacific	23	23	12	4	62
	59	85	40	17	201
Engineering and technical facilities	7	14	19	5	45
Distribution centers and warehouses	—	—	—	56	56
Total as of December 31, 2019	66	99	59	78	302
Lease	42	25	28	48	143
Own	24	74	31	30	159
Total	66	99	59	78	302

Our manufacturing facilities are located in Argentina, Australia, Belgium, Brazil, Canada, China, Czech Republic, France, Germany, Hungary, India, Italy, Japan, Mexico, Morocco, Poland, Portugal, Romania, Russia, South Africa, South Korea, Spain, Sweden, Thailand, the United Kingdom, the United States, and Vietnam.

Within our manufacturing facilities listed above, we operate 36 joint ventures in which we own a controlling interest. In addition, we have numerous joint ventures in which we hold a noncontrolling interest that operate manufacturing facilities primarily in China, Turkey, and the United States, which are not included in the table above.

We also have warehouses and distribution facilities at our manufacturing sites and a few off-site locations, substantially all of which we lease, and a network of 10 technical support centers that provide some of the most comprehensive training programs in the industry that educate our partners and customers with emerging vehicle technologies and vehicle repair operational skills.

We believe that substantially all of our plants and equipment are, in general, well maintained and in good operating condition. They are considered adequate for present needs and, as supplemented by planned construction, are expected to remain adequate for the near future.

We also believe that we generally have satisfactory title to the properties owned and used in our respective businesses. In the United States, substantially all of our owned real property is pledged to secure our obligations under our senior credit facility.

ITEM 3. LEGAL PROCEEDINGS.

We are involved in environmental remediation matters, legal proceedings, claims (including warranty claims), and investigations. These matters are typically incidental to the conduct of our business and create the potential for contingent losses. We accrue for potential contingent losses when our review of available facts indicates that it is probable a loss has been incurred and the amount of the loss is reasonably estimable. Each quarter, we assess our loss contingencies based upon currently available facts, existing technology, presently enacted laws and regulations, and taking into consideration the likely effects of inflation and other societal and economic factors and record adjustments to these reserves as required. As an example, we consider all available evidence, including prior experience in remediation of contaminated sites, other companies' cleanup experiences and data released by the U.S. Environmental Protection Agency or other organizations when we evaluate our environmental remediation contingencies. All of our loss contingency estimates are subject to revision in future periods based on actual costs or new information. With respect to our environmental liabilities, where future cash flows are fixed or reliably determinable, we have discounted those liabilities. We evaluate recoveries separately from the liability and, when they are assured, recoveries are recorded and reported separately from the associated liability in our consolidated financial statements.

Environmental Matters
We are subject to a variety of environmental and pollution control laws and regulations in all jurisdictions in which we operate. We have been notified by the U.S. Environmental Protection Agency, other national environmental agencies, and various provincial and state agencies that we may be a potentially responsible party ("PRP") under such laws for the cost of remediating hazardous substances pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") and other national and state or provincial environmental laws. PRP designation typically requires the funding of site investigations and subsequent remedial activities. Many of the sites that are likely to be the costliest to remediate are often current or former commercial waste disposal facilities to which numerous companies sent wastes. Despite the potential joint and several liability which might be imposed on us under CERCLA and some of the other laws pertaining to these sites, our share of the total waste sent to these sites generally has been small. We believe our exposure for liability at these sites is limited.

On a global basis, we have also identified certain other present and former properties at which we may be responsible for cleaning up or addressing environmental contamination, in some cases as a result of contractual commitments and/or federal or state environmental laws. We are actively seeking to resolve these actual and potential statutory, regulatory, and contractual obligations.

We expense or capitalize, as appropriate, expenditures for ongoing compliance with environmental regulations. As of December 31, 2019, we have the obligation to remediate or contribute towards the remediation of certain sites, including the sites discussed above at which we may be a PRP. Our aggregated estimated share of environmental remediation costs for all these sites on a discounted basis was approximately $36 million as of December 31, 2019, of which $8 million is recorded in accrued expenses and other current liabilities and $28 million is recorded in deferred credits and other liabilities in our consolidated balance sheets. For those locations where the liability was discounted, the weighted average discount rate used was 1.3%. The undiscounted value of the estimated remediation costs was $40 million as of December 31, 2019. Our expected payments of environmental remediation costs for non-indemnified locations are estimated to be approximately $7 million in 2020, $4 million in 2021, $3 million in 2022 and $2 million in both 2023 and 2024, and $15 million in aggregate thereafter.

In addition to amounts described above, we estimate that we will make expenditures for property, plant and equipment for environmental matters of approximately $15 million in 2020 and $17 million in 2021.

Based on information known to us from site investigations and the professional judgment of consultants, we have established reserves that we believe are adequate for these costs. Although we believe these estimates of remediation costs are reasonable and are based on the latest available information, the costs are estimates, difficult to quantify based on the complexity of the issues, and are subject to change as more information becomes available about the extent of remediation required. At some sites, we expect that other parties will contribute to the remediation costs. In addition, certain environmental statutes provide that our liability could be joint and several, meaning that we could be required to pay amounts in excess of our share of remediation costs. The financial strength of other PRPs at these sites has been considered, where appropriate, in our determination of our estimated liability. We do not believe that any potential costs associated with our current status as a PRP, or as a liable party at the other locations referenced herein, will be material to our annual consolidated financial position, results of operations, or liquidity.

Antitrust Investigations and Litigation
On March 25, 2014, representatives of the European Commission (EC) were at Tenneco GmbH's Edenkoben, Germany administrative facility to gather information in connection with an ongoing global antitrust investigation concerning multiple

automotive suppliers. On the same date, we also received a related subpoena from the U.S. Department of Justice ("DOJ").

On November 5, 2014, the DOJ granted conditional leniency to Tenneco, its subsidiaries and its 50% affiliates as of such date ("2014 Tenneco Entities") pursuant to an agreement we entered into under the Antitrust Division's Corporate Leniency Policy. This agreement provides important benefits to the 2014 Tenneco Entities in exchange for our self-reporting of matters to the DOJ and our continuing full cooperation with the DOJ's resulting investigation. For example, the DOJ will not bring any criminal antitrust prosecution against the 2014 Tenneco Entities, nor seek any criminal fines or penalties, in connection with the matters we reported to the DOJ. Additionally, there are limits on the liability of the 2014 Tenneco Entities related to any follow-on civil antitrust litigation in the United States. The limits include single rather than treble damages, as well as relief from joint and several antitrust liability with other relevant civil antitrust action defendants. These limits are subject to us satisfying the DOJ and any court presiding over such follow-on civil litigation.

On April 27, 2017, we received notification from the EC that it has administratively closed its global antitrust inquiry regarding the production, assembly, and supply of complete exhaust systems. No charges against us or any other competitor were initiated at any time and the EC inquiry is now closed.

Certain other competition agencies are also investigating possible violations of antitrust laws relating to products supplied by us and our subsidiaries, including Federal-Mogul. We have cooperated and continue to cooperate fully with all of these antitrust investigations, and have taken other actions to minimize our potential exposure.

The Company and certain of its competitors are also currently defendants in civil putative class action litigation and are subject to similar claims filed by other plaintiffs, in the United States and Canada. More related lawsuits may be filed, including in other jurisdictions. Plaintiffs in these cases generally allege that defendants have engaged in anticompetitive conduct, in violation of federal and state laws, relating to the sale of automotive exhaust systems or components thereof. Plaintiffs seek to recover, on behalf of themselves and various purported classes of purchasers, injunctive relief, damages and attorneys' fees. However, as explained above, because the DOJ granted conditional leniency to the 2014 Tenneco Entities, our civil liability in United States follow-on actions with respect to these entities is limited to single damages and we will not be jointly and severally liable with the other defendants, provided that we have satisfied our obligations under the DOJ leniency agreement and approval is granted by the presiding court. Typically, exposure for follow-on actions in Canada is less than the exposure for U.S. follow-on actions.

Following the EC's decision to administratively close its antitrust inquiry into exhaust systems in 2017, receipt by the 2014 Tenneco Entities of conditional leniency from the DOJ and discussions during the third quarter of 2017 following the appointment of a special settlement master in the civil putative class action cases pending against the Company and/or certain of its competitors in the United States, the Company continues to vigorously defend itself and/or take actions to minimize its potential exposure to matters pertaining to the global antitrust investigation, including engaging in settlement discussions when it is in the best interests of the Company and its stockholders. For example, in October 2017, we settled an administrative action brought by Brazil's competition authority for an amount that was not material. In December 2018, we settled a separate administrative action brought by Brazil's competition authority against a Federal-Mogul subsidiary, also for an amount that was not material.

Additionally, in February 2018, we settled civil putative class action litigation in the United States brought by classes of direct purchasers, end-payors and auto dealers. No other classes of plaintiffs have brought claims against us in the United States. Based upon earlier developments, including settlement discussions, we established a reserve of $132 million in our second quarter 2017 financial results for settlement costs that were probable, reasonably estimable, and expected to be necessary to resolve our antitrust matters globally, which primarily involves the resolution of civil suits and related claims. Of the $132 million reserve that was established, $79 million was paid through December 31, 2019. In connection with the resolution of certain claims, $9 million was released as a change in estimate from the reserve in the third quarter of 2019 and a payment of $30 million was made in the first quarter of 2020 from amounts that were included in the reserve. At December 31, 2019, the total remaining reserve was $44 million, of which $30 million was recorded in accrued expenses and other current liabilities and $14 million was recorded deferred credits and other liabilities in the consolidated balance sheets. While the Company, including its Federal-Mogul subsidiaries, continues to cooperate with certain competition agencies investigating possible violations of antitrust laws relating to products supplied by the Company, and the Company may be subject to other civil lawsuits and/or related claims, no amount of this reserve is attributable to matters with the DOJ or the EC, and no such amount is expected based on current information.

Our reserve for antitrust matters is based upon all currently available information and an assessment of the probability of events for those matters where we can make a reasonable estimate of the costs to resolve such outstanding matters. Our estimate involves significant judgment, given the number, variety and potential outcomes of actual and potential claims, the uncertainty of future rulings and approvals by a court or other authority, the behavior or incentives of adverse parties or regulatory authorities, and other factors outside of our control. As a result, our reserve may change from time to time, and actual costs may vary. Although the ultimate outcome of any legal matter cannot be predicted with certainty, based on current information, we do not expect that any such change in the reserve will have a material adverse effect on our annual consolidated financial position, results of operations or liquidity.

Other Legal Proceedings, Claims and Investigations
For many years we have been and continue to be subject to lawsuits initiated by claimants alleging health problems as a result of exposure to asbestos. Our current docket of active and inactive cases is less than 500 cases in the United States and less than 50 in Europe.

With respect to the claims filed in the United States, the substantial majority of the claims are related to alleged exposure to asbestos in our line of Walker® exhaust automotive products although a significant number of those claims appear also to involve occupational exposures sustained in industries other than automotive. A small number of claims have been asserted against one of our subsidiaries by railroad workers alleging exposure to asbestos products in railroad cars. We believe, based on scientific and other evidence, it is unlikely that U.S. claimants were exposed to asbestos by our former products and that, in any event, they would not be at increased risk of asbestos-related disease based on their work with these products. Further, many of these cases involve numerous defendants. Additionally, in many cases the plaintiffs either do not specify any, or specify the jurisdictional minimum, dollar amount for damages.

With respect to the claims filed in Europe, the substantial majority relate to occupational exposure claims brought by current and former employees of Federal-Mogul facilities in France and amounts paid out were not material. A small number of occupational exposure claims have also been asserted against Federal-Mogul entities in Italy and Spain.

As major asbestos manufacturers and/or users continue to go out of business or file for bankruptcy, we may experience an increased number of these claims. We vigorously defend ourselves against these claims as part of our ordinary course of business. In future periods, we could be subject to cash costs or charges to earnings if any of these matters are resolved unfavorably to us. To date, with respect to claims that have proceeded sufficiently through the judicial process, we have regularly achieved favorable resolutions. Accordingly, we presently believe that these asbestos-related claims will not have a material adverse effect on our annual consolidated financial position, results of operations or liquidity.

In connection with Federal-Mogul's emergence from bankruptcy in 2008, trusts were funded and established to assume liability for and resolve Federal-Mogul's legacy asbestos liabilities in the United States and United Kingdom. Accordingly, those legacy liabilities in the United States and United Kingdom have had no ongoing impact on Federal-Mogul, Tenneco or their operations.

We are also from time to time involved in other legal proceedings, claims or investigations. Some of these matters involve allegations of damages against us relating to environmental liabilities (including toxic tort, property damage and remediation), intellectual property matters (including patent, trademark and copyright infringement, and licensing disputes), personal injury claims (including injuries due to product failure, design or warning issues, and other product liability related matters), taxes, unclaimed property, employment matters, and commercial or contractual disputes, sometimes related to acquisitions or divestitures. Additionally, some of these matters involve allegations relating to legal compliance.

While we vigorously defend ourselves against all of these legal proceedings, claims and investigations and take other actions to minimize our potential exposure, in future periods, we could be subject to cash costs or charges to earnings if any of these matters are resolved on unfavorable terms. Although the ultimate outcome of any legal matter cannot be predicted with certainty, based on current information, including our assessment of the merits of the particular claim, except as described above under "Antitrust Investigations", we do not expect the legal proceedings, claims or investigations currently pending against us will have any material adverse effect on our annual consolidated financial position, results of operations or liquidity.

Warranty Matters
We provide warranties on some of our products. The warranty terms vary but range from one year up to limited lifetime warranties on some of our premium aftermarket products. Provisions for estimated expenses related to product warranty are made at the time products are sold or when specific warranty issues are identified with our products. These estimates are established using historical information about the nature, frequency, and average cost of warranty claims. We believe that the warranty reserve is appropriate; however, actual claims incurred could differ from the original estimates, requiring adjustments to the reserve. The reserve is included in both accrued expenses and other current liabilities, and deferred credits and other liabilities in the consolidated balance sheets.

INFORMATION ABOUT OUR EXECUTIVE OFFICERS

The following provides information concerning the persons who serve as our executive officers as of March 2, 2020.

Name and Age	Offices Held
Brian J. Kesseler (53)	Chief Executive Officer
Jason M. Hollar (46)	Executive Vice President Finance and Chief Financial Officer
Peng (Patrick) Guo (54)	Executive Vice President and President Clean Air
Rainer Jueckstock (60)	Executive Vice President and President Powertrain
Bradley S. Norton (56)	Executive Vice President and President Original Equipment
Scott Usitalo (61)	Executive Vice President and President Motorparts
Kaled Awada (45)	Senior Vice President and Chief Human Resources Officer
Brandon B. Smith (39)	Senior Vice President, General Counsel and Corporate Secretary
John S. Patouhas (53)	Vice President and Chief Accounting Officer

Brian J. Kesseler — Mr. Kesseler became Chief Executive Officer in January 2020. He served as Co-Chief Executive Officer from October 2018 to January 2020. He was previously Chief Executive Officer from May 2017 to September 2018. He served as Chief Operating Officer from January 2015 to May 2017. Prior to joining Tenneco, he spent more than 20 years working for Johnson Controls Inc., most recently serving as President of the Johnson Controls Power Solutions business. In 2013, he was elected a corporate officer, and was a member of the Johnson Controls executive operating team. Mr. Kesseler also served as the sponsor of Johnson Controls' Manufacturing Operations Council. Mr. Kesseler joined JCI in 1994 and during his tenure held leadership positions in all of the company's business units, including serving as Vice President and General Manager, Service-North America, Systems and Services Europe, and Unitary Products Group, for the Building Efficiency business. He began his career with the Ford Motor Company in 1989 and worked in North America Assembly Operations for five years, specializing in manufacturing management. Mr. Kesseler became a director of our company in October 2016.

Jason M. Hollar — Mr. Hollar became Executive Vice President and Chief Financial Officer in July 2018. He joined Tenneco as Senior Vice President Finance and served from June 2017 to June 2018. Prior to joining Tenneco, Mr. Hollar was Chief Financial Officer of Sears Holdings Corporation beginning in October 2016 and has served as Senior Vice President, Finance of Sears since October 2014. Previously, he was with Delphi Automotive PLC, serving from December 2013 to September 2014 as Vice President and Corporate Controller and from April 2011 to November 2013 as CFO, Powertrain Systems and Delphi Europe, Middle East and Africa.

Peng (Patrick) Guo — Mr. Guo was named Executive Vice President and President Clean Air in March 2017. Previously, Mr. Guo was Executive Vice President, Asia Pacific since December 2016, and was Senior Vice President and General Manager, Asia Pacific from October 2014 until December 2016. Mr. Guo served as Vice President and Managing Director, China from 2007 until October 2014. From 1996 to 2003, Mr. Guo served as General Manager, Asia Aftermarket Operations while based in Beijing, China. He left Tenneco in October 2003 to become president of the AGC Automotive China Operations for the Asahi Glass Company. He returned to Tenneco in July 2007. Before joining Tenneco, Mr. Guo was an engineer at the Ford Motor Company, which included assignments in manufacturing, quality and product design.

Rainer Jueckstock — Mr. Jueckstock joined Tenneco as Executive Vice President and President Powertrain in October 2018. Prior to joining Tenneco, Mr. Jueckstock was Co-Chairman of the Board and Co-Chief Executive Officer of Federal-Mogul LLC from 2014 to 2018, and Chief Executive Officer, Federal-Mogul Powertrain from 2012 to 2018. Prior to his Co-Chairman and Co-Chief Executive Officer positions, Mr. Jueckstock was Senior Vice President, Powertrain Energy from 2005 to 2012, a member of the Strategy Board from 2005 to 2012 and an officer of Federal-Mogul Corporation from 2005 to 2012. He is a director of Plexus Corp.

Bradley S. Norton — Mr. Norton joined Tenneco as Executive Vice President in October 2018. Prior to joining Tenneco, Mr. Norton was Co-Chairman of the Board and Co-Chief Executive Officer of Federal-Mogul Holdings LLC from March 2017 to September 2018, and Chief Executive Officer, Federal-Mogul Motorparts from July 2014 to March 2017. He was also elected to the Board of Managers of Federal-Mogul LLC in March 2017. Prior to that appointment, Mr. Norton was Senior Vice President, Chassis & Service, Federal-Mogul Motorparts beginning in July 2014.

Scott Usitalo - Mr. Usitalo joined Tenneco as Senior Vice President and Chief Marketing Officer in November 2018. Prior to joining Tenneco, Mr. Usitalo was a marketing executive of Kimberly-Clark Company from 2007 to November 2018, most recently serving as Chief Marketing Officer. Prior to his role at Kimberly-Clark Company, Mr. Usitalo spent over 20 years with Procter & Gamble Company.

Kaled Awada — Mr. Awada joined Tenneco as Senior Vice President and Chief Human Resources Officer in September 2018. Prior to joining Tenneco, Mr. Awada held Human Resources leadership positions of increasing responsibility at Aptiv PLC for three years, most recently Global Vice President, Human Resources, for the company's electrical distribution systems business. He previously held global Human Resources roles with Eaton Corporation, Textron Fastening Systems, and Faurecia Exhaust Systems.

Brandon B. Smith — Mr. Smith has served as our Senior Vice President, General Counsel and Corporate Secretary since February 2018 and is responsible for managing our worldwide legal affairs including corporate governance and compliance. Previously, he served as our Vice President, Deputy General Counsel and Assistant Secretary since November 2014 and Interim General Counsel since October 2017. Mr. Smith also served as our Assistant General Counsel from April 2011 to November 2014 and as our Senior Corporate Counsel from November 2010 until April 2011. Mr. Smith joined Tenneco in July 2008 as Corporate Counsel. Prior to joining Tenneco, Mr. Smith was a corporate attorney with Kirkland & Ellis LLP, representing both public and private enterprises on a wide variety of corporate engagements.

John S. Patouhas — Mr. Patouhas has served as our Vice President and Chief Accounting Officer since February 2019. Mr. Patouhas served since 2015 as Vice President and Chief Accounting Officer of Federal-Mogul (a subsidiary of Tenneco since October 2018). From 2011 to 2015, Mr. Patouhas was Vice President and Corporate Controller at Altair Engineering, a product design and development, engineering software and cloud computing software provider. He has over 20 years' experience in financial reporting and corporate accounting at a variety of companies, and began his career as an auditor with Deloitte. Mr. Patouhas is a CPA and CGMA, and has an MBA from Wayne State University.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS, AND ISSUER PURCHASES OF EQUITY SECURITIES.

Our outstanding shares of Class A Common Stock, par value $0.01 per share, are listed on the New York Stock Exchange under the symbol "TEN." The Company suspended the quarterly dividend in the second quarter of 2019. Our dividend program and the payment of any future cash dividends are subject to continued capital availability, the judgment of our Board of Directors and our continued compliance with the provisions pertaining to the payment of dividends under our debt agreements.

For additional information concerning our payment of dividends, see "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in Item 7.

As of February 27, 2020, there were approximately 9,800 holders of record of our Class A Common Stock, including brokers and other nominees, and two holders of record of our Class B Common Stock.

Purchase of equity securities by the issuer and affiliated purchasers
The following table provides information relating to our purchase of shares of our class A common stock in the fourth quarter of 2019. These purchases include shares withheld upon vesting of restricted stock for minimum tax withholding obligations. We generally intend to continue to satisfy statutory minimum tax withholding obligations in connection with the vesting of outstanding restricted stock through the withholding of shares.

Period	Total Number of Shares Purchased [1]	Average Price Paid	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Value of Shares That May Yet be Purchased Under These Plans or Programs
October 2019	21	$ 12.98	—	$ 231,000,000
November 2019	—	—	—	231,000,000
December 2019	—	—	—	$ 231,000,000
Total	21	$ 12.98	—	

[1] Shares withheld upon vesting of restricted stock in the fourth quarter of 2019.

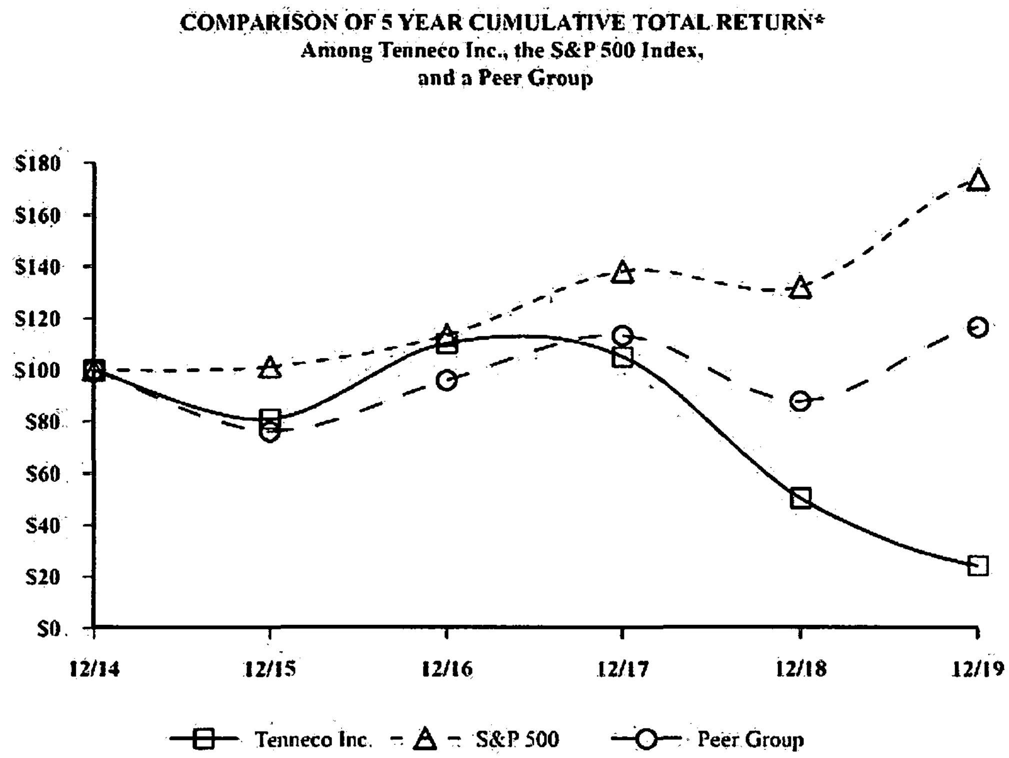
During 2015, our Board of Directors approved a share repurchase program, authorizing us to repurchase up to $550 million of our then outstanding class A common stock over a three-year period ("2015 Program"). In February 2017, our Board of Directors authorized the repurchase of up to $400 million of our then outstanding class A common stock over the next three years ("2017 Program"), this included $112 million that remained authorized under the 2015 Program. We generally acquire the shares through open market or privately negotiated transactions, and have historically utilized cash from operations. The repurchase program does not obligate us to repurchase shares within any specific time or situations.

No new share repurchase programs were authorized by our Board of Directors in 2018 or 2019 and we did not repurchase any shares under the 2017 Program in 2018 or 2019. Since we announced the repurchase program in January 2015, we have repurchased 11.3 million shares for $607 million through December 31, 2019. The remaining $231 million authorized for share repurchases under the 2017 Program expired at December 31, 2019.

Recent Sales of Unregistered Securities
None.

Share Performance

The following graph shows a five-year comparison of the cumulative total stockholder return on Tenneco's common stock as compared to the cumulative total return of two other indexes: a custom composite index ("Peer Group") and the Standard & Poor's 500 Composite Stock Price Index. The companies included in the Peer Group are: American Axle & Manufacturing Co., BorgWarner Inc., Cummins Inc., Johnson Controls International Plc, Lear Corp., Magna International Inc., and Meritor, Inc. These comparisons assume an initial investment of $100 and the reinvestment of dividends.



*$100 invested on 12/31/14 in stock or index, including reinvestment of dividends.
Fiscal year ending December 31.

	As of December 31					
	2014	2015	2016	2017	2018	2019
Tenneco Inc.	$ 100.00	$ 81.10	$ 110.35	$ 105.18	$ 50.37	$ 24.26
S&P 500	$ 100.00	$ 101.38	$ 113.51	$ 138.29	$ 132.33	$ 173.86
Peer Group	$ 100.00	$ 76.39	$ 96.09	$ 113.51	$ 87.90	$ 116.73

The graph and other information furnished in the section titled "Share Performance" under this Part II, Item 5 of this Form 10-K shall not be deemed to be "soliciting" material or to be "filed" with the Securities and Exchange Commission or subject to Regulation 14A or 14C, or to the liabilities of Section 18 of the Securities Exchange Act of 1934, as amended.

ITEM 6. SELECTED FINANCIAL DATA.

The following data should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Operations" in Item 7 and our consolidated financial statements "Financial Statements and Supplementary Data" in Item 8. These items include discussions of factors affecting comparability of the information shown below, including the completion of the acquisition of Federal-Mogul on October 1, 2018 as discussed Note 3, Acquisitions and Divestitures in Item 8.

	Year Ended December 31				
	2019	2018	2017	2016	2015
	(Millions Except Share and Per Share Amounts)				
Statements of Income Data:					
Net sales and operating revenues	$ 17,450	$ 11,763	$ 9,274	$ 8,597	$ 8,180
Earnings before interest expense, income taxes, and noncontrolling interests[a]	$ 121	$ 322	$ 413	$ 484	$ 507
Net income (loss)	$ (220)	$ 111	$ 265	$ 415	$ 291
Net income (loss) attributable to Tenneco Inc.	$ (334)	$ 55	$ 198	$ 347	$ 237
Basic earnings (loss) per share	$ (4.12)	$ 0.93	$ 3.75	$ 6.20	$ 3.98
Diluted earnings (loss) per share	$ (4.12)	$ 0.93	$ 3.73	$ 6.15	$ 3.94
Cash dividends declared per share	$ 0.25	$ 1.00	$ 1.00	$ —	$ —
Balance Sheet Data:					
Total assets	$ 13,226	$ 13,232	$ 4,796	$ 4,312	$ 3,937
Short-term debt	$ 185	$ 153	$ 103	$ 117	$ 103
Long-term debt	$ 5,371	$ 5,340	$ 1,358	$ 1,294	$ 1,124
Redeemable noncontrolling interests	$ 196	$ 138	$ 42	$ 40	$ 41
Total equity	$ 1,619	$ 1,916	$ 682	$ 573	$ 425

[a]Includes restructuring charges and asset impairments, net for each year as follows:

	Year Ended December 31				
	2019	2018	2017	2016	2015
	(Millions)				
Restructuring charges and asset impairments, net	$ 126	$ 117	$ 47	$ 30	$ 63

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

You should read the following discussion and analysis in conjunction with the consolidated financial statements and related notes included in "Financial Statements and Supplementary Data" in Item 8. All references to "Tenneco," "we," "us," "our" and "the Company" refer to Tenneco Inc. and its consolidated subsidiaries. Notes referenced in this discussion and analysis refer to the notes to consolidated financial statements that are found in "Financial Statements and Supplementary Data" in Item 8.

Certain amounts in the prior years have been aggregated or disaggregated to conform to current year presentation as discussed in Note 2, Summary of Significant Accounting Policies in Item 8. Accordingly, this Management's Discussion and Analysis of Financial Condition and Results of Operations reflect the effects of these reclassifications.

OVERVIEW

Our Company

We are one of the world's leading manufacturers of clean air, powertrain and ride performance products and systems for light vehicle, commercial truck, off-highway, industrial, and aftermarket customers. Both original equipment ("OE") vehicle designers and manufacturers, and the repair and replacement markets, or aftermarket, are served globally through leading brands, including Monroe®, Champion®, Öhlins®, MOOG®, Walker®, Fel-Pro®, Wagner®, Ferodo®, Rancho®, Thrush®, National®, and Sealed Power®, among others. As of December 31, 2019, we operated 201 manufacturing facilities worldwide and employed approximately 78,000 people to service our customers' demands.

Factors that continue to be critical to our success include winning new business awards, managing our overall global manufacturing footprint to ensure proper placement and workforce levels in line with business needs, maintaining competitive wages and benefits, maximizing efficiencies in manufacturing processes, and reducing overall costs. In addition, our ability to adapt to key industry trends, such as a shift in consumer preferences to other vehicles in response to higher fuel costs and other economic and social factors, increasing technologically sophisticated content, changing aftermarket distribution channels, increasing environmental standards and extended product life of automotive parts, also play a critical role in our success. Other factors that are critical to our success include adjusting to economic challenges such as increases in the cost of raw materials and our ability to successfully reduce the effect of any such cost increases through material substitutions, cost reduction initiatives, and other methods.

Öhlins Intressenter AB Acquisition

On January 10, 2019, we completed the acquisition of a 90.5% ownership interest in Öhlins Intressenter AB (the "Öhlins Acquisition"), a Swedish technology company that develops premium suspension systems and components for the automotive and motorsport industries. The purchase price was $162 million. See Note 3, Acquisitions and Divestitures, in our consolidated financial statements included in Item 8 for additional information.

Federal-Mogul Acquisition

On October 1, 2018, we completed the acquisition of a 100% ownership interest in Federal-Mogul LLC (the "Federal-Mogul Acquisition", and together with the Öhlins Acquisition, the "Acquisitions"). Total consideration was approximately $3.7 billion. See Note 3, Acquisitions and Divestitures, in our consolidated financial statements included in Item 8 for additional information.

Separation Transaction and Change in Reportable Segments

Following the closing of the Federal-Mogul Acquisition, we agreed to use our reasonable best efforts to pursue the separation of the combined company. As such, we previously announced our intention to separate our businesses through a spin-off transaction to form two new, independent, publicly traded companies, a new Powertrain Technology company ("New Tenneco") and an Aftermarket and Ride Performance company ("DRiV"). Current end-market conditions are affecting our ability to complete a separation within our previously announced timeline and we expect these trends will continue throughout this year. During 2020, we will be focused on the execution of our accelerated performance improvement plan ("Accelerate") to facilitate the expected separation of New Tenneco and DRiV. The Accelerate program is focused on achieving additional cost savings, improving capital efficiency, and reducing leverage. We have made significant progress to facilitate the planned separation of the DRiV business and have completed all necessary system and process components required for New Tenneco and DRiV to operate independently. In this respect, we are ready to separate the businesses as soon as favorable conditions are present. In order to facilitate the separation, we continue to evaluate multiple strategic alternatives, as well as options to deleverage and mitigate the ongoing effect of challenging market conditions.

The future New Tenneco consists of two existing operating segments, Clean Air and Powertrain:

- The Clean Air segment designs, manufactures, and distributes a variety of products and systems designed to reduce pollution and optimize engine performance, acoustic tuning, and weight on a vehicle for OEMs; and
- The Powertrain segment focuses on original equipment powertrain products for automotive, heavy duty, and industrial applications.

In preparation for the separation, in the first quarter of 2019, we began to manage and report our DRiV businesses through two new operating segments as compared to the three operating segments we had previously reported. The DRiV operating segments are Motorparts and Ride Performance. The new Motorparts operating segment consists of the previously reported Aftermarket operating segment as well as the aftermarket portion of the previously reported Motorparts operating segment. The Ride Performance operating segment consists of the previously reported Ride Performance operating segment as well as the OE Braking business that was included in the previously reported Motorparts operating segment:

- The Motorparts segment engineers, manufactures, sources, and distributes a broad portfolio of products in the global vehicle aftermarket while also servicing the original equipment and original equipment servicers market with products, including vehicle braking systems and a wide variety of chassis, engine, sealing, wiper, filter, lighting, and other general maintenance applications; and
- The Ride Performance segment designs, manufactures, markets, and distributes a variety of ride performance solutions and systems to a global OE customer base, including noise, vibration, and harshness performance materials, advanced suspension technologies, ride control, and braking.

Costs related to other business activities, primarily corporate headquarter functions, are disclosed separately from the four operating segments as "Corporate." Prior period operating segment results have been conformed to reflect the Company's current operating segments.

See Note 21, Segment and Geographic Area Information, in our consolidated financial statements included in Item 8 for additional information.

Financial Results for the Year Ended December 31, 2019

Consolidated revenues were $17,450 million, an increase of $5,687 million, or 48%, for the year ended December 31, 2019. The Acquisitions increased revenues by $5,600 million, or 48%. The remaining increase in revenues was primarily driven by the net favorable effects of organic growth from higher sales volume and mix of $370 million and $27 million in net favorable effects of other, this was partially offset by the unfavorable effects of foreign currency exchange of $310 million.

Cost of sales was $14,912 million, an increase of $4,910 million, or 49%, for the year ended December 31, 2019. The Acquisitions increased cost of sales by $4,705 million, or 47%. The remaining increase in cost of sales was primarily driven by incremental costs related to higher sales volume and mix of $429 million, the unfavorable effects of material sourcing of $11 million, and an increase in other costs of $1 million, this was partially offset by the favorable effects of foreign currency exchange of $236 million.

Net income decreased by $331 million to a net loss of $220 million for the year ended December 31, 2019 compared to net income of $111 million for the year ended December 31, 2018. The decrease was primarily driven by:

- an increase in selling, general, and administrative ("SG&A") costs, primarily due to the effect of the Acquisitions of $410 million, which was partially offset by a net reduction in SG&A costs of $24 million;
- an increase in depreciation and amortization of $328 million primarily due to the Acquisitions;
- an increase in engineering, research, and development of $124 million primarily due to the Acquisitions;
- an increase in restructuring charges and asset impairments of $9 million;
- a goodwill impairment charge of $108 million and impairment of indefinite-lived intangible assets of $133 million; and
- an increase in interest expense and other financing charges of $174 million.

These unfavorable effects were partially offset by:

- an increase in equity earnings in nonconsolidated affiliates of $25 million, which was the result of the Federal-Mogul Acquisition;
- an increase in other income (expense), net of $63 million due primarily to the Acquisitions, a recovery of value-added tax in a foreign jurisdiction, and income from an EPA mandate to which we were the beneficiary; and
- a reduction in income tax expense of $44 million.

Recent Trends and Market Conditions

There is inherent uncertainty in the continuation of the trends discussed below. In addition, there may be other factors or trends that can have an effect on our business. Our business and operating results are affected by the relative strength of:

General economic conditions
Our OE business is directly related to automotive vehicle production by our customers. Automotive production levels depend on a number of factors, including global and regional economic conditions and policies. Demand for aftermarket products is driven by three primary factors: the number of vehicles in operation; the average age of vehicles; and vehicle usage trends (primarily distance traveled).

In December 2019, a strain of coronavirus surfaced in Wuhan, China, which has resulted in plant closures in China, supply chain disruptions, restrictions on travel to China, and a decrease in consumer traffic in China. The coronavirus has spread to multiple countries around the world and we are carefully monitoring the potential impact of the coronavirus in these other countries. The impact to the supply chain as a result of the coronavirus outbreak could further impact production at our and our customers' sites in China, as well as affect production at our and our customers' sites outside of China. We presently believe the impact of lost production in the first quarter of 2020 as a result of the coronavirus will be $150 million on value-add revenue and $50 million on EBITDA. However, the coronavirus outbreak continues to spread as of the date of this report and, accordingly, we cannot predict the extent to which the coronavirus will ultimately affect our business, results of operations or financial condition.

Global vehicle production levels

Light vehicle production (According to IHS Markit, January 2020)
For the year ended 2019, global light vehicle production was down across all major markets in which we operate and down 6% overall compared to 2018. North America, South America, and Europe light vehicle production was down 4% in each of the three regions. Production was down 9% in China and 11% in India.

Global light vehicle production in 2020 is expected to decline by 1% overall compared to 2019. Current projections show a marginal 1% improvement in North America and 4% improvement in South America, which are expected to be more than offset by a 2% reduction in Europe, a 1% decrease in China, and a 4% decline in India.

Commercial truck production (According to IHS Markit, February 2020)
Global commercial truck production decreased by 6% for the full year ending December 31, 2019. European commercial truck production fell 6%, China was down 3%, and India had negative growth of 28%. Brazil remained flat in 2019 when compared with the same twelve month period ending December 31, 2018. There was a 2% increase in commercial truck production in our primary market of North America.

Global commercial truck production is expected to continue to decline during 2020, projecting a 9% overall decline compared to 2019. Current 2020 projections for the major markets in which we operate show North America down 17%, Brazil up 6%, Europe down 4%, China down 10%, and India down 14% over 2019.

RESULTS OF OPERATIONS

Year Ended December 31, 2019 Compared to Year Ended December 31, 2018

Consolidated Results of Operations

	Year Ended December 31		Increase / (Decrease)	
	2019	2018	$ Change	% Change [a]
	(Millions Except Percent, Share and Per Share Amounts)			
Revenues				
Net sales and operating revenues	$ 17,450	$ 11,763	$ 5,687	48 %
Costs and expenses				
Cost of sales (exclusive of depreciation and amortization)	14,912	10,002	4,910	49 %
Selling, general, and administrative	1,138	752	386	51 %
Depreciation and amortization	673	345	328	95 %
Engineering, research, and development	324	200	124	62 %
Restructuring charges and asset impairments	126	117	9	8 %
Goodwill and intangible impairment charges	241	3	238	n/m
	17,414	11,419	5,995	53 %
Other income (expense)				
Non-service pension and postretirement benefit (costs) credits	(11)	(20)	9	(45)%
Equity in earnings (losses) of nonconsolidated affiliates, net of tax	43	18	25	139 %
Loss on extinguishment of debt	—	(10)	10	(100)%
Other income (expense), net	53	(10)	63	n/m
	85	(22)	107	n/m
Earnings (loss) before interest expense, income taxes, and noncontrolling interests	121	322	(201)	(62)%
Interest expense	(322)	(148)	(174)	118 %
Earnings (loss) before income taxes and noncontrolling interests	(201)	174	(375)	(216)%
Income tax (expense) benefit	(19)	(63)	44	(70)%
Net income (loss)	(220)	111	(331)	n/m
Less: Net income attributable to noncontrolling interests	114	56	58	104 %
Net income (loss) attributable to Tenneco Inc.	$ (334)	$ 55	$ (389)	n/m
Earnings (loss) per share				
Basic earnings (loss) per share:				
Earnings (loss) per share	$ (4.12)	$ 0.93		
Weighted average shares outstanding	80,904,060	58,625,087		
Diluted earnings (loss) per share:				
Earnings (loss) per share	$ (4.12)	$ 0.93		
Weighted average shares outstanding	80,904,060	58,758,732		

[a] Percentages above denoted as "n/m" are not meaningful to present in the table.

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Revenues
Revenues increased by $5,687 million, or 48%, as compared to the year ended December 31, 2018. The Acquisitions increased revenues by $5,600 million, or 48%. The remaining increase in revenues was primarily driven by the net favorable effects of organic growth from higher sales volume and mix of $370 million and $27 million in net favorable effects of other, this was partially offset by the unfavorable effects of foreign currency exchange of $310 million.

The following table reflects our consolidated revenues for the years ended December 31, 2019 and 2018 ($ millions):

Year Ended December 31, 2018	$	11,763
Acquisitions		5,600
Drivers in the change of organic revenues:		
Volume and mix		370
Currency exchange rates		(310)
Others		27
Year Ended December 31, 2019	$	17,450

Cost of sales
Cost of sales increased by $4,910 million, or 49%, as compared to the year ended December 31, 2018. The Acquisitions increased cost of sales by $4,705 million, or 47%. Cost of sales as a percentage of sales remained consistent at 85%. The remaining increase in cost of sales was primarily driven by incremental costs related to higher sales volume and mix of $429 million, the unfavorable effects of material sourcing of $11 million, and an increase in other costs of $1 million, this was partially offset by the favorable effects of foreign currency exchange of $236 million.

The following table lists the primary drivers behind the change in cost of sales ($ millions):

Year Ended December 31, 2018	$	10,002
Acquisitions		4,705
Drivers in the change of organic cost of sales:		
Volume and mix		429
Material		11
Currency exchange rates		(236)
Others		1
Year Ended December 31, 2019	$	14,912

Selling, general, and administrative (SG&A)
SG&A increased by $386 million to $1,138 million compared to $752 million in the year ended December 31, 2018. The increase was primarily due to the effect of the Acquisitions of $410 million. For the year ended December 31, 2019, there was $127 million of acquisition and expected separation costs, $14 million of costs to achieve synergies, and $15 million of cost reduction initiatives, while the year ended December 31, 2018 included $96 million of acquisition and expected separation costs, $25 million of costs to achieve synergies, $18 million of cost reduction initiatives, and $10 million of litigation settlement.

Depreciation and amortization
Depreciation and amortization expense was $673 million for the year ended December 31, 2019 compared to $345 million for the year ended December 31, 2018. The increase of $328 million was due primarily to the Acquisitions which added $299 million of incremental depreciation and amortization expense in the year ended December 31, 2019. In addition, accelerated depreciation expense of $15 million was recognized in the year ended December 31, 2019 on assets associated with plant closures.

Engineering, research, and development
Engineering, research, and development expense was $324 million for the year ended December 31, 2019 compared to $200 million for the year ended December 31, 2018. The increase of $124 million was due primarily to the Acquisitions.

Restructuring charges and asset impairments
Restructuring charges and asset impairments were $126 million for the year ended December 31, 2019 compared to $117 million for the year ended December 31, 2018. Costs incurred in each period primarily relate to facility closures and consolidations, and headcount reduction initiatives. Also included in the year ended December 31, 2019 is an $8 million impairment charge incurred on assets held for sale. See Note 4, Restructuring Charges and Asset Impairments in our consolidated financial statements included in Item 8 for additional information.

Goodwill and intangible impairment charges
Goodwill and intangible impairment charges were $241 million for the year ended December 31, 2019. Goodwill impairment charges of $108 million were recorded for three of our reporting units. These charges included $69 million in the Ride Performance segment as a result of our reporting unit reorganization. In addition, as a result of our goodwill impairment assessment in the fourth quarter of 2019, there were two reporting units where their fair values were lower than their carrying values resulting in a $21 million impairment charge in the Motorparts segment and a $18 million impairment charge in the Powertrain segment. This compared to a $3 million goodwill impairment charge in the year ended December 31, 2018, which related to a reporting unit within the Ride Performance segment.

As a result of our indefinite-lived intangible asset impairment assessment in the fourth quarter of 2019, intangible asset impairment charges of $133 million were recorded for two reporting units in the Motorparts segment.

Non-service pension and postretirement benefit costs (credits)
Non-service pension and postretirement benefit costs decreased by $9 million to $11 million compared to $20 million for the year ended December 31, 2018. This is primarily attributable to a $7 million curtailment gain for the year ended December 31, 2019 as compared to a curtailment loss of $1 million for the year ended December 31, 2018 resulting from the plan amendments approved during 2019 to eliminate postretirement benefits for certain nonunion employees.

Equity in earnings (losses) of nonconsolidated affiliates, net of tax
Equity in earnings (losses) of nonconsolidated affiliates, net of tax increased $25 million to $43 million compared to $18 million in the year ended December 31, 2018. The increase was primarily due to the Federal-Mogul Acquisition.

Loss on extinguishment of debt
Loss on extinguishment of debt of $10 million in the year ended December 31, 2018 related to the repayment of our revolver and term loan A and the new refinancing in connection with the Federal-Mogul Acquisition.

Other income (expense), net
Other income (expense), net increased by $63 million as compared to the year ended December 31, 2018. The Acquisitions increased other income (expense), net by $20 million. The remaining increase was primarily attributable to a recovery of value-added tax in a foreign jurisdiction and income from an EPA mandate to which we were the beneficiary.

Interest expense
Interest expense was $322 million (substantially all in our U.S. operations), net of interest capitalized of $5 million, for the year ended December 31, 2019 compared to $148 million (substantially all in our U.S. operations), net of interest capitalized of $5 million, for the year ended December 31, 2018. The $174 million increase was primarily due to higher interest expense pertaining to the five-year $1.7 billion term loan A facility and the seven-year $1.7 billion term loan B facility that we entered into in connection with the Federal-Mogul Acquisition and the interest expense on Federal-Mogul debt obligations assumed.

Interest expense included losses on sales of accounts receivables, which was $31 million in the year ended December 31, 2019 compared to $16 million in the year ended December 31, 2018. The increase was primarily attributable to the Federal-Mogul Acquisition. For more detailed explanations on our debt structure and senior credit facility refer to "Liquidity and Capital Resources - Capitalization" later in this Management's Discussion and Analysis.

Income tax expense (benefit)
Income tax expense was $19 million on loss before income taxes and noncontrolling interests of $201 million for the year ended December 31, 2019 compared to income tax expense of $63 million on earnings before income taxes and noncontrolling interests of $174 million for the year ended December 31, 2018. The tax expense recorded for the year ended December 31, 2019 included tax benefits of $33 million relating to a valuation allowance release for an entity in Spain. In addition, the Company recorded $22 million of tax expense relating to the goodwill impairment charges and $21 million of tax expense relating to gains on transfers of subsidiaries for entities in China and Luxembourg for the year ended December 31, 2019.

The tax expense recorded for the year ended December 31, 2018 included tax benefits of $10 million relating to a valuation allowance release for entities in Australia and $11 million of tax expense for changes in the toll tax. On December 22, 2017, the Tax Cuts and Jobs Act ("TCJA") was enacted into U.S. law, which, among other provisions, lowered the corporate income tax rate effective January 1, 2018 from 35% to 21%, and implemented significant changes with respect to U.S. tax treatment of earnings originating from outside the U.S. Based on the new guidance, an $11 million discrete charge was recorded in income tax expense for the year ended December 31, 2018.

Net income (loss)
We had a net loss of $220 million for the year ended December 31, 2019 compared to net income of $111 million for the year ended December 31, 2018, a decrease of $331 million, as result of the aforementioned items.

Earnings before interest expense, income taxes, noncontrolling interests, and depreciation and amortization ("EBITDA including noncontrolling interests")
The following table presents the reconciliation from EBITDA including noncontrolling interests to net income (loss) for the years ended December 31, 2019 and 2018 ($ in millions):

	Year Ended December 31	
	2019	**2018**
EBITDA including noncontrolling interests by Segment:		
Clean Air	$ 582	$ 599
Powertrain	363	93
Ride Performance	8	69
Motorparts	184	161
Corporate	(343)	(255)
Depreciation and amortization	(673)	(345)
Earnings before interest expense, income taxes, and noncontrolling interests	121	322
Interest expense	(322)	(148)
Income tax (expense) benefit	(19)	(63)
Net income (loss)	$ (220)	$ 111

See "Segment Results of Operations" for further information on EBITDA including noncontrolling interests.

Segment Results of Operations

Overview of Net Sales and Operating Revenues
Our Clean Air segment has substrate sales. Substrates are porous ceramic filters coated with a catalyst - typically, precious metals such as platinum, palladium and rhodium. We do not manufacture substrates, they are supplied to us by Tier 2 suppliers generally directed by our OE customers. We generally earn a small margin on these components of the system. These substrate components have been increasing as a percentage of our revenue as the need for more sophisticated emission control solutions increases to meet more stringent environmental regulations, and as we capture more diesel aftertreatment business. While these substrates dilute our gross margin percentage, they are a necessary component of an emission control system.

Our value-add content in an emission control system includes designing the system to meet environmental regulations through integration of the substrates into the system, maximizing use of thermal energy to heat up the catalyst quickly, efficiently managing airflow to reduce back pressure as the exhaust stream moves past the catalyst, managing the expansion and contraction of the emission control system components due to temperature extremes experienced by an emission control system, using advanced acoustic engineering tools to design the desired exhaust sound, minimizing the opportunity for the fragile components of the substrate to be damaged when we integrate it into the emission control system and reducing unwanted noise, vibration, and harshness transmitted through the emission control system.

We disclose substrate sales amounts because we believe investors utilize this information to understand the effect of this portion of our revenues on our overall business and because it removes the effect of potentially volatile precious metals pricing from our revenues. While our OE customers generally assume the risk of precious metals pricing volatility, it affects our reported revenues.

The table below reflects our segment revenues for the years ended December 31, 2019 and 2018 ($ in millions):

	Segment Revenue									
	New Tenneco				DRiV					
	Clean Air		Powertrain		Ride Performance		Motorparts		Total Revenue	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Revenues	$ 7,121	$ 6,707	$ 4,408	$ 1,112	$ 2,754	$ 2,164	$ 3,167	$ 1,780	$ 17,450	$ 11,763
Value-add revenues	4,094	4,207	4,408	1,112	2,754	2,164	3,167	1,780	14,423	9,263
Currency effect on value-add revenue	113	—	12	—	75	—	42		242	
Value-add revenue excluding currency	$ 4,207	$ 4,207	$ 4,420	$ 1,112	$ 2,829	$ 2,164	$ 3,209	$ 1,780	$ 14,665	$ 9,263
Substrate sales	$ 3,027	$ 2,500	$ —	$ —	$ —	$ —	$ —	$ —	$ 3,027	$ 2,500
Effect of Acquisitions	$ —	$ —	$ 3,390	$ 1,112	$ 686	$ 215	$ 1,524	$ 559	$ 5,600	$ 1,886

Light Vehicle Industry Production by Region for Years Ended December 31, 2019 and 2018 (According to IHS Markit, January 2020)

	Year Ended December 31			
	2019	2018	Increase (Decrease)	% Increase (Decrease)
	(Number of Vehicles in Thousands)			
North America	16,290	16,959	(669)	(4)%
Europe	21,058	21,979	(921)	(4)%
South America	3,278	3,430	(152)	(4)%
China	24,341	26,606	(2,265)	(9)%
India	4,200	4,720	(520)	(11)%

Segment Revenue
Clean Air
Clean Air revenue increased $414 million to $7,121 million compared to $6,707 million for the year ended December 31, 2018. Higher light vehicle and commercial truck revenues, offset partially by lower off highway and other vehicle revenues, resulted in a favorable $606 million effect on revenue in the year ended December 31, 2019. Foreign currency exchange had an unfavorable effect of $181 million on Clean Air revenues, leaving a net unfavorable $11 million of other.

Powertrain
Powertrain full year revenue was $4,408 million for the year ended December 31, 2019 compared to $1,112 million of revenue for the year ended December 31, 2018. The difference of $3,296 million was primarily attributable to a full year of operations for the Powertrain segment as a result of the Federal-Mogul Acquisition.

Ride Performance
Ride Performance revenue increased $590 million to $2,754 million compared to $2,164 million for the year ended December 31, 2018. The Acquisitions increased revenue by $686 million. The remaining decrease of $96 million was due to lower volume and unfavorable mix, particularly in North America of $27 million, and the unfavorable effects of foreign currency exchange of $75 million.

Motorparts
Motorparts revenue increased $1,387 million to $3,167 million compared to $1,780 million for the year ended December 31, 2018. The Federal-Mogul Acquisition increased revenue by $1,524 million. The remaining decrease of $137 million was due to lower volumes and unfavorable mix of $132 million and unfavorable foreign currency exchange of $42 million, which was partially offset by favorable other of $37 million.

EBITDA including noncontrolling interests
The following table presents the EBITDA including noncontrolling interests by segment for the years ended December 31, 2019 and 2018 ($ in millions):

	Year Ended December 31		
	2019	**2018**	**2019 vs 2018 Change**
EBITDA including noncontrolling interests by Segment:			
Clean Air	$ 582	$ 599	$ (17)
Powertrain	$ 363	$ 93	$ 270
Ride Performance	$ 8	$ 69	$ (61)
Motorparts	$ 184	$ 161	$ 23

Clean Air
Clean air EBITDA including noncontrolling interest decreased $17 million as compared to the year ended December 31, 2018. The decrease is primarily attributable to lower volume and unfavorable mix and unfavorable performance, partially offset by lower selling, general, and administrative costs and improved operating efficiencies.

Powertrain
As a result of the Federal-Mogul Acquisition, full year Powertrain EBITDA including noncontrolling interests was $363 million for the year ended December 31, 2019. Included in year ended December 31, 2019 was an $18 million goodwill impairment charge recorded as a result of the annual goodwill impairment analysis performed in the fourth quarter of 2019.

Ride Performance
Ride Performance EBITDA including noncontrolling interests decreased $61 million as compared to the year ended December 31, 2018. While the Acquisitions contributed $15 million of additional EBITDA including noncontrolling interests, this increase is more than offset by a goodwill impairment charge of $69 million taken in the year ended December 31, 2019 as a result of our operating segment reorganization. Also contributing to the decrease in EBITDA including noncontrolling interests was net unfavorable volume and mix, less favorable operating performance, and the unfavorable effects of foreign currency. These were partially offset by lower selling, general and administrative costs. The amounts discussed above include an immaterial $5 million charge related to a prior period recorded in the year ended December 31, 2019.

Motorparts
Motorparts EBITDA including noncontrolling interests increased $23 million as compared to the year ended December 31, 2018. The Federal-Mogul Acquisition contributed $214 million of EBITDA including noncontrolling interests to Motorparts in

the year ended December 31, 2019. This was partially offset by a $21 million goodwill impairment charge and an indefinite-lived intangible asset impairment charges of $133 million for the year ended December 31, 2019. The remaining decrease included the net unfavorable effects of volume and mix, the unfavorable effects of foreign currency exchange, less favorable operating performance, incremental costs associated with a warranty charge, and costs associated with process harmonization.

The EBITDA including noncontrolling interests results shown in the preceding table include the following items, certain of which may have an effect on the comparability of EBITDA including noncontrolling interests results between periods.

	Reportable Segments							
	Clean Air	Powertrain	Ride Performance	Motorparts	Total	Corporate	Reclass & Elims	Total
Year Ended December 31, 2019								
Costs to achieve synergies (1):								
Restructuring related to synergy initiatives	$ 6	$ 1	$ 2	$ 11	$ 20	$ 2	$ —	$ 22
Other cost to achieve synergies	—	1	—	—	1	6	—	7
Total costs to achieve synergies	6	2	2	11	21	8	—	29
Restructuring and related expenses:								
Other restructuring charges and costs(2)	23	30	68	3	124	9	—	133
Asset impairments	1	—	3	1	5	—	—	5
Impairment of assets held for sale	—	—	—	8	8	—	—	8
Total restructuring and related expenses	24	30	71	12	137	9	—	146
Cost reduction initiatives (3)						15		15
Acquisition and expected separation costs(4)	—	—	—	1	1	126	—	127
Purchase accounting adjustments(5)	—	12	4	41	57	—	—	57
Brazil tax credit(6)	(9)	—	(6)	(7)	(22)	—	—	(22)
Antitrust reserve change in estimate(7)	(9)	—	—	—	(9)	—	—	(9)
Out of period adjustment(8)	—	—	5	—	5	—	—	5
Process harmonization(9)	13	—	4	9	26	—	—	26
Warranty charge(10)	—	—	—	8	8	—	—	8
Pension settlement(11)	—	—	—	—	—	(2)	—	(2)
Goodwill and intangibles impairment charge(12)	—	18	69	154	241	—	—	241
Total adjustments	$ 25	$ 62	$ 149	$ 229	$ 465	$ 156	$ —	$ 621
Year Ended December 31, 2018								
Costs to achieve synergies (1):								
Restructuring related to synergy initiatives	$ 3	$ —	$ 10	$ 35	$ 48	$ 7	$ —	$ 55
Other cost to achieve synergies	—	—	1	1	2	5	—	7
Total costs to achieve synergies	3	—	11	36	50	12	—	62
Restructuring and related expenses:								
Other restructuring charges	11	(2)	43	7	59	(2)	—	57
Asset impairments	—	—	3	—	3	2	—	5
Total restructuring and related expenses	11	(2)	46	7	62	—	—	62
Cost reduction initiatives (3)	—	—	10	—	10	8	—	18
Warranty charge (10)	—	—	5	—	5	—	—	5
Litigation settlement accrual	—	—	9	—	9	1	—	10
Acquisition and expected separation costs(4)	—	—	—	—	—	96	—	96
Loss on extinguishment of debt (13)	—	—	—	—	—	10	—	10
Environmental charge (14)	—	—	—	—	—	4	—	4
Anti-dumping duty charge (15)	—	—	—	16	16	—	—	16
Pension charges (11)	—	—	3	—	3	—	—	3
Purchase accounting adjustments (5)	—	44	5	57	106	—	—	106
Goodwill impairment charge (16)	—	—	3	—	3	—	—	3
Total adjustments	$ 14	$ 42	$ 92	$ 116	$ 264	$ 131	$ —	$ 395

[1] Costs to achieve synergies related to the Acquisitions.
[2] The Ride Performance segment includes $42 million of other charges for the year ended December 31, 2019.
[3] Costs related to cost reduction initiatives.
[4] Costs related to the Acquisitions and expected separation.
[5] This primarily relates to a non-cash charge to cost of goods sold for the amortization of the inventory fair value step-up recorded as part of the Acquisitions.
[6] Recovery of value-added tax in a foreign jurisdiction.
[7] Reduction in estimated antitrust accrual.
[8] Inventory losses attributable to prior periods.
[9] Charge due to process harmonization.
[10] Charge related to warranty. Although we regularly incur warranty costs, this specific charge was of an unusual nature in the period incurred.
[11] Charges related to curtailments and settlements of our pension and other postretirement benefit plans in connection with our derisking activities.
[12] Includes non-cash goodwill impairment charge of $108 million and non-cash indefinite lived intangible asset impairment charge of $133 million for the year ended December 31, 2019. See Note 7, Goodwill and Other Intangible Assets, in our consolidated financial statements included in Item 8 for additional information.
[13] Loss on extinguishment of debt as a result of the refinancing of the revolving credit loan and tranche A term loan as a result of the Federal-Mogul Acquisition. See Note 11, Debt and Other Financing Arrangements, in our consolidated financial statements included in Item 8 for additional information.
[14] Environmental charge related to a site whereby an indemnification reverted back to the Company resulting from a 2009 bankruptcy filing of Mark IV Industries.
[15] Charges due to retroactive application of anti-dumping duty on a supplier's products.
[16] Non-cash asset impairment charge related to goodwill.

Year Ended December 31, 2018 Compared to Year Ended December 31, 2017

Consolidated Results of Operations

	Year Ended December 31		Increase / (Decrease)	
	2018	2017	$ Change	% Change [(a)]
	(Millions Except Percent, Share and Per Share Amounts)			
Revenues				
Net sales and operating revenues	$ 11,763	$ 9,274	$ 2,489	27 %
Costs and expenses				
Cost of sales (exclusive of depreciation and amortization)	10,002	7,771	2,231	29 %
Selling, general, and administrative	752	632	120	19 %
Depreciation and amortization	345	226	119	53 %
Engineering, research, and development	200	158	42	27 %
Restructuring charges and asset impairments	117	47	70	149 %
Goodwill and intangible impairment charges	3	11	(8)	(73)%
	11,419	8,845	2,574	29 %
Other income (expense)				
Non-service pension and postretirement benefit (costs) credits	(20)	(16)	(4)	25 %
Equity in earnings (losses) of nonconsolidated affiliates, net of tax	18	(1)	19	n/m
Loss on extinguishment of debt	(10)	(1)	(9)	n/m
Other expense (income), net	(10)	2	(12)	n/m
	(22)	(16)	(6)	38 %
Earnings (loss) before interest expense, income taxes, and noncontrolling interests	322	413	(91)	(22)%
Interest expense	(148)	(77)	(71)	92 %
Earnings (loss) before income taxes and noncontrolling interests	174	336	(162)	(48)%
Income tax (expense) benefit	(63)	(71)	8	(11)%
Net income (loss)	111	265	(154)	(58)%
Less: Net income attributable to noncontrolling interests	56	67	(11)	(16)%
Net income (loss) attributable to Tenneco Inc.	$ 55	$ 198	$ (143)	(72)%
Earnings (loss) per share				
Basic earnings (loss) per share:				
Earnings (loss) per share	$ 0.93	$ 3.75		
Weighted average shares outstanding	58,625,087	52,796,184		
Diluted earnings (loss) per share:				
Earnings (loss) per share	$ 0.93	$ 3.73		
Weighted average shares outstanding	58,758,732	53,026,911		

(a) Percentages above denoted as "n/m" are not meaningful to present in the table.

Revenues

Revenues increased by $2,489 million, or 27%, as compared to the year ended December 31, 2017. The Federal-Mogul Acquisition increased revenues by $1,886 million, or 20%. The remaining increase in revenues was primarily driven by the net favorable effects of organic growth from higher sales volume and mix of $597 million and the favorable effects of foreign currency exchange of $12 million, this was partially offset by a net unfavorable other of $6 million.

The following table lists the primary drivers behind the change in revenues ($ millions):

Year ended December 31, 2017	$ 9,274
Federal-Mogul Acquisition	1,886
Drivers in the change of organic revenues:	
Volume and mix	597
Currency exchange rates	12
Others	(6)
Year ended December 31, 2018	$ 11,763

Cost of sales
Cost of sales increased by $2,231 million, or 29%, as compared to the year ended December 31, 2017. The effect of the Federal-Mogul Acquisition increased cost of sales by $1,637 million, or 21%. The remaining increase in cost of sales was primarily driven by incremental costs related to higher sales volume and mix of $556 million, unfavorable materials sourcing of $13 million, an increase in other costs of $19 million, and the unfavorable effects of foreign currency exchange of $6 million.

The following table lists the primary drivers behind the change in cost of sales ($ millions):

Year ended December 31, 2017	$	7,771
Federal-Mogul Acquisition		1,637
Drivers in the change of organic cost of sales:		
Volume and mix		556
Material		13
Currency exchange rates		6
Others		19
Year ended December 31, 2018	$	10,002

Selling, general and administrative (SG&A)
SG&A increased by $120 million to $752 million compared to $632 million in the year ended December 31, 2017. The increase was primarily due to the effect of the Federal-Mogul Acquisition. Included in the year ended December 31, 2018 was $96 million of acquisition and expected separation costs, $25 million of cost to achieve synergies, $18 million of cost reduction initiatives, and $10 million related to a litigation settlement, while the year ended December 31, 2017 included a $132 million antitrust settlement accrual and $22 million in cost reduction initiatives.

Depreciation and amortization
Depreciation and amortization expense was $345 million for the year ended December 31, 2018 compared to $226 million for the year ended December 31, 2017. The increase was due primarily to the Federal-Mogul Acquisition.

Engineering, research, and development
Engineering, research, and development expense was $200 million for the year ended December 31, 2018 compared to $158 million for the year ended December 31, 2017. The increase was due primarily to the Federal-Mogul Acquisition.

Restructuring charges and asset impairments
Restructuring charges and asset impairments were $117 million for the year ended December 31, 2018 compared to $47 million for the year ended December 31, 2017. Costs incurred in each period primarily relate to facility closures. See Note 4, Restructuring Charges and Asset Impairments, in our consolidated financial statements included in Item 8 for additional information.

Goodwill impairment charges
As a result of our goodwill impairment assessment in the fourth quarter of 2018, we determined the fair value of one of our reporting units in the Ride Performance segment was lower than its carrying value. Accordingly, we recorded a full goodwill impairment charge of $3 million in the fourth quarter of 2018. This compared to an $11 million goodwill impairment related to our Ride Performance segment in the fourth quarter of 2017.

Non-service pension and postretirement benefit costs (credits)
Non-service pension and postretirement benefit costs was up $4 million to $20 million compared to $16 million for the year ended December 31, 2017.

Loss on extinguishment of debt
Loss on extinguishment of debt was $10 million for the year ended December 31, 2018 related to the repayment of our revolver and term loan A and the new refinancing in connection with the Federal-Mogul Acquisition. This compared to a $1 million charge recognized for the year ended December 31, 2017.

Interest expense
Interest expense was $148 million (substantially all in our U.S. operations) net of interest capitalized of $5 million for the year ended December 31, 2018 compared to $77 million (substantially all in our U.S. operations) net of interest capitalized of $6 million for the year ended December 31, 2017. The $71 million increase was primarily due to higher interest expense pertaining to the five-year $1.7 billion term loan A facility and the seven-year $1.7 billion term loan B facility that were entered into in

connection with the Federal-Mogul Acquisition and the interest expense on Federal-Mogul debt obligations assumed, partially offset by the lower interest expense as a result of the retirement of the Company's term loan A and revolver borrowings on October 1, 2018 related to the Federal-Mogul Acquisition.

Interest expense included losses on sales of accounts receivables, which was $16 million for the year ended December 31, 2018 and $5 million for the year ended December 31, 2017. The increase was primarily attributable to the Federal-Mogul Acquisition. For more detailed explanations on our debt structure and senior credit facility refer to "Liquidity and Capital Resources - Capitalization" later in this Management's Discussion and Analysis.

Income tax expense (benefit)
We reported income tax expense of $63 million on earnings before income taxes and noncontrolling interests of $174 million in 2018, as compared to income tax expense of $71 million on earnings before income taxes and noncontrolling interests of $336 million in 2017. The tax expense recorded for the year ended December 31, 2018 included tax benefits of $10 million relating to a valuation allowance release for entities in Australia and $11 million of tax expense for changes in the toll tax. On December 22, 2017, the Tax Cuts and Jobs Act ("TCJA") was enacted into U.S. law, which, among other provisions, lowered the corporate income tax rate effective January 1, 2018 from 35% to 21%, and implemented significant changes with respect to U.S. tax treatment of earnings originating from outside the U.S. Based on the new guidance, an $11 million discrete charge was recorded in income tax expense for the year ended December 31, 2018.

Net income (loss)
Net income was $111 million for 2018 as compared to $265 million for 2017, a decrease of $154 million, as result of the aforementioned items.

EBITDA including noncontrolling interests
The following table presents the reconciliation from EBITDA including noncontrolling interests to net income (loss) for the years ended December 31, 2018 and 2017 ($ in millions):

	Year Ended December 31	
	2018	2017
EBITDA including noncontrolling interests by Segment:		
Clean Air	$ 599	$ 564
Powertrain	93	—
Ride Performance	69	125
Motorparts	161	195
Corporate	(255)	(245)
Depreciation and amortization	(345)	(226)
Earnings before interest expense, income taxes, and noncontrolling interests	322	413
Interest expense	(148)	(77)
Income tax (expense) benefit	(63)	(71)
Net income (loss)	$ 111	$ 265

See "Segment Results of Operations" for further information on EBITDA including noncontrolling interests.

Segment Results of Operations

Revenues
The following table reflects our revenues for the years ended December 31, 2018 and 2017 ($ in millions):

	Segment Revenue									
	New Tenneco				DRiV					
	Clean Air		Powertrain		Ride Performance		Motorparts		Total Revenue	
	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017
Revenues	$ 6,707	$ 6,216	$ 1,112	$ —	$ 2,164	$ 1,807	$ 1,780	$ 1,251	$ 11,763	$ 9,274
Value-add revenues	4,207	4,029	1,112	—	2,164	1,807	1,780	1,251	9,263	7,087
Currency effect on value-add revenue	(31)	—	—	—	4	—	29	—	2	—
Value-add revenue excluding currency	$ 4,176	$ 4,029	$ 1,112	$ —	$ 2,168	$ 1,807	$ 1,809	$ 1,251	$ 9,265	$ 7,087
Substrate sales	$ 2,500	$ 2,187	$ —	$ —	$ —	$ —	$ —	$ —	$ 2,500	$ 2,187
Effect of Acquisitions	$ —	$ —	$ 1,112	$ —	$ 215	$ —	$ 559	$ —	$ 1,886	$ —

Light Vehicle Industry Production by Region for Years Ended December 31, 2018 and 2017 (Updated according to IHS Markit, January 2020)

	Year Ended December 31			
	2018	2017	Increase (Decrease)	% Increase (Decrease)
	(Number of Vehicles in Thousands)			
North America	16,959	17,064	(105)	(1)%
Europe	21,979	22,216	(237)	(1)%
South America	3,430	3,291	139	4 %
China	26,606	27,726	(1,120)	(4)%
India	4,720	4,457	263	6 %

Segment Revenue
Clean Air
Clean Air revenue increased $491 million to $6,707 million in 2018 compared to $6,216 million in 2017. Higher volumes drove a $486 million increase due to higher light vehicle revenues, higher commercial truck, off-highway and other vehicle sales, as well as new platforms. Currency had a $45 million favorable effect on Clean Air revenues.

Powertrain
As a result of the Federal-Mogul Acquisition, Powertrain revenue was $1,112 million for the year ended December 31, 2018.

Ride Performance
Ride Performance revenue increased $357 million to $2,164 million in 2018 compared to $1,807 million in 2017. The increase in revenues is partly due to the Federal-Mogul Acquisition. Higher volumes drove a $138 million increase due to increased light vehicle and commercial truck, off-highway and other vehicles and new platforms. Currency had a $4 million unfavorable effect on Ride Performance revenues.

Motorparts
Motorparts revenue increased $529 million to $1,780 million in 2018 compared to $1,251 million in 2017. The increase in revenues is partly due to the Federal-Mogul Acquisition. Offsetting the increase due to the acquisition was lower volumes and unfavorable mix and the unfavorable effects of foreign currency exchange of $29 million.

EBITDA including noncontrolling interests

The following table presents the EBITDA including noncontrolling interests by segment for the years ended December 31, 2018 and 2017 ($ in millions):

	Year Ended December 31		
	2018	2017	2018 vs 2017 Change
EBITDA including noncontrolling interests by Segment:			
Clean Air	$ 599	$ 564	$ 35
Powertrain	$ 93	$ —	$ 93
Ride Performance	$ 69	$ 125	$ (56)
Motorparts	$ 161	$ 195	$ (34)

The EBITDA including noncontrolling interests results shown in the preceding table include the following items, certain of which are discussed below under "Adjustments," which may have an effect on the comparability of EBITDA including noncontrolling interests results between periods:

	Reportable Segments						
	Clean Air	Powertrain	Ride Performance	Motorparts	Total	Corporate	Total
				(Millions)			
Year Ended December 31, 2018							
Costs to achieve synergies [1]:							
Restructuring related to synergy initiatives	$ 3	$ —	$ 10	$ 35	$ 48	$ 7	$ 55
Other cost to achieve synergies	—	—	1	1	2	5	7
Total costs to achieve synergies	3	—	11	36	50	12	62
Restructuring and related expenses:							
Other restructuring charges	11	(2)	43	7	59	(2)	57
Asset impairments	—	—	3	—	3	2	5
Total restructuring and related expenses	11	(2)	46	7	62	—	62
Cost reduction initiatives [3]	—	—	10	—	10	8	18
Warranty charge [10]	—	—	5	—	5	—	5
Litigation settlement accrual	—	—	9	—	9	1	10
Acquisition and expected separation costs[4]	—	—	—	—	—	96	96
Loss on extinguishment of debt [13]	—	—	—	—	—	10	10
Environmental charge [14]	—	—	—	—	—	4	4
Anti-dumping duty charge [15]	—	—	—	16	16	—	16
Pension charges [11]	—	—	3	—	3	—	3
Purchase accounting adjustments [5]	—	44	5	57	106	—	106
Goodwill impairment charge [16]	—	—	3		3		3
Total adjustments	$ 14	$ 42	$ 92	$ 116	$ 264	$ 131	$ 395
Year Ended December 31, 2017							
Restructuring and related expenses	$ 23	$ —	$ 16	$ 7	$ 46	$ 1	$ 47
Cost reduction initiatives [3]	4	—	12	3	19	3	22
Loss on extinguishment of debt [13]	—	—	—	—	—	1	1
Warranty settlement [10]	—	—	7	—	7	—	7
Goodwill impairment charge [16]	—	—	7	4	11	—	11
Pension charges/ stock vesting charges [17]	—	—	—	—	—	13	13
Antitrust settlement accrual [18]	—	—	—	—	—	132	132
Gain on sale of unconsolidated JV	—	—	—	—	—	(5)	(5)
Total adjustments	$ 27	$ —	$ 42	$ 14	$ 83	$ 145	$ 228

[1] Costs to achieve synergies related to the Acquisitions.
[2] Not used in the tables above.
[3] Costs related to cost reduction initiatives and related incentive and retention bonus programs.
[4] Costs related to the Acquisitions and expected separation.
[5] This primarily relates to a non-cash charge to cost of goods sold for the amortization of the inventory fair value step-up recorded as part of the Acquisitions.
[6] through [9] Not used in the tables above.

(10) Charge related to warranty. Although we regularly incur warranty costs, this specific charge was of an unusual nature in the period incurred.
(11) Charges related to curtailments and settlements of our pension and other postretirement benefit plans in connection with our derisking activities.
(12) Not used in the tables above.
(13) Loss on extinguishment of debt as a result of the refinancing of the revolving credit loan and tranche A term loan as a result of the Federal-Mogul Acquisition. See Note 11, Debt and Other Financing Arrangements, in our consolidated financial statements included in Item 8 for additional information.
(14) Environmental charge related to a site whereby an indemnification reverted back to the Company resulting from a 2019 bankruptcy filing of Mark IV Industries.
(15) Charges due to retroactive application of anti-dumping duty on a supplier's products.
(16) Non-cash asset impairment charge related to goodwill.
(17) Charges related to pension derisking and the acceleration of restricted stock vesting in accordance with the long-term incentive plan.
(18) Charges related to establishing a reserve for settlement costs necessary to resolve the Company's antitrust matters globally.

LIQUIDITY AND CAPITAL RESOURCES

Capitalization

	Year Ended December 31		
	2019	2018	% Change
	(millions)		
Short-term debt and maturities classified as current	$ 185	$ 153	21 %
Long-term debt	5,371	5,340	1 %
Total debt	5,556	5,493	1 %
Total redeemable noncontrolling interests	196	138	42 %
Total noncontrolling interests	194	190	2 %
Tenneco Inc. shareholders' equity	1,425	1,726	(17)%
Total equity	1,619	1,916	(16)%
Total capitalization	$ 7,371	$ 7,547	(2)%

Short-term debt, which primarily includes borrowings by the parent company and foreign subsidiaries was $185 million and $153 million as of December 31, 2019 and December 31, 2018. We had borrowings under our revolving credit facility of $183 million, which were classified as long-term debt, at December 31, 2019 and no borrowings at December 31, 2018.

The 2019 year-to-date decrease in our shareholders' equity primarily resulted from a net loss of $334 million and an increase in other comprehensive loss of $45 million as a result of the year-end remeasurement of our pension and other postretirement benefit obligations. This was partially offset by an increase in additional paid-in capital for a redeemable noncontrolling interest transaction with one of our owners of $53 million and the favorable effects of changes in foreign exchange rates on the translation of the operations of our foreign subsidiaries into U.S. dollars of $26 million.

Financing Arrangements

The table below shows our borrowing capacity on committed credit facilities as of December 31, 2019:

	Committed Credit Facilities[a] as of December 31, 2019				
	Term	Commitments	Borrowings	Letters of Credit[b]	Available
			(millions)		
Tenneco Inc. revolving credit agreement	2023	$ 1,500	$ 183	$ —	$ 1,317
Tenneco Inc. Term Loan A	2023	1,615	1,615	—	—
Tenneco Inc. Term Loan B	2025	1,683	1,683	—	—
Subsidiaries' credit agreements	2020-2028	168	159	—	9
		$ 4,966	$ 3,640	$ —	$ 1,326

(a) We are generally required to pay commitment fees on the unused portion of the total commitment.
(b) Letters of credit reduce the available borrowings under the revolving credit agreement.

The Company also has $60 million of outstanding letters of credit under uncommitted facilities at December 31, 2019.

New Credit Facility - General

On October 1, 2018, we entered into a new credit agreement with JPMorgan Chase Bank, N.A., as administrative agent and other lenders (the "New Credit Facility") in connection with the acquisition of Federal-Mogul, which has been amended by the first amendment, dated February 14, 2020 (the "First Amendment"), and by the second amendment, dated February 14, 2020 (the "Second Amendment"). The New Credit Facility consists of $4.9 billion of total debt financing, consisting of a five-year $1.5 billion revolving credit facility, a five-year $1.7 billion term loan A facility ("Term Loan A") and a seven-year $1.7 billion term loan B facility ("Term Loan B"). We paid $8 million in one-time fees in connection with the First Amendment and Second Amendment.

Proceeds from the New Credit Facility were used to finance the cash consideration portion of the Federal-Mogul Acquisition purchase price, to refinance our then existing senior credit facilities, inclusive of the revolver and the tranche term loan A then outstanding (the "Old Credit Facility"), certain senior credit facilities of Federal-Mogul, to pay fees and expenses related to the acquisition, and the financing thereof. The remainder, including future borrowings under the revolving credit facility, will be used for general corporate purposes.

We and our wholly-owned subsidiary, Tenneco Automotive Operating Company Inc., are borrowers under the New Credit Facility, and we are the sole borrower under the Term Loan A and Term Loan B facilities. The New Credit Facility is guaranteed on a senior basis by certain of our material domestic subsidiaries. Drawings under the revolving credit facility may be in U.S. dollars, British pounds or euros.

The New Credit Facility is secured by substantially all of our domestic assets, our subsidiary guarantors, and by pledges of up to 66% of the stock of certain first-tier foreign subsidiaries. The security for the New Credit Facility is pari passu with the security for the outstanding senior secured notes of Federal-Mogul that we assumed in connection with the acquisition. If any of our foreign subsidiaries is added to the revolving credit facility as a borrower, the obligations of such foreign borrower will be secured by the assets of such foreign borrower, and also will be secured by the assets of, and guaranteed by, the domestic borrowers and domestic guarantors as well as certain of our foreign subsidiaries in the chain of ownership of such foreign borrower.

As a result of the refinancing of the revolving credit loan and tranche A term loan under the Old Credit Facility, we recorded a loss on extinguishment of debt of $10 million for the year ended December 31, 2018, primarily consisting of debt issuance costs incurred at the transaction date and write-off of deferred debt issuance costs related to the refinanced revolving credit loan and tranche A term loan. We also recorded $1 million of loss on extinguishment of debt for the year ended December 31, 2017 related to amendment and restatement of the Old Credit Facility and the write off of deferred debt issuance costs related to the Old Credit Facility.

New Credit Facility - Interest Rates and Fees
At December 31, 2019, the interest rate on borrowings under the revolving credit facility and the Term Loan A facility was initially LIBOR plus 1.75%, and would change to 1.50% if our consolidated net leverage ratio were less than 2.5 to 1 and greater than or equal to 1.5 to 1, and would change to 1.25% if the net leverage ratio were less than 1.5 to 1. After giving effect to the First Amendment, the interest rate on borrowings under the revolving credit facility and the Term Loan A facility increased from LIBOR plus 1.75% to LIBOR plus 2.00% and will remain at LIBOR plus 2.00% for each relevant period for which Company's consolidated net leverage ratio (as defined in the New Credit Facility) is equal to or greater than 3.0 to 1. The First Amendment does not change the step-down of the interest rate at lower consolidated net leverage ratios, which steps down to (a) LIBOR plus 1.75% if the Company's consolidated net leverage ratio is less than 3.0 to 1 and greater than or equal to 2.5 to 1, (b) LIBOR plus 1.50% if the consolidated net leverage ratio is less than 2.5 to 1 and greater than or equal to 1.5 to 1, and (c) LIBOR plus 1.25% if the consolidated net leverage ratio is less than 1.5 to 1.

Initially, and so long as our corporate family rating is Ba3 (with a stable outlook) or higher from Moody's Investors Service, Inc. ("Moody's") and BB- (with a stable outlook) or higher from Standard & Poor's Financial Services LLC ("S&P"), the interest rate on borrowings under the Term Loan B facility will be LIBOR plus 2.75%; at any time the foregoing conditions are not satisfied, the interest rate on the Term Loan B facility will be LIBOR plus 3.00%. When the Term Loan B facility is no longer outstanding and we and our subsidiaries have no other secured indebtedness (with certain exceptions set forth in the New Credit Facility), and upon our achieving and maintaining two or more corporate credit and/or corporate family ratings higher than or equal to BBB- from S&P, BBB- from Fitch Ratings Inc. ("Fitch") and/or Baa3 from Moody's (in each case, with a stable or positive outlook), the collateral under the New Credit Facility may be released. On June 3, 2019, Moody's lowered our corporate family rating to B1 and the interest rate on borrowings under the term loan B was raised to LIBOR plus 3.00%.

New Credit Facility - Other Terms and Conditions
The New Credit Facility contains representations and warranties, and covenants which are customary for debt facilities of this type. The covenants limit our ability and the ability of our restricted subsidiaries to, among other things, to (i) incur additional indebtedness or issue preferred stock, (ii) pay dividends or make distributions to our stockholders, (iii) purchase or redeem our equity interests, (iv) make investments, (v) create liens on our assets, (vi) enter into transactions with our affiliates, (vii) sell assets and (viii) merge or consolidate with, or dispose of substantially all of our assets to, other companies. The First Amendment further tightened the restrictions on our ability to pay dividends and make distributions to our stockholders, to make investments and to increase the size of the revolving credit facility, the term loan A facility or the term Loan B facility. The Second Amendment provided greater flexibility for us to apply, at our discretion, the net cash proceeds from a spin-off of DRiV to prepay the senior secured notes, Term Loan A or Term Loan B (subject to the terms of the senior note indentures).

The New Credit Facility includes customary events of default and other provisions that could require all amounts due thereunder to become immediately due and payable, either automatically or at the option of the lenders, if we fail to comply with the terms of the New Credit Facility or if other customary events occur.

The New Credit Facility also contains two financial maintenance covenants for the revolving credit facility and the Term Loan A facility. At December 31, 2019, these financial maintenance covenants include (i) a requirement to have a consolidated net leverage ratio (as defined in the New Credit Facility) as of the end of each fiscal quarter of not greater than 4.0 to 1 through September 30, 2019, 3.75 to 1 through September 30, 2020 and 3.5 to 1 thereafter; and (ii) a requirement to maintain a consolidated interest coverage ratio (as defined in the New Credit Facility) for any period of four consecutive fiscal quarters of not less than 2.75 to 1. After giving effect to the First Amendment, these financial maintenance covenants include (i) a requirement to have a consolidated net leverage ratio (as defined in the New Credit Facility) as of the end of each fiscal quarter of not greater than 4.50 to 1 through March 31, 2021, 4.25 to 1 through September 30, 2021, 4.00 to 1 through March 31, 2022, 3.75 to 1 through September 30, 2022, and 3.5 to 1 thereafter; and (ii) a requirement to maintain a consolidated interest coverage ratio (as defined in the New Credit Facility) for any period of four consecutive fiscal quarters of not less than 2.75 to 1.

The financial ratios required under the New Credit Facility and the actual ratios we calculated as of December 31, 2019 and 2018 are as follows: leverage ratio of 3.46 and 2.74 actual versus 3.75 (maximum) required; and interest coverage ratio of 5.38 and 6.50 actual versus 2.75 (minimum) required.

The covenants in our New Credit Facility generally prohibit us from repaying or refinancing certain subordinated indebtedness. So long as no default exists, we would, however, under our New Credit Facility, be permitted to repay or refinance subordinated indebtedness (i) with the net cash proceeds of permitted refinancing indebtedness (as defined in the New Credit Facility); (ii) in an amount equal to the net cash proceeds of qualified capital stock (as defined in the New Credit Facility) issued after October 1, 2018 and (iii) in exchange for qualified capital stock issued after October 1, 2018; or (iv) with additional payments provided that such additional payments are subject to compliance with the consolidated leverage ratio set forth below after giving effect to such additional payments. Prior to the effectiveness of the First Amendment, the amount of such additional payments in respect of subordinated debt were capped as set forth below:

Pro forma Consolidated Leverage Ratio	Prior to Spin-Off	Post Spin-Off
	(millions)	
Greater than 2.25x	$ 360	$360 x Post Spin-Off EBITDA/Pre Spin-Off EBITDA
Equal to or less than 2.25x	unlimited	unlimited

After giving effect to the First Amendment, such additional payments on subordinated indebtedness (x) will no longer be permitted at any time the pro forma consolidated leverage ratio is greater than 2.00 to 1 after giving effect to such additional payments and (y) will be permitted in an unlimited amount at any time the pro forma consolidated leverage ratio is equal to or less than 2.00 to 1 after giving effect to such additional payments.

Although the New Credit Facility agreement would permit us to repay or refinance our senior notes under certain conditions, any repayment or refinancing of our outstanding notes would be subject to market conditions and either the voluntary participation of note holders or our ability to redeem the notes under the terms of the applicable note indenture. For example, while the New Credit Facility agreement would allow us to repay our outstanding notes via a direct exchange of the notes for either permitted refinancing indebtedness or for shares of our common stock, we do not, under the terms of the agreements governing our outstanding notes, have the right to refinance the notes via any type of direct exchange.

The New Credit Facility agreement also contains other restrictions on our operations that are customary for similar facilities, including limitations on: (i) incurring additional liens; (ii) sale and leaseback transactions (except for the permitted transactions as described in the New Credit Facility agreement); (iii) liquidations and dissolutions; (iv) incurring additional indebtedness or guarantees; (v) investments and acquisitions; (vi) dividends and share repurchases; (vii) mergers and consolidations; and (viii) refinancing of the senior notes. Compliance with these requirements and restrictions is a condition for any incremental borrowings under the New Credit Facility agreement and failure to meet these requirements enables the lenders to require repayment of any outstanding loans.

At December 31, 2019, we were in compliance with all the financial covenants and operational restrictions of the New Credit Facility.

Senior Notes

A summary of our senior unsecured and secured notes as of December 31, 2019 are as follows:

	2019		
	Principal	Carrying Amount[a]	Effective Interest Rate
	(millions)		
Senior Unsecured Notes			
$225 million of 5.375% Senior Notes due 2024	$ 225	$ 222	5.609%
$500 million of 5.000% Senior Notes due 2026	$ 500	$ 494	5.219%
Senior Secured Notes			
€415 million 4.875% Euro Fixed Rate Notes due 2022	$ 465	$ 479	3.599%
€300 million of Euribor plus 4.875% Euro Floating Rate Notes due 2024	$ 336	$ 340	4.620%
€350 million of 5.000% Euro Fixed Rate Notes due 2024	$ 392	$ 413	3.823%

[a] Carrying amount is net of unamortized debt issuance costs and debt discounts or premiums. Total unamortized debt issuance costs were $76 million as of December 31, 2019. Total unamortized debt (premium) discount, net was $(37) million as of December 31, 2019.

Senior Unsecured Notes

At December 31, 2019, we have outstanding our 5.375% senior unsecured notes due December 15, 2024 ("2024 Senior Notes") and 5% senior unsecured notes due July 15, 2026 ("2026 Senior Notes" and together with the 2024 Senior Notes, the "Senior Unsecured Notes"). Under the indentures covering the Senior Unsecured Notes, we are permitted to redeem some or all of the outstanding Senior Unsecured Notes, at specified redemption prices that decline to par over a specified period, at any time (a) on or after December 15, 2019, in the case of the 2024 Senior Notes and (b) on or after July 15, 2021, in the case of the 2026 Senior Notes. In addition, the Senior Unsecured Notes may also be redeemed at any time at a redemption price generally equal to 100% of the principal amount thereof plus a "make-whole premium" as set forth in the indentures. We did not redeem any of the Senior Unsecured Notes during the year ended December 31, 2019.

If we experience specified kinds of changes in control, we must offer to repurchase the Senior Unsecured Notes at 101% of the principal amount thereof plus accrued and unpaid interest. In addition, if we sell certain of our assets and do not apply the proceeds from the sale in a certain manner within 365 days of the sale, we must use such unapplied sales proceeds to make an offer to repurchase the 2024 Senior Notes at 100% of the principal amount thereof plus accrued and unpaid interest.

Senior Secured Notes

In connection with the Acquisition of Federal-Mogul, we assumed (i) €350 million aggregate principal amount of 5.000% euro denominated secured due July 15, 2024 ("5.000% Euro Fixed Rate Notes"), (ii) €415 million aggregate principle amount of 4.875% euro denominated senior secured fixed rate notes due April 15, 2022 ("4.875% Euro Fixed Rate Notes"), and (iii) €300 million aggregate principal amount of floating rate senior secured notes due April 15, 2024 ("Euro Floating Rate Notes," and together with the 5.000% Euro Fixed Rate Notes and the 4.875% Euro Fixed Rate Notes, the "Senior Secured Notes") which were outstanding at December 31, 2019. The Senior Secured Notes are secured equally and ratably by a pledge of substantially all the Company's subsidiaries' domestic assets and by pledges of up to 66% of the stock of certain first-tier foreign subsidiaries. The security for the Senior Secured Notes is pari passu with the security for the New Credit Facility.

We are permitted to redeem some or all of the outstanding Senior Secured Notes at specified redemption prices that decline to par over a specified period, at any time (a) on or after July 15, 2020, in the case of the 5.000% Euro Fixed Rate Notes, (b) on or after April 15, 2019, in the case of the 4.875% Euro Fixed Rate Notes and (c) on or after April 15, 2018, in the case of the Euro Floating Rate Notes. Prior to July 15, 2020, we may also redeem the 5.00% Euro Fixed Rate Notes at any time at a redemption price equal to 100% of the principal amount thereof plus a "make-whole premium" as set forth in the indenture. Further, we may also redeem up to 40% of the 5.000% Euro Fixed Rate Notes with the proceeds of certain equity offerings at any time prior to July 15, 2020 at a redemption price of 105.0% of the principle amount thereto.

If we experience specified kinds of changes in control, we must offer to repurchase the Senior Secured Notes at 101% of the principal amount thereof plus accrued and unpaid interest. In addition, if we sell certain of our assets and do not apply the proceeds from the sale in a certain manner within 365 days of the sale, we must use such unapplied sales proceeds to make an offer to repurchase the Senior Secured Notes at 100% of the principal amount thereof plus accrued and unpaid interest.

We have designated a portion of the Senior Secured Notes as a net investment hedge of our European operations. As such, the fluctuations in foreign currency exchange rates on the value of the designated Senior Secured Notes is recorded to cumulative translation adjustment. See Note 9, Derivatives and Hedging Activities for further details.

Senior Unsecured Notes and Senior Secured Notes - Other Terms and Conditions
Our Senior Unsecured Notes and Senior Secured Notes contain covenants that will, among other things, limit our ability and the ability of our subsidiaries to create liens on their assets and enter into sale and leaseback transactions. In addition, the indentures governing our Senior Secured Notes and 2024 Senior Unsecured Notes contain covenants that restrict our ability and the ability of our subsidiaries to: (i) incur additional indebtedness; (ii) pay dividends or make other distributions to the holders of our capital stock; (iii) repurchase our capital stock; (iv) make investments; (v) sell assets; and (vi) undertake mergers and consolidations.

Subject to limited exceptions, all of our existing and future material domestic wholly owned subsidiaries fully and unconditionally guarantee our Senior Unsecured Notes and Senior Secured Notes on a joint and several basis. There are no significant restrictions on the ability of the subsidiaries that have guaranteed these notes to make distributions to us.

As of December 31, 2019, we were in compliance with the covenants and restrictions of these indentures.

Other Debt
Other debt consists primarily of subsidiary debt.

On-Balance Sheet Arrangements
We have securitization programs for some of our accounts receivable, with limited recourse provisions. Borrowings on these securitization programs are recorded in short-term debt.

Borrowings on these securitization programs at December 31, 2019 and 2018 are as follows:

	As of December 31	
	2019	2018
	(millions)	
Borrowings on securitization programs	$ 4	$ 6

Off-Balance Sheet Arrangements
On December 14, 2017, we entered into a new accounts receivable factoring program in the U.S. with a commercial bank. Under this program we sell receivables from certain of our U.S. OE customers at a rate that is favorable versus our senior credit facility. This arrangement is uncommitted and provides for cancellation by the commercial bank with no less than 30 days prior written notice. The amount of outstanding third-party investments in our accounts receivable sold under this program was $222 million and $130 million at December 31, 2019 and 2018.

The Company has two other receivable factoring programs in the U.S. with commercial banks under which we sell receivables from certain of our aftermarket customers to whom we have extended payment terms. Both arrangements are uncommitted and may be terminated with 10 days prior notice for one program and 30 days prior notice for the other program. The amount of outstanding third-party investments in our accounts receivable sold under these programs was $336 million and $387 million at December 31, 2019 and 2018.

The Company also has subsidiaries in several countries in Europe that are parties to accounts receivable factoring facilities. The commitments for these arrangements are generally for one year, but some may be canceled with notice 90 days prior to renewal. In some instances, the arrangement provides for cancellation by the applicable financial institution at any time upon notification. The amount of outstanding third-party investments in our accounts receivable sold under programs in Europe was $289 million and $361 million at December 31, 2019 and 2018.

These factoring programs provide us with access to cash at costs that are generally favorable to alternative sources of financing, and allow us to reduce borrowings under our revolving credit agreement. If we were not able to factor receivables under either the European or U.S. programs, our borrowings under our revolving credit agreement might increase, although this could be partially mitigated by exercising our right to shorten payment terms with certain of the aftermarket customers whose receivables we sell under the U.S. factoring programs in the event that those factoring programs are terminated.

In the U.S and Canada, we participate in supply chain financing programs with certain of our aftermarket customers to whom we have extended payment terms whereby the accounts receivable are satisfied through the early receipt of negotiable financial instruments that are payable at a later date when payments from our customers are due. We sell these financial instruments before their maturity date to various financial institutions at a discount. Such financial instruments sold to financial institutions with outstanding maturity dates totaled $190 million and $133 million at December 31, 2019 and 2018.

If these supply chain financing programs with our participating aftermarket customers were terminated or the financial institutions that currently participate in these programs were to reduce their purchases, our borrowings under our revolving credit agreement might increase, although this could be partially mitigated by exercising our right to shorten payment terms with certain of the aftermarket customers whose accounts receivable we sell under the U.S. and Canadian programs in the event that those programs are terminated or otherwise reduced.

The amount of accounts receivable outstanding and derecognized for these factoring and drafting arrangements was $1.0 billion and $1.0 billion as of December 31, 2019 and 2018. In addition, the outstanding deferred purchase price receivable was $33 million and $24 million as of December 31, 2019 and 2018.

Proceeds from the factoring of accounts receivable qualifying as sales and drafting programs was $5.0 billion, $3.4 billion, and $2.0 billion for the years ended December 31, 2019, 2018, and 2017.

Expenses associated with these arrangements for the years ended December 31, 2019, 2018, and 2017 are as follows:

	Year Ended December 31		
	2019	2018	2017
		(millions)	
Loss on sale of receivables [(a)]	$ 31	$ 16	$ 5

(a) Included in interest expense within the consolidated statements of income (loss).

Supply Chain Financing
Certain of our suppliers in the U.S. participate in supply chain financing programs under which they securitize their accounts receivables from us. Financial institutions participate in the supply chain financing programs on an uncommitted basis and can cease purchasing receivables or drafts from our suppliers at any time. If the financial institutions did not continue to purchase receivables or drafts from our suppliers under these programs, the participating vendors may have a need to renegotiate their payment terms with us which in turn could cause our borrowings under our revolving credit facility to increase. The amount of outstanding accounts receivables and drafts sold by our suppliers under these programs were $33 million and $54 million at December 31, 2019 and 2018. We are in the process of winding down these programs and expect to end them by mid-2020.

Capital Requirements
We believe that cash flows from operations, combined with our cash on hand, subject to any applicable withholding taxes upon repatriation of cash balances from our foreign operations where most of our cash balances are located, and available borrowing capacity described above, assuming that we maintain compliance with the financial covenants and other requirements of the New Credit Facility, will be sufficient to meet our future capital requirements, including debt amortization, capital expenditures, pension contributions, and other operational requirements, for the following year. Our ability to meet the financial covenants depends upon a number of operational and economic factors, many of which are beyond our control. In the event that we are unable to meet these financial covenants, we would consider several options to meet our cash flow needs. Such actions include additional restructuring initiatives and other cost reductions, sales of assets, reductions to working capital and capital spending, issuance of equity and other alternatives to enhance our financial and operating position. Should we be required to implement any of these actions to meet our cash flow needs, we believe we can do so in a reasonable time frame.

Cash Flows

Operating Activities
As summarized in the table below, net cash provided by operating activities for the years ended December 31, 2019, 2018, and 2017 were as follows:

	Year Ended December 31		
	2019	2018	2017
		(millions)	
Operational cash flow before changes in operating assets and liabilities	$ 532	$ 433	$ 502
Changes in operating assets and liabilities:			
Receivables	(225)	(174)	(76)
Inventories	284	27	(94)
Payables and accrued expenses	(66)	291	136
Accrued interest and income taxes	3	(19)	1
Other assets and liabilities	(84)	(119)	48
Total change in operating assets and liabilities	(88)	6	15
Net cash provided (used) by operating activities	$ 444	$ 439	$ 517

Cash provided by operations for the year ended December 31, 2019 increased by $5 million compared to the year ended December 31, 2018. The net increase was primarily the result of:

- an improvement in operational cash flow before changes in operating assets and liabilities of $99 million resulting from the full year inclusion of the operating results of Federal-Mogul; and
- offset by an increase in cash used by working capital of $94 million. The $94 million decrease in working capital items was primarily driven by an increase in factored receivables that are shown as proceeds from deferred purchase price of factored receivables in the investing activities, partially offset by a reduction of inventory levels.

Cash provided by operations for the year ended December 31, 2018 decreased by $78 million compared to the year ended December 31, 2017. The net decrease was primarily the result of:

- cash flows provided by the operations of Federal-Mogul, which was acquired in the fourth quarter of 2018, of approximately $234 million, this included a cash outflow of $61 million related to the settlement of a litigation matter that was assumed as part of the Federal-Mogul Acquisition (see Note 3, Acquisitions and Divestitures for further information);
- offset by a $88 million outflow in working capital items (excluding changes in working capital of the acquired Federal-Mogul operations);
- an increase in cash payments for interest of $36 million; and
- other one-time charges of approximately $180 million, including, among other items, transactional related costs and advisory fees in connection with the Federal-Mogul Acquisition, and an antitrust settlement payment.

Investing Activities

	Year Ended December 31		
	2019	2018	2017
		(millions)	
Acquisitions, net of cash acquired	$ (158)	$ (2,194)	$ —
Proceeds from sale of assets	20	9	8
Net proceeds from sale of business	22	—	—
Proceeds from sale of investment in nonconsolidated affiliates	2	—	9
Cash payments for plant, property, and equipment	(744)	(507)	(419)
Proceeds from deferred purchase price of factored receivables	250	174	112
Other	2	4	(10)
Net cash provided (used) by investing activities	$ (606)	$ (2,514)	$ (300)

In 2019, cash used by the Öhlins Acquisition, net of cash acquired, was $158 million. See "Note 3, Acquisitions and Divestitures" for additional details. We also received $22 million in cash for the sale of our wipers business that was part of our Motorparts segment.

Capital expenditures were $744 million, $507 million, and $419 million for the years ended December 31, 2019, 2018, and 2017. These capital expenditures were primarily related to investing in new facilities, upgrading existing products, continuing new product launches, and infrastructure and equipment at our facilities (including investments in software-related intangible assets) to support our manufacturing, distribution, and cost reduction efforts. For 2020, we expect our capital expenditures to be between $610 million and $650 million, depending on timing of expenditures, as we continue to invest in our strategic priorities and growth.

Proceeds from deferred purchase price of factored receivables was $250 million, $174 million, and $112 million for the years ended December 31, 2019, 2018, and 2017. This increase in 2019 as compared to 2018 is primarily attributable to the Federal-Mogul Acquisition.

Financing Activities

	Year Ended December 31		
	2019	2018	2017
		(millions)	
Proceeds from term loans and notes	$ 200	$ 3,426	$ 160
Repayments of term loans and notes	(341)	(453)	(36)
Borrowings on revolving lines of credit	9,120	5,149	6,664
Payments on revolving lines of credit	(8,884)	(5,405)	(6,737)
Repurchase of common shares	(2)	(1)	(1)
Cash dividends	(20)	(59)	(53)
Debt issuance cost of long-term debt	—	(95)	(8)
Purchase of common stock under the share repurchase program	—	—	(169)
Net decrease in bank overdrafts	(13)	(5)	(7)
Acquisition of additional ownership interest in consolidated affiliates	(10)	—	—
Distributions to noncontrolling interest partners	(43)	(51)	(64)
Other	(4)	(30)	—
Net cash provided (used) by financing activities	$ 3	$ 2,476	$ (251)

Cash flow provided by financing activities was $3 million for the year ended December 31, 2019. This included borrowings under term loans of $200 million, repayments of term loans of $341 million, and net borrowings under revolving lines of credit of $236 million. In addition, we acquired additional ownership interests in three of our consolidated subsidiaries from the noncontrolling interest partners for $10 million and had distributions to noncontrolling interest partners of $43 million.

Cash flow provided by financing activities was $2,476 million for the year ended December 31, 2018. On October 1, 2018, we issued an aggregate principal amount of $3,400 million as a part of our New Credit Facility, entered into in conjunction with the Federal-Mogul Acquisition. As a part of this New Credit facility we refinanced the revolving credit agreement and tranche A term loan under the Old Credit facility. This included borrowings under term loans of $3,426 million, repayments of term loans of $453 million, and net repayments under revolving lines of credit of $256 million. We also had distributions to noncontrolling interest partners of $51 million.

Cash flow used in financing activities was $251 million for the year ended December 31, 2017. This included $160 million borrowings under term loans and $36 million repayment of terms loans. We also had distributions to noncontrolling interest partners of $64 million.

We did not repurchase any shares during 2019 or 2018. During 2017, we repurchased 2,936,950 shares of our outstanding common stock for $169 million at an average price of $57.57 per share. In February 2017, the Board authorized the repurchase of up to $400 million of common stock over the next three years. This amount includes the remaining $112 million amount authorized under earlier repurchase programs. The remaining $231 million authorized for share repurchases in the 2017 Program expired on December 31, 2019.

Borrowings under our revolving credit facility were $183 million at December 31, 2019. In addition, we had $4 million and $6 million borrowed under our accounts receivable securitization programs at December 31, 2019 and 2018.

Dividends on Common Stock
We suspended the quarterly dividend in the second quarter of 2019. For the year ended December 31, 2019, we paid dividends of $0.25 per share, or $20 million. For the year ended December 31, 2018, we paid dividends of $0.25 per share in each of the quarters, or $59 million in the aggregate. Our dividend program and the payment of any future cash dividends are subject to continued capital availability, the judgment of our Board of Directors and our continued compliance with the provisions pertaining to the payment of dividends under our debt agreements.

Contractual Obligations
Our remaining required debt principal amortization and payment obligations under lease and certain other financial commitments as of December 31, 2019 are shown in the following table:

	Payments due by period:				
	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
			(millions)		
Revolver borrowings	$ 183	$	$	$ 183	$ —
Senior term loans	3,298	102	332	1,266	1,598
Senior notes	1,918	—	465	953	500
Other subsidiary debt and finance lease obligations	14	4	5	3	2
Short-term debt (including bank overdrafts)	181	181			—
Total debt obligations	5,594	287	802	2,405	2,100
Pension obligations	1,048	117	228	224	479
Operating leases	367	111	145	71	40
Purchase obligations [a]	240	240	—	—	—
Interest payments	958	244	414	261	39
Capital commitments	106	106	—	—	—
Total payments	$ 8,313	$ 1,105	$ 1,589	$ 2,961	$ 2,658

[a] Short-term, ordinary course payment obligations have been excluded.

If we do not maintain compliance with the terms of our New Credit Facility or senior notes indentures described above, all amounts under those arrangements could, automatically or at the option of the lenders or other debt holders, become due. Additionally, each of those facilities contains provisions that certain events of default under one facility will constitute a default under the other facility, allowing the acceleration of all amounts due. We currently expect to maintain compliance with the terms of all of our various credit agreements for the foreseeable future.

Included in our contractual obligations is the amount of interest to be paid on our long-term debt. As our debt structure contains both fixed and variable rate obligations, we have made assumptions in calculating the amount of future interest payments. Interest on our Senior Unsecured Notes is calculated using the fixed rates of 5.375% and 5.000%, and interest on our fixed rate Senior Secured Notes is calculated using the fixed rates of 4.875% and 5.000%. Interest on our variable rate debt is calculated as LIBOR plus the applicable margin in effect at December 31, 2019 for our term loans, and Euribor plus the applicable margin in effect at December 31, 2019 for our floating rate euro notes. We have assumed that both LIBOR and the Euribor rates will remain unchanged for the outlying years.

We have also included an estimate of expenditures required after December 31, 2019 to complete the projects authorized at December 31, 2019, in which we have made substantial commitments in connection with purchasing property, plant and equipment for our operations. For 2020, we expect our capital expenditures to be between $610 million and $650 million.

We have included an estimate of the expenditures necessary after December 31, 2019 to satisfy purchase requirements pursuant to certain ordinary course supply agreements that we have entered into. With respect to our other supply agreements, they generally do not specify the volumes we are required to purchase. In many cases, if any commitment is provided, the agreements state only the minimum percentage of our purchase requirements we must buy from the supplier. As a result, these purchase obligations fluctuate from year-to-year and we are not able to quantify the amount of our future obligations.

We have not included material cash requirements for unrecognized tax benefits or taxes. It is difficult to estimate taxes to be paid as changes in where we generate income can have a significant effect on our future tax payments. We have also not included cash requirements for funding pension and postretirement benefit costs. Based upon current estimates, we believe we will be required to make contributions of approximately $117 million to those plans in 2020. Pension and postretirement contributions beyond 2020 will be required but those amounts will vary based upon many factors, including the performance of its pension fund investments during 2020 and future discount rate changes. For additional information relating to the funding of our pension and other postretirement plans, see Note 13, Pension Plans, Postretirement and Other Employee Benefits, in our consolidated financial statements included in Item 8 for additional information. In addition, we have not included cash requirements for environmental remediation. Based upon current estimates, we believe we will be required to spend approximately $40 million over the next 30 years. However, due to possible modifications in remediation processes and other factors, it is difficult to determine the actual timing of the payments. See Note 15, Commitments and Contingencies, in our consolidated financial statements included in Item 8 for additional information.

We occasionally provide guarantees that could require it to make future payments in the event that the third-party primary obligor does not make its required payments. The Company is not required to record a liability for any of these guarantees.

Additionally, we have from time to time issued guarantees for the performance of obligations by some of our subsidiaries, and some of our subsidiaries have guaranteed our debt. All of our existing and future material domestic subsidiaries fully and unconditionally guarantee its New Credit Facility and its senior notes on a joint and several basis. The New Credit Facility is also secured by first-priority liens on substantially all our domestic assets and pledges of up to 66% of the stock of certain first-tier foreign subsidiaries. As described above, certain of our senior notes are secured by pledges of stock and assets.

CRITICAL ACCOUNTING ESTIMATES

We prepare our consolidated financial statements in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP"), which requires us to make estimates and assumptions that affect the reported amounts and disclosures in our consolidated financial statements. These estimates are subject to an inherent degree of uncertainty and actual results could differ from our estimates. Our significant accounting policies have been disclosed in Note 2, Summary of Significant Accounting Policies. The following paragraphs include a discussion of some critical areas where estimates are required.

Goodwill and Other Indefinite-Lived Intangible Assets

We evaluate goodwill for impairment during the fourth quarter of each year, or more frequently if events or circumstances indicate goodwill might be impaired. We perform assessments at the reporting unit level by comparing the estimated fair value of our reporting units with goodwill to the carrying value of the reporting unit to determine if a goodwill impairment exists. If the carrying value of our reporting units exceeds the fair value, the goodwill is considered impaired. Our assessment of fair value utilizes a combination of the income approach, market approach, and, in instances where a reporting unit's free cash flows do not support the value of the underlying assets, an asset approach. In our assessment, for reporting units where the free cash flows support the value of the underlying assets, we apply a 75% weighting to the income approach and a 25% weighting to the market approach. The most significant inputs in estimating the fair value of our reporting units under the income approach are (i) projected operating margins, (ii) the revenue growth rate, and (iii) the discount rate, which is risk-adjusted based on the aforementioned inputs.

Similar to goodwill, we evaluate our indefinite-lived trade names and trademarks for impairment during the fourth quarter of each year, or more frequently if events or circumstances indicated the assets might be impaired. We perform a quantitative assessment of estimating fair values based upon the prospective stream of hypothetical after-tax royalty cost savings discounted at rates that reflect the rates of return appropriate for these intangible assets. The primary, and most sensitive, inputs utilized in determining fair values of trade names and trademarks are (i) projected branded product sales, (ii) the revenue growth rate, (iii) the royalty rate, and (iv) the discount rate, which is risk-adjusted based on the projected branded sales.

The basis of the goodwill impairment and indefinite-lived intangible asset impairment analyses is our annual budget and three-year strategic plan. This includes a projection of future cash flows based on new products, awarded business, customer commitments, and independent market data, which requires us to make significant assumptions and estimates about the extent and timing of future cash flows and revenue growth rates. These estimates and assumptions are subject to a high degree of uncertainty.

While we believe the assumptions and estimates used to determine the estimated fair values are reasonable, due to the many variables inherent in estimating fair value and the relative size of the goodwill and indefinite-lived intangible assets, differences in assumptions could have a material effect on the results of our analysis. Refer to Note 7, Goodwill and Other Intangible Assets, in our consolidated financial statements included in Item 8 for additional information regarding our goodwill and indefinite-lived intangible assets.

Impairment of Long-Lived Assets and Definite-Lived Intangible Assets

We monitor our long-lived and definite-lived intangible assets for impairment indicators on an on-going basis. If impairment indicators exist, we perform the required impairment analysis by comparing the undiscounted cash flows expected to be generated from the long-lived asset groups to the related net book values. If the net book value of the asset group exceeds the undiscounted cash flows, an impairment loss is recognized. Even if an impairment charge is not recognized, a reassessment of the useful lives over which depreciation or amortization is being recognized may be appropriate based on our assessment of the recoverability of these assets.

We estimate cash flows and fair value using internal budgets based on recent sales data, new products, awarded business, customer commitments, and independent market data. The key factors that affect our estimates are (1) future production estimates; (2) customer preferences and decisions; (3) product pricing; (4) manufacturing and material cost estimates; and (5) product life / business retention. Any differences in actual results from the estimates could result in fair values different from the estimated fair values, which could materially affect our future results of operations and financial condition. We believe the projections of anticipated future cash flows and fair value assumptions are reasonable; however, changes in assumptions underlying these estimates could affect our valuations.

Pension and Other Postretirement Benefits

The Company sponsors defined benefit pension and postretirement benefit plans for certain employees and retirees around the world. Its defined benefit plans are accounted for on an actuarial basis, which requires the selection of various assumptions, including an expected long-term rate of return, discount rate, mortality rates of participants, expected rates of mortality improvement, and health care cost trend rates.

The approach to establishing the discount rate assumption for both our domestic and international plans is based on high-quality corporate bonds. The weighted-average discount rates used to calculate net periodic benefit cost for 2019 and year-end obligations as of December 31, 2019 were as follows:

	Pension Benefits		
	U.S. Plans	Non-U.S. Plans	Other Postretirement Benefits
Used to calculate net periodic benefit cost	4.2%	2.6%	4.3%
Used to calculate benefit obligations	3.2%	1.7%	3.2%

Our approach to determining expected return on plan asset assumptions evaluates both historical returns as well as estimates of future returns, and is adjusted for any expected changes in the long-term outlook for the equity and fixed income markets and for changes in the composition of pension plan assets. As a result, our estimate of the weighted average long-term rate of return on plan assets for all of our pension plans increased to 5.4% in 2019 from 5.2% in 2018.

Our pension plans generally do not require employee contributions. Our policy is to fund these pension plans in accordance with applicable domestic and international government regulations. At December 31, 2019, all legal funding requirements had been met.

The following table illustrates the sensitivity to a change in certain assumptions for our pension and postretirement benefit plan obligations. The changes in these assumptions have no effect on our funding requirements.

	Pension Benefits				Other Postretirement Benefits	
	U.S. Plans		Non-U.S. Plans			
	Change in 2020 pension expense	Change in PBO	Change in 2020 pension expense	Change in PBO	Change in 2020 pension expense	Change in PBO
25 basis point ("bp") decrease in discount rate	$ (1)	$ 33	$ 2	$ 41	$ —	$ 7
25 bp increase in discount rate	$ 2	$ (31)	$ (1)	$ (37)	$ —	$ (6)
25 bp decrease in return on assets rate	$ 2	n/a	$ 1	n/a	n/a	n/a
25 bp increase in return on assets rate	$ (2)	n/a	$ (1)	n/a	n/a	n/a

The assumed health care trend rate affects the amounts reported for our postretirement benefit plan obligations. The following table illustrates the sensitivity to a change in the assumed health care trend rate:

	Total service and interest cost	APBO
100 bp increase in health care cost trend rate	$ —	$ 21
100 bp decrease in health care cost trend rate	$ (1)	$ (18)

Refer to Note 13, Pension Plans, Postretirement and Other Employee Benefits, in our consolidated financial statements included in Item 8 for additional information regarding our pension and other postretirement employee benefit costs and assumptions.

Warranty Reserves

Where we have offered product warranty and also provide for warranty costs. Provisions for estimated expenses related to product warranty are made at the time products are sold or when specific warranty issues are identified on OE products. These estimates are established using historical information about the nature, frequency, and average cost of warranty claims and upon specific warranty issues as they arise. The warranty terms vary but range from one year up to limited lifetime warranties on some of our premium aftermarket products. While we have not experienced any material differences between these estimates and our actual costs, it is reasonably possible that future warranty issues could arise that could have a material effect on our consolidated financial statements.

Income Taxes

We recognize deferred tax assets and liabilities which reflect the temporary differences between the financial statement carrying value of assets and liabilities and the tax reporting values. Future tax benefits of net operating losses ("NOL") and tax credit carryforwards are also recognized as deferred tax assets on a taxing jurisdiction basis. We measure deferred tax assets and liabilities using enacted tax rates that will apply in the years in which we expect the temporary differences to be recovered or paid. Changes in tax laws or accounting standards and methods may affect recorded deferred taxes in future periods.

Valuation allowances are recorded to reduce our deferred tax assets to an amount that is more likely than not to be realized. The ability to realize deferred tax assets depends on our ability to generate sufficient taxable income within the carryforward periods provided for in the tax law for each tax jurisdiction. In the event our operating performance deteriorates, future assessments could conclude that a larger valuation allowance will be needed to further reduce the deferred tax assets. We do not believe there is a reasonable likelihood that there will be a material change in the tax related balances or valuation allowance balances. However, due to the complexity of some of these uncertainties, the ultimate resolution may be materially different from the current estimate. Refer to Note 14, Income Taxes, in our consolidated financial statements included in Item 8 for additional information.

In addition, the calculation of our tax benefits and liabilities includes uncertainties in the application of complex tax regulations in a multitude of jurisdictions across our global operations. We recognize tax benefits and liabilities based on our estimate of whether, and the extent to which, additional taxes will be due. We adjust these liabilities based on changing facts and circumstances; however, due to complexity of some of these uncertainties and the effect of any tax audits, the ultimate resolutions may be materially different from our estimated liabilities.

MARKET RISK SENSITIVITY

We are exposed to certain global market risks, including foreign currency exchange risk, commodity price risk, interest rate risk associated with our debt, and equity price risk associated with our share-based compensation awards.

Foreign Currency Exchange Rate Risk

We manufacture and sell our products in North America, South America, Asia, Europe, and Africa. As a result, our financial results could be significantly affected by factors such as changes in foreign currency exchange rates or weak economic conditions in foreign markets in which we manufacture and sell our products. We generally try to use natural hedges within our foreign currency activities, including the matching of revenues and costs, to minimize foreign currency risk. Where natural hedges are not in place, we consider managing certain aspects of our foreign currency activities and larger transactions through the use of foreign currency options or forward contracts. Principal currencies hedged have historically included the U.S. dollar, euro, British pound, Polish zloty, Singapore dollar, and Mexican peso.

Foreign Currency Forward Contracts — We enter into foreign currency forward purchase and sale contracts to mitigate our exposure to changes in exchange rates on certain intercompany and third-party trade receivables and payables. In managing our foreign currency exposures, we identify and aggregate existing offsetting positions and then hedge residual exposures through third-party derivative contracts. The gain or loss on these contracts is recorded as foreign currency gains (losses) within cost of sales in the consolidated statements of income (loss). The fair value of foreign currency forward contracts are recorded in prepayments and other current assets or accrued expenses and other current liabilities in the consolidated balance sheets. The fair value of the Company's foreign currency forward contracts was a net asset position of less than $1 million at December 31, 2019 and a net liability position of less than $1 million at December 31, 2018.

The following table summarizes by major currency the notional amounts for foreign currency forward purchase and sale contracts as of December 31, 2019 (all of which mature in 2020):

		Notional Amount in Foreign Currency
		(millions)
British pounds	—Purchase	4
	—Sell	(1)
Canadian dollars	—Sell	[illegible]
European euro	—Sell	(21)
Japanese yen	—Sell	(251)
Polish zloty	—Purchase	71
Singapore dollars	—Sell	(17)
South African rand	—Sell	(49)
Mexican pesos	—Purchase	14
U.S. dollars	—Purchase	20

A hypothetical 10% adverse change in the U.S. relative to all other currencies would not materially affect our consolidated financial position, results of operations or cash flows with regard to changes in the fair values of foreign currency forward contracts.

We are exposed to foreign currency risk due to translation of the results of certain international operations into U.S. dollars as part of the consolidation process. Fluctuations in foreign currency exchange rates can therefore create volatility in the results of operations and may adversely affect our financial condition.

The following table summarizes the amounts of foreign currency translation and transaction losses:

	Years Ended December 31	
	2019	2018
	(millions)	
Translation gains (losses) recorded in accumulated other comprehensive income (loss)	$ 16	$ (134)
Transaction gains (losses) recorded in earnings	$ (11)	$ 15

Senior Secured Notes — We have foreign currency denominated debt, €758 million of which was designated as a net investment hedge in certain foreign subsidiaries and affiliates of ours. As such, an adverse change in foreign currency exchange rates will have no effect on earnings. For the portion not designated as a net investment hedge, we have other natural hedges in place that will offset any adverse change in foreign currency exchange rates.

A hypothetical 10% adverse change in foreign exchange rates between the euro and U.S. dollar would increase the amount of cash required to settle these notes by approximately $142 million as of December 31, 2019.

Commodity Price Risk
Commodity rate price forward contracts are executed to offset a portion of our exposure to the potential change in prices for raw materials including copper, nickel, tin, zinc, and aluminum. The fair value of our commodity price forward contracts was a net asset position of less than $1 million on an equivalent notional amount of $19 million as of December 31, 2019. A hypothetical 10% adverse change in commodity prices would not materially affect our consolidated financial position, results of operations or cash flows with regard to changes in the fair values of commodity forward contracts.

Interest Rate Risk
Our financial instruments that are sensitive to market risk for changes in interest rates are primarily our debt securities. We use our revolving credit facilities to finance our short-term and long-term capital requirements. We pay a current market rate of interest on these borrowings. Our long-term capital requirements have been financed with long-term debt with original maturity dates ranging from four to ten years. On December 31, 2019, we had $1.6 billion par value of fixed rate debt and $3.6 billion par value of floating rate debt. Of the fixed rate debt, $479 million is fixed through 2022, $636 million is fixed through 2024, and $494 million is fixed through 2026. For more detailed explanations on our debt structure and senior credit facility refer to "Liquidity and Capital Resources — Capitalization" earlier in this Management's Discussion and Analysis.

We estimate the fair value of our long-term debt at December 31, 2019 was about 99% of its book value. A hypothetical one percentage point increase or decrease in interest rates would increase or decrease the annual interest expense we recognize in the income statement and the cash we pay for interest expense by about $40 million.

Equity Price Risk
We also utilize an equity swap arrangement to offset changes in liabilities related to the equity market risks of our arrangements for deferred compensation and restricted stock unit awards. Gains or losses from changes in the fair value of these equity swaps are generally offset by the losses or gains on the related liabilities. We selectively use cash-settled equity swaps to reduce market risk associated with our deferred compensation liabilities. These equity compensation liabilities increase as our stock price increases and decrease as our stock price decreases. In contrast, the value of the swap agreement moves in the opposite direction of these liabilities, allowing us to fix a portion of the liabilities at a certain amount. As of December 31, 2019, the Company hedged its deferred compensation liability related to approximately 600,000 common share equivalents, an increase from 250,000 common share equivalents as of December 31, 2018. The fair value of the Company's equity swap agreement was a net asset position of $1 million at December 31, 2019. A hypothetical 10% adverse change in share prices would not materially affect our consolidated financial position, results of operations or cash flows with regard to the equity swaps as an offsetting change would be applied to the related deferred compensation liability.

ENVIRONMENTAL MATTERS, LEGAL PROCEEDINGS AND PRODUCT WARRANTIES

Note 15—Commitments and Contingencies of the consolidated financial statements included in Item 8 — "Financial Statements and Supplemental Data" is incorporated herein by reference.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Information required by Item 7A is included in Note 2, Summary of Significant Accounting Policies; Note 9, Derivatives and Hedging Activities; and Note 10, Fair value of Financial Instruments of the consolidated financial statements and notes included in Item 8. Other information required by Item 7A is included in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Item 7.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA.

INDEX TO FINANCIAL STATEMENTS OF TENNECO INC. AND CONSOLIDATED SUBSIDIARIES

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management of Tenneco Inc. is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) and Rule 15d-15(f) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")). Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2019. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in *Internal Control-Integrated Framework* (2013). Based on this assessment, management concluded that the Company's internal control over financial reporting was not effective as of December 31, 2019 because of the material weakness described below.

A material weakness (as defined in Rule 12b-2 under the Exchange Act) is a deficiency, or combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement in our annual or interim financial statements will not be prevented or detected on a timely basis.

During 2019, the continued integration of the Federal-Mogul acquisition increased the complexity and level of certain financial reporting activities within the North America Motorparts business, without a corresponding change in centralized resource levels. As a result, the Company identified a deficiency within its North America Motorparts business that constitutes a material weakness, as it did not maintain a sufficient complement of resources in the North America Motorparts business to ensure that appropriate controls were designed, maintained and executed, including controls over account reconciliations and manual journal entries, related to the integration of a previously acquired entity within the North America Motorparts business. This material weakness did not result in any material misstatements of the Company's financial statements or disclosures, but did result in out-of-period adjustments to decrease inventory and increase cost of sales during the quarter ended December 31, 2019. Additionally, this material weakness could result in the misstatement of the relevant account balances or disclosures that would result in a material misstatement to the annual or interim consolidated financial statements that would not be prevented or detected.

The effectiveness of our internal control over financial reporting as of December 31, 2019 has been audited by PricewaterhouseCoopers LLP, our independent registered public accounting firm, as stated in their report, which is included herein.

March 2, 2020

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of Tenneco Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Tenneco Inc. and its subsidiaries (the "Company") as of December 31, 2019 and 2018, and the related consolidated statements of income (loss), of comprehensive income (loss), of changes in shareholders' equity and of cash flows for each of the three years in the period ended December 31, 2019, including the related notes and financial statement schedule listed in the index appearing under Item 15 (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company did not maintain, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO because a material weakness in internal control over financial reporting existed as of that date related to an insufficient complement of resources in the Company's North America Motorparts business to ensure that appropriate controls were designed, maintained and executed, including controls over account reconciliations and manual journal entries, related to the integration of a previously acquired entity within that business.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the annual or interim financial statements will not be prevented or detected on a timely basis. The material weakness referred to above is described in the accompanying Management's Report on Internal Control over Financial Reporting. We considered this material weakness in determining the nature, timing, and extent of audit tests applied in our audit of the 2019 consolidated financial statements, and our opinion regarding the effectiveness of the Company's internal control over financial reporting does not affect our opinion on those consolidated financial statements.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in management's report referred to above. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting
A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters
The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Goodwill Impairment Assessment
As described in Notes 2 and 7 to the consolidated financial statements, the Company's consolidated goodwill balance was $775 million as of December 31, 2019. Management evaluates goodwill for impairment annually during the fourth quarter, or more frequently if events or circumstances indicate that goodwill might be impaired. An impairment indicator exists when a reporting unit's carrying value exceeds its fair value. Fair value of a reporting unit is estimated using a combination of the income approach and market approach. Assumptions used in the income approach that have the most significant effect on the estimated fair value of the Company's reporting units are the discount rate, the revenue growth rate and projected operating margins.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment is a critical audit matter are there was significant judgment by management when developing the fair value measurement of the reporting units. This in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures to evaluate significant assumptions, including the discount rate, the revenue growth rate and projected operating margins. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained from these procedures.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment assessment, including controls over the valuation of the Company's reporting units. These procedures also included, among others, testing management's process for developing the fair value measurements; evaluating the appropriateness of the income approach and market approach methods; testing the completeness, accuracy, and relevance of underlying data used in developing the fair value measurements; and evaluating the reasonableness of significant assumptions used by management, including the discount rate, the revenue growth rate and projected operating margins. Evaluating the reasonableness of management's significant assumptions related to the revenue growth rate and projected operating margins involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the reporting units, (ii) the consistency with external market and industry data, and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's income approach and market approach methods, including certain significant assumptions.

Indefinite-lived Intangible Asset Impairment Assessment
As described in Notes 2 and 7 to the consolidated financial statements, the Company's consolidated indefinite-lived intangible asset balance was $282 million as of December 31, 2019. Indefinite-lived intangible assets include trade names and trademarks. Management conducts an impairment analysis annually during the fourth quarter, or more frequently if events or circumstances indicate that the assets might be impaired. An impairment exists when the trade names and trademarks' carrying

value exceeds its fair value. The fair values of these assets are based upon the prospective stream of hypothetical after-tax royalty cost savings discounted at rates that reflect the rates of return appropriate for these intangible assets. Assumptions used in the impairment assessment of the trade names and trademarks that have the most significant effect on the estimated fair value are projected branded product sales, the revenue growth rate, the royalty rate and the discount rate.

The principal considerations for our determination that performing procedures relating to the indefinite-lived intangible asset impairment assessment is a critical audit matter are there was significant judgment by management when developing the fair value measurement of the trade names and trademarks. This in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures to evaluate management's significant assumptions, including projected branded product sales, the revenue growth rate, the royalty rate and the discount rate. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained from these procedures.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's indefinite-lived intangible asset impairment assessment, including controls over the valuation of the Company's trade names and trademarks. These procedures also included, among others, testing management's process for developing the fair value measurements; evaluating the appropriateness of the valuation model; testing the completeness, accuracy, and relevance of underlying data used in the model; and evaluating the reasonableness of significant assumptions used by management, including projected branded product sales, the revenue growth rate, the royalty rate and the discount rate. Evaluating the reasonableness of management's assumptions related to projected branded product sales and the revenue growth rate involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of branded products, (ii) the consistency with external market and industry data, and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's valuation model, including certain significant assumptions.

/s/ PricewaterhouseCoopers LLP
Milwaukee, Wisconsin
March 2, 2020

We have served as the Company's auditor since 2010.

TENNECO INC.
CONSOLIDATED STATEMENTS OF INCOME (LOSS)

	Year Ended December 31		
	2019	2018	2017
	(Millions Except Share and Per Share Amounts)		
Revenues			
Net sales and operating revenues	$ 17,450	$ 11,763	$ 9,274
Costs and expenses			
Cost of sales (exclusive of depreciation and amortization)	14,912	10,002	7,771
Selling, general, and administrative	1,138	752	632
Depreciation and amortization	673	345	226
Engineering, research, and development	324	200	158
Restructuring charges and asset impairments	126	117	47
Goodwill and intangible impairment charges	241	3	11
	17,414	11,419	8,845
Other income (expense)			
Non-service pension and postretirement benefit (costs) credits	(11)	(20)	(16)
Equity in earnings (losses) of nonconsolidated affiliates, net of tax	43	18	(1)
Loss on extinguishment of debt	—	(10)	(1)
Other income (expense), net	53	(10)	2
	85	(22)	(16)
Earnings (loss) before interest expense, income taxes, and noncontrolling interests	121	322	413
Interest expense	(322)	(148)	(77)
Earnings (loss) before income taxes and noncontrolling interests	(201)	174	336
Income tax (expense) benefit	(19)	(63)	(71)
Net income (loss)	(220)	111	265
Less: Net income attributable to noncontrolling interests	114	56	67
Net income (loss) attributable to Tenneco Inc.	$ (334)	$ 55	$ 198
Earnings (loss) per share			
Basic earnings (loss) per share:			
Earnings (loss) per share	$ (4.12)	$ 0.93	$ 3.75
Weighted average shares outstanding	80,904,060	58,625,087	52,796,184
Diluted earnings (loss) per share:			
Earnings (loss) per share	$ (4.12)	$ 0.93	$ 3.73
Weighted average shares outstanding	80,904,060	58,758,732	53,026,911

The accompanying notes to the consolidated financial statements are an integral part of these consolidated statements of income (loss).

TENNECO INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

	Year Ended December 31		
	2019	2018	2017
		(Millions)	
Net income (loss)	$ (220)	$ 111	$ 265
Other comprehensive income (loss)—net of tax			
Foreign currency translation adjustments	16	(134)	106
Defined benefit plans	(45)	(22)	17
	(29)	(156)	123
Comprehensive income (loss)	(249)	(45)	388
Less: Comprehensive income (loss) attributable to noncontrolling interests	104	54	69
Comprehensive income (loss) attributable to common shareholders	$ (353)	$ (99)	$ 319

The accompanying notes to the consolidated financial statements are an integral part of these consolidated statements of comprehensive income (loss).

TENNECO INC.
CONSOLIDATED BALANCE SHEETS

	December 31	
	2019	2018
	(Millions, except shares)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 564	$ 697
Restricted cash	2	5
Receivables		
Customer notes and accounts, net	2,438	2,487
Other	100	85
Inventories	1,999	2,245
Prepayments and other current assets	632	590
Total current assets	5,735	6,109
Property, plant and equipment, net	3,627	3,501
Long-term receivables, net	10	10
Goodwill	775	869
Intangibles, net	1,422	1,519
Investments in nonconsolidated affiliates	518	544
Deferred income taxes	607	467
Other assets	532	213
Total assets	$ 13,226	$ 13,232
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Short-term debt, including current maturities of long-term debt	$ 185	$ 153
Accounts payable	2,647	2,759
Accrued compensation and employee benefits	325	343
Accrued income taxes	72	64
Accrued expenses and other current liabilities	1,070	1,001
Total current liabilities	4,299	4,320
Long-term debt	5,371	5,340
Deferred income taxes	106	88
Pension and postretirement benefits	1,145	1,167
Deferred credits and other liabilities	490	263
Commitments and contingencies (Note 15)		
Total liabilities	11,411	11,178
Redeemable noncontrolling interests	196	138
Tenneco Inc. shareholders' equity:		
Preferred stock—$0.01 par value; none issued	—	—
Class A voting common stock—$0.01 par value; shares issued: (2019—71,727,061; 2018—71,675,379)	1	1
Class B non-voting convertible common stock—$0.01 par value; shares issued: 2019 and 2018—23,793,669	—	—
Additional paid-in capital	4,432	4,360
Accumulated other comprehensive loss	(711)	(692)
Accumulated deficit	(1,367)	(1,013)
	2,355	2,656
Shares held as treasury stock—at cost: 2019 and 2018—14,592,888 shares	(930)	(930)
Total Tenneco Inc. shareholders' equity	1,425	1,726
Noncontrolling interests	194	190
Total equity	1,619	1,916
Total liabilities, redeemable noncontrolling interests, and equity	$ 13,226	$ 13,232

The accompanying notes to the consolidated financial statements are an integral part of these consolidated balance sheets.

TENNECO INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31		
	2019	2018	2017
	(Millions)		
Operating Activities			
Net income (loss)	$ (220)	$ 111	$ 265
Adjustments to reconcile net income (loss) to cash provided (used) by operating activities:			
Goodwill and intangible impairment charge	241	3	11
Depreciation and amortization	673	345	226
Deferred income taxes	(151)	(65)	(8)
Stock-based compensation	25	14	14
Restructuring charges and asset impairments, net of cash paid	11	49	8
Change in pension and postretirement benefit plans	(57)	(8)	(15)
Equity in earnings of nonconsolidated affiliates	(43)	(18)	1
Cash dividends received from nonconsolidated affiliates	53	2	—
Changes in operating assets and liabilities:			
Receivables	(225)	(174)	(76)
Inventories	284	27	(94)
Payables and accrued expenses	(66)	291	136
Accrued interest and income taxes	3	(19)	1
Other assets and liabilities	(84)	(119)	48
Net cash provided (used) by operating activities	444	439	517
Investing Activities			
Acquisitions, net of cash acquired	(158)	(2,194)	—
Proceeds from sale of assets	20	9	8
Net proceeds from sale of business	22	—	—
Proceeds from sale of investment in nonconsolidated affiliates	2	—	9
Cash payments for plant, property, and equipment	(744)	(507)	(419)
Proceeds from deferred purchase price of factored receivables	250	174	112
Other	2	4	(10)
Net cash provided (used) by investing activities	(606)	(2,514)	(300)
Financing Activities			
Proceeds from term loans and notes	200	3,426	160
Repayments of term loans and notes	(341)	(453)	(36)
Borrowings on revolving lines of credit	9,120	5,149	6,664
Payments on revolving lines of credit	(8,884)	(5,405)	(6,737)
Repurchase of common shares	(2)	(1)	(1)
Cash dividends	(20)	(59)	(53)
Debt issuance cost of long-term debt	—	(95)	(8)
Purchase of common stock under the share repurchase program	—	—	(169)
Net decrease in bank overdrafts	(13)	(5)	(7)
Acquisition of additional ownership interest in consolidated affiliates	(10)	—	—
Distributions to noncontrolling interest partners	(43)	(51)	(64)
Other	(4)	(30)	—
Net cash provided (used) by financing activities	3	2,476	(251)
Effect of foreign exchange rate changes on cash, cash equivalents, and restricted cash	23	(17)	3
Increase (decrease) in cash, cash equivalents, and restricted cash	(136)	384	(31)
Cash, cash equivalents, and restricted cash, beginning of period	702	318	349
Cash, cash equivalents, and restricted cash, end of period	$ 566	$ 702	$ 318
Supplemental Cash Flow Information			
Cash paid during the year for interest	$ 284	$ 143	$ 78
Cash paid during the year for income taxes, net of refunds	$ 177	$ 113	$ 95
Non-cash Investing and Financing Activities			

Period end balance of trade payables for plant, property, and equipment	$	134	$	135	$	59
Deferred purchase price of receivables factored in the period in investing	$	253	$	154	$	114
Stock issued for acquisition of Federal-Mogul	$	—	$	(1,236)	$	—
Stock transferred for acquisition of Federal-Mogul	$	—	$	1,236	$	—
Redeemable noncontrolling interest transaction with owner	$	53	$	—	$	—

The accompanying notes to the consolidated financial statements are an integral part of these consolidated statements of cash flows.

TENNECO INC.
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY

	Tenneco Inc. Shareholders' equity							
	$0.01 Par Value Common Stock	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Treasury Stock	Total Tenneco Inc. Shareholders' Equity	Noncontrolling Interests	Total Equity
				(Millions)				
Balance as of December 31, 2016	$ 1	$ 3,098	$ (659)	$ (1,154)	$ (761)	$ 525	$ 47	$ 572
Net income (loss)	—	—	—	198	—	198	31	229
Other comprehensive income (loss)— net of tax:								
Foreign currency translation adjustments	—	—	104	—	—	104	(1)	103
Defined benefit plans	—	—	17	—	—	17	—	17
Comprehensive income (loss)						319	30	349
Stock-based compensation, net	—	14	—	—	—	14	—	14
Cash dividends ($1.00 per share)	—	—	—	(53)	—	(53)	—	(53)
Purchases of treasury stock	—	—	—	—	(169)	(169)	—	(169)
Distributions declared to noncontrolling interests	—	—	—	—	—	—	(31)	(31)
Balance as of December 31, 2017	1	3,112	(538)	(1,009)	(930)	636	46	682
Net income (loss)	—	—	—	55	—	55	27	82
Other comprehensive income (loss)— net of tax:								
Foreign currency translation adjustments	—	—	(132)	—	—	(132)	—	(132)
Defined benefit plans	—	—	(22)	—	—	(22)	—	(22)
Comprehensive income (loss)						(99)	27	(72)
Adjustments to adopt new accounting standards(a)	—	—	—	—	—	—	—	—
Common stock issued	—	1,236	—	—	—	1,236	—	1,236
Acquisitions	—	—	—	—	—	—	143	143
Stock-based compensation, net	—	12	—	—	—	12	—	12
Cash dividends ($1.00 per share)	—	—	—	(59)	—	(59)	—	(59)
Distributions declared to noncontrolling interests	—	—	—	—	—	—	(26)	(26)
Balance as of December 31, 2018	1	4,360	(692)	(1,013)	(930)	1,726	190	1,916
Net income (loss)	—	—	—	(334)	—	(334)	29	(305)
Other comprehensive income (loss)— net of tax:								
Foreign currency translation adjustments	—	—	26	—	—	26	—	26
Defined benefit plans	—	—	(45)	—	—	(45)	—	(45)
Comprehensive income (loss)						(353)	29	(324)
Acquisition of additional ownership interest in consolidated affiliates	—	(4)	—	—	—	(4)	(6)	(10)
Stock-based compensation, net	—	23	—	—	—	23	—	23
Purchase accounting measurement period adjustment	—	—	—	—	—	—	(2)	(2)
Cash dividends ($0.25 per share)	—	—	—	(20)	—	(20)	—	(20)
Distributions declared to noncontrolling interests	—	—	—	—	—	—	(17)	(17)
Redeemable noncontrolling interest transaction with owner	—	53	—	—	—	53	—	53
Balance as of December 31, 2019	$ 1	$ 4,432	$ (711)	$ (1,367)	$ (930)	$ 1,425	$ 194	$ 1,619

(a) The cumulative effect of the adoption of ASU 2016-16 was an increase to accumulated deficit of $1 million, and the cumulative effect of the adoption of ASC 606 was a decrease to accumulated deficit of $1 million.

The accompanying notes to the consolidated financial statements are an integral part of these statements of changes in shareholders' equity.

TENNECO INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except share and per share amounts, or as otherwise noted)

1. Description of Business

Tenneco Inc. ("Tenneco" or "the Company") was formed under the laws of Delaware in 1996. Tenneco designs, manufactures, markets, and sells products and services for light vehicle, commercial truck, off-highway, industrial, and aftermarket customers. The Company is one of the world's leading manufacturers of innovative clean air, powertrain, and ride performance products and systems, and serves both original equipment manufacturers ("OEM") and replacement markets worldwide.

On January 10, 2019, the Company completed the acquisition of a 90.5% ownership interest in Öhlins Intressenter AB ("Öhlins", the "Öhlins Acquisition"), a Swedish technology company that develops premium suspension systems and components for the automotive and motorsport industries.

Effective October 1, 2018, the Company completed the acquisition of Federal-Mogul LLC ("Federal-Mogul") (the "Federal-Mogul Acquisition", and together with the Öhlins Acquisition, the "Acquisitions"), a global supplier of technology and innovation in vehicle and industrial products for fuel economy, emissions reductions, and safety systems. Federal-Mogul serves the world's foremost OEM and servicers ("OES", and together with OEM, "OE") of automotive, light, medium and heavy-duty commercial vehicles, off road, agricultural, marine, rail, aerospace, and power generation and industrial equipment, as well as the worldwide aftermarket. Following the closing of the Federal-Mogul Acquisition, the Company agreed to use its reasonable best efforts to pursue the separation of the combined company to form two new, independent, publicly traded companies, a new Powertrain Technology company ("New Tenneco") and an Aftermarket and Ride Performance company ("DRiV").

2. Summary of Significant Accounting Policies

Basis of Presentation
The consolidated financial statements of the Company have been prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP").

Reclassifications: Certain amounts in the prior years have been aggregated or disaggregated to conform to current year presentation. These reclassifications included reclassifying amounts related to restructuring and asset impairments from cost of sales (exclusive of depreciation and amortization); selling, general, and administrative expenses; engineering, research, and development; and other income (expense) into a separate financial statement line item within the statements of income (loss). In addition, loss on sale of receivables was reclassified from other income (expense) to interest expense. These reclassifications affected the three and twelve months ended December 31, 2018 and 2017 and have no effect on previously reported net income, other comprehensive income (loss), and the cash provided (used) by operating, investing or financing activities within the consolidated statements of cash flows. In addition, the Company recorded immaterial charges of $7 million in its Motorparts segment in the three months ended June 30, 2019 and $5 million in its Ride Performance segment in the three months ended September 30, 2019, both related to prior periods.

Summary of Significant Accounting Policies
Principles of Consolidation: The Company consolidates into its financial statements the accounts of the Company, all wholly owned subsidiaries, and any partially owned subsidiary it has the ability to control. Control generally equates to ownership percentage, whereby investments more than 50% owned are consolidated, investments in affiliates of 50% or less but greater than 20% are accounted for using the equity method, and investments in affiliates of 20% or less are accounted for using the cost method. See Note 8, Investment in Nonconsolidated Affiliates.

The Company does not consolidate any entity for which it has a variable interest based solely on the power to direct the activities and significant participation in the entity's expected results that would not otherwise be consolidated based on control through voting interests. Further, its affiliates are businesses established and maintained in connection with its operating strategy and are not special purpose entities. All intercompany transactions and balances have been eliminated.

Use of Estimates: The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the amounts reported therein. Due to the inherent uncertainty involved in making estimates, actual results reported in future periods may be based upon amounts that differ from these estimates.

Cash and Cash Equivalents: The Company considers all highly liquid investments with maturities of 90 days or less from the date of purchase to be cash equivalents. The carrying value of cash and cash equivalents approximate fair value.

Restricted Cash: The Company is required to provide cash collateral in connection with certain contractual arrangements and statutory requirements. The Company has $2 million and $5 million of restricted cash at December 31, 2019 and 2018 in support of these arrangements and requirements.

Notes and Accounts Receivable: Notes and accounts receivable are stated at net realizable value, which approximates fair value. Receivables are reduced by an allowance for amounts that may become uncollectible in the future. The allowance is an estimate based on expected losses, current economic and market conditions, and a review of the current status of each customer's trade accounts or notes receivable. A receivable is past due if payments have not been received within the agreed-upon invoice terms. Account balances are charged-off against the allowance when management determines the receivable will not be recovered.

The allowance for doubtful accounts on short-term and long-term accounts receivable was $28 million and $17 million at December 31, 2019 and 2018. The allowance for doubtful accounts on short-term and long-term notes receivable was zero at both December 31, 2019 and 2018.

Inventories: Inventories are stated at the lower of cost or net realizable value using the first-in, first-out ("FIFO") or average cost methods. Work in process includes purchased parts such as substrates coated with precious metals. Cost of inventory includes direct materials, labor, and applicable manufacturing overhead costs. The value of inventories is reduced for excess and obsolescence based on management's review of on-hand inventories compared to historical and estimated future sales and usage.

Redeemable Noncontrolling Interests: The Company has noncontrolling interests with redemption features. These redemption features could require the Company to make an offer to purchase the noncontrolling interests in the event of a change in control of Tenneco Inc. or certain of its subsidiaries.

At December 31, 2019, the Company holds redeemable noncontrolling interests of $44 million which are not currently redeemable, or probable of becoming redeemable. The redemption of these noncontrolling interests is not solely within the Company's control, therefore, they are presented in the temporary equity section of the Company's consolidated balance sheets. The Company does not believe it is probable the redemption features related to these noncontrolling interest securities will be triggered, as a change in control event is generally not probable until it occurs. As such, these noncontrolling interests have not been remeasured to redemption value.

In addition, at December 31, 2019, the Company holds redeemable noncontrolling interests of $152 million which are currently redeemable, or probable of becoming redeemable. These noncontrolling interests are also presented in the temporary equity section of the Company's consolidated balance sheets and have been remeasured to redemption value. The Company immediately recognizes changes to redemption value as a component of noncontrolling interest income (loss) in the consolidated statements of income (loss). These redeemable noncontrolling interests include the following:

- A 9.5% ownership interest in Öhlins Intressenter AB (the "KÖ Interest") was retained by K Öhlin Holding AB ("Köhlin"), as a result of the Öhlins Acquisition on January 10, 2019. Köhlin has an irrevocable right at any time after the third anniversary of the Öhlins Acquisition to sell the KÖ Interest to the Company. Since it is probable the KÖ Interest will become redeemable, the Company recognized the change in carrying value and recorded an adjustment of $5 million to reflect its redemption value of $21 million as of December 31, 2019; and
- A redeemable noncontrolling interests for a subsidiary in India acquired by the Company as part of the Federal-Mogul Acquisition on October 1, 2018. In accordance with local regulations, the Company initiated the process to make a tender offer of the shares it does not own due to the change in control triggered by the Federal-Mogul Acquisition. As of December 31, 2019, the related shares are currently redeemable and the tender offer price to redeem the shares exceeded the carrying value. The Company recognized the change in the carrying value and recorded an adjustment of $53 million to reflect its redemption value of $131 million as of December 31, 2019. See Note 22, Related Party Transactions, for additional information related to the tender offer of this redeemable noncontrolling interest.

The following is a rollforward of the activity in the redeemable noncontrolling interests for the years ended December 31, 2019, 2018 and 2017:

	December 31		
	2019	2018	2017
Balance at beginning of period	$ 138	$ 42	$ 40
Net income attributable to redeemable noncontrolling interests	27	29	36
Other comprehensive (loss) income	(10)	(2)	3
Acquisition and other	17	96	—
Purchase accounting measurement period adjustments	(8)	—	—
Contributions received	—	6	—
Redemption value remeasurement adjustments	58	—	—
Distributions to noncontrolling interests	(26)	(33)	(37)
Balance at end of period	$ 196	$ 138	$ 42

Long-Lived Assets: Long-lived assets, such as property, plant, and equipment and definite-lived intangible assets are recorded at cost or fair value established at acquisition. Definite-lived intangible assets include customer relationships and platforms, patented and unpatented technology, and licensing agreements. Long-lived asset groups are evaluated for impairment when impairment indicators exist. If the carrying value of a long-lived asset group is impaired, an impairment charge is recorded for the amount by which the carrying value of the long-lived asset group exceeds its fair value. Depreciation and amortization are computed principally on a straight-line basis over the estimated useful lives of the assets for financial reporting purposes. Expenditures for maintenance and repairs are expensed as incurred.

Goodwill, net: Goodwill is determined as the excess of fair value over amounts attributable to specific tangible and intangible assets. Goodwill is evaluated for impairment during the fourth quarter of each year, or more frequently, if impairment indicators exist. An impairment indicator exists when a reporting unit's carrying value exceeds its fair value. When performing the goodwill impairment testing, a reporting units' fair value is based on valuation techniques using the best available information. The assessment of fair value utilizes a combination of the income approach and market approach. The impairment charge is the excess of the goodwill carrying value over the implied fair value of goodwill using a one-step quantitative approach.

Trade Names and Trademarks: Trade names and trademarks are stated at fair value established at acquisition or cost. These indefinite-lived intangible assets are evaluated for impairment during the fourth quarter of each year, or more frequently, if impairment indicators exist. An impairment exists when a trade name and trademarks' carrying value exceeds its fair value. The fair values of these assets are based upon the prospective stream of hypothetical after-tax royalty cost savings discounted at rates that reflect the rates of return appropriate for these intangible assets. The impairment charge is the excess of the assets carrying value over its fair value.

Pre-production Design and Development and Tooling Assets: The Company expenses pre-production design and development costs as incurred unless there is a contractual guarantee for reimbursement from the original equipment ("OE") customer. Costs for molds, dies, and other tools used to make products sold on long-term supply arrangements for which the Company has title to the assets are capitalized in property, plant, and equipment and amortized to cost of sales over the shorter of the term of the arrangement or over the estimated useful lives of the assets. Costs for molds, dies, and other tools used to make products sold on long-term supply arrangements for which the Company has a contractual guarantee for reimbursement or has the non-cancelable right to use the assets during the term of the supply arrangement from the customer are capitalized in prepayments and other current assets.

Prepayments and other current assets included $162 million and $193 million at December 31, 2019 and 2018 for in-process tools and dies being built for OE customers and unbilled pre-production design and development costs.

Internal Use Software Assets: Certain costs related to the purchase and development of software used in the business operations are capitalized. Costs attributable to these software systems are amortized over their estimated useful lives based on various factors such as the effects of obsolescence, technology, and other economic factors. Additions to capitalized software development costs, including payroll and payroll-related costs for those employees directly associated with developing and obtaining the internal use software, are classified as investing activities in the consolidated statements of cash flows.

Income Taxes: Deferred tax assets and liabilities are recognized on the basis of the future tax consequences attributable to temporary differences that exist between the financial statement carrying value of assets and liabilities and the respective tax values, and net operating losses ("NOL") and tax credit carryforwards on a taxing jurisdiction basis. Deferred tax assets and liabilities are measured using enacted tax rates that will apply in the years in which the temporary differences are expected to be recovered or paid. The effect on deferred tax assets and liabilities of a change in tax rates is recorded in the results of operations in the period that includes the enactment date under the law.

Deferred income tax assets are evaluated quarterly to determine if valuation allowances are required or should be adjusted. Valuation allowances are established in certain jurisdictions based on a more likely than not standard. The ability to realize deferred tax assets depends on the Company's ability to generate sufficient taxable income within the carryback or carryforward periods provided for in the tax law for each tax jurisdiction. The Company considers the various possible sources of taxable income when assessing the realization of its deferred tax assets. The valuation allowances recorded against deferred tax assets generated by taxable losses in certain jurisdictions will affect the provision for income taxes until the valuation allowances are released. The Company's provision for income taxes will include no tax benefit for losses incurred and no tax expense with respect to income generated in these jurisdictions until the respective valuation allowance is eliminated.

The Company records uncertain tax positions on the basis of a two-step process whereby it is determined whether it is more likely than not that the tax positions will be sustained based on the technical merits of the position, and for those tax positions that meet the more likely than not criteria, the largest amount of tax benefit that is greater than 50% likely to be realized upon ultimate settlement with the related tax authority is recognized.

The Company elected to account for Global Intangible Low-Taxed Income ("GILTI") as a current-period expense when incurred.

Pension and Other Postretirement Benefit Plan Obligations: Pensions and other postretirement employee benefit costs and related liabilities and assets are dependent upon assumptions used in calculating such amounts. These assumptions include discount rates, long term rate of return on plan assets, health care cost trends, compensation, and other factors. Actual results that differ from the assumptions used are accumulated and amortized over future periods, and accordingly, generally affect recognized expense in future periods. The cost of benefits provided by defined benefit pension and other postretirement plans is recorded in the period employees provide service. Future pension expense for certain significant funded benefit plans is calculated using an expected return on plan asset methodology.

Investments with registered investment companies, common and preferred stocks, and certain government debt securities are valued at the closing price reported on the active market on which the securities are traded. Corporate debt securities are valued by third-party pricing sources using the multi-dimensional relational model using instruments with similar characteristics. Hedge funds and the collective trusts are valued at net asset value ("NAV") per share which are provided by the respective investment sponsors or investment advisers.

Revenue Recognition: The Company accounts for a contract with a customer when it has approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance, and collectability of consideration is probable.

Revenue is recognized for sales to OE and aftermarket customers when transfer of control of the related good or service has occurred. Revenue from most OE and aftermarket goods and services is transferred to customers at a point in time. The customer is invoiced once transfer of control has occurred and the Company has a right to payment. Typical payment terms vary based on the customer and the type of goods and services in the contract. The period of time between invoicing and when payment is due is not significant. Amounts billed and due from customers are classified as accounts receivable in the consolidated balance sheets. Standard payment terms are less than one year and the Company applies the practical expedient to not assess whether a contract has a significant financing component if the payment terms are less than one year.

Performance Obligations: The majority of the Company's customer contracts with OE and aftermarket customers are long-term supply arrangements. The performance obligations are established by the enforceable contract, which is generally considered to be the purchase order but, in some cases could be the delivery release schedule. The purchase order, or related delivery release schedule, is of a duration of less than one year. As such, the Company does not disclose information about remaining performance obligations that have original expected durations of one year or less, for which work has not yet been performed.

Rebates: The Company accrues for rebates pursuant to specific arrangements primarily with aftermarket customers. Rebates generally provide for payments to customers based upon the achievement of specified purchase volumes and are recorded as a reduction of sales as earned by such customers.

Product Returns: Certain aftermarket contracts with customers include terms and conditions that result in a customer right of return that is accounted for on a gross basis. For these contracts the Company has recorded a refund liability within other accrued liabilities and a return asset within other current assets in the consolidated balance sheets.

Shipping and Handling Costs: Shipping and handling costs associated with outbound freight after control of a product has transferred to a customer are accounted for as a fulfillment cost and are included in cost of sales in the consolidated statements of income (loss).

Sales and Sales Related Taxes: The Company collects and remits taxes assessed by various governmental authorities that are both imposed on and concurrent with revenue-producing transactions with its customers. These taxes may include, but are not limited to, sales, use, value-added, and some excise taxes. The collection and remittance of these taxes is reported on a net basis.

Contract Balances: Contract assets primarily relate to the Company's rights to consideration for work completed but not billed at the reporting date on contracts with customers. The contract assets are transferred to accounts receivable when the rights become unconditional. Contract liabilities primarily relate to contracts where advance payments or deposits have been received, but performance obligations have not yet been met, and therefore, revenue has not been recognized. There have been no impairment losses recognized related to any accounts receivable or contract assets arising from the Company's contracts with customers.

Engineering, Research, and Development: The Company records engineering, research, and development costs ("R&D") net of customer reimbursements as they are considered a recovery of cost.

Advertising and Promotion Expenses: The Company expenses advertising and promotional expenses as incurred and these expenses were $45 million, $36 million, and $40 million for the years ended December 31, 2019, 2018, and 2017.

Other Income (Expense): Other income (expense) primarily includes a $22 million recovery of value-added tax in a foreign jurisdiction.

Foreign Currency Translation: Exchange adjustments related to foreign currency transactions and remeasurement adjustments for foreign subsidiaries whose functional currency is the U.S. dollar are reflected in the consolidated statements of income (loss). Translation adjustments of foreign subsidiaries for which local currency is the functional currency are reflected in the consolidated balance sheets as a component of accumulated other comprehensive income (loss). Transaction gains and losses arising from fluctuations in currency exchange rates on transactions denominated in currencies other than the functional currency are recognized in earnings as incurred, except for those intercompany balances for which settlement is not planned or anticipated in the foreseeable future. The amounts recorded in cost of sales in the consolidated statements of income (loss) for foreign currency transactions included $11 million of losses, $15 million of gains, and $4 million of losses for the years ended December 31, 2019, 2018, and 2017.

Asset Retirement Obligations: The Company records asset retirement obligations ("ARO") when liabilities are probable and amounts can be reasonably estimated. The Company's primary ARO activities relate to the removal of hazardous building materials at its facilities.

Derivative Financial Instruments: For derivative instruments to qualify as hedging instruments, they must be designated as a fair value hedge, cash flow hedge or a hedge of a net investment in a foreign operation. Gains and losses related to a hedge are either recognized in income immediately to offset the gain or loss on the hedged item or are deferred and reported as a component of accumulated other comprehensive income (loss) and subsequently recognized in earnings when the hedged item affects earnings. The change in fair value of the ineffective portion of a derivative financial instrument, determined using the hypothetical derivative method, is recognized in earnings immediately. The gain or loss related to derivative financial instruments not designated as hedges are recognized immediately in earnings. Cash flows related to hedging activities are included in the operating section of the consolidated statements of cash flows.

New Accounting Pronouncements

Adoption of New Accounting Standards

Comprehensive Income — In February 2018, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2018-02, Income Statement—Reporting Comprehensive Income (Topic 220). The amendments in this update allow a reclassification from accumulated other comprehensive income (loss) to accumulated deficit for stranded tax effects resulting from the Tax Cuts and Jobs Act ("TCJA"). The Company has elected not to adopt the optional reclassification.

Leases: In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842). This update supersedes the lease requirements in Topic 840, Leases. The objective of Topic 842 is to establish the principles that lessees and lessors shall apply to report useful information to users of financial statements about the amount, timing, and uncertainty of cash flow arising from a lease. The Company adopted this update on January 1, 2019 using the modified retrospective method without the recasting of comparative periods' financial information, as permitted by the transition guidance. See Note 16, Leases.

Revenue Recognition: The Company adopted ASU 2014-09, as incorporated into Accounting Standards Codification (ASC) Topic 606, *Revenue from Contracts with Customers* ("ASC 606"), on January 1, 2018, which required it to recognize revenue when a customer obtains control rather than when substantially all risks and rewards of a good or service have been transferred. ASU 2014-09 was adopted by applying the modified retrospective method under which the cumulative effect is recognized in equity at the date of initial application. ASC 606 has been applied to all contracts at the date of initial application. The cumulative effect of the adoption was recognized as a decrease to accumulated deficit of $1 million.

Income Taxes: In October 2016, the FASB issued ASU 2016-16, Income Taxes—Intra Entity Transfers of Assets Other Than Inventory (Topic 740). The new standard changes the accounting for income taxes when a company transfers certain tangible and intangible assets, such as equipment or intellectual property, between entities in different tax jurisdictions. The new standard does not change the current accounting for the income taxes related to transfers of inventory. The Company adopted this ASU on January 1, 2018 using the modified retrospective method. The cumulative effect of the adoption was recognized as an increase to accumulated deficit of $1 million.

Accounting Standards Issued But Not Yet Adopted

Intangibles: In August 2018, the FASB issued ASU 2018-15, Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract. The amendments in this update align the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The accounting for the service element of a hosting arrangement that is a service contract is not affected by the amendments in this update. The amendments in this update are effective for interim and annual periods for the Company beginning on January 1, 2020. The amendments in this update should be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption. The Company is currently evaluating the potential effect of this new guidance on its consolidated financial statements.

Retirement Benefits: In August 2018, the FASB issued ASU 2018-14, Compensation-Retirement Benefits-Defined Benefit Plans-General (Subtopic 715-20). The amendments in this update remove disclosures that no longer are considered cost beneficial, clarify the specific requirements of disclosures, and add disclosure requirements identified as relevant. The amendments in this update are effective for fiscal years ending after December 15, 2020 with early adoption permitted. The Company evaluated the potential effect of this new guidance on its consolidated financial statements and concluded that it will not early adopt this standard.

Fair Value Measurements: In August 2018, the FASB issued ASU 2018-13, Fair Value Measurement (Topic 820). The new guidance modifies disclosure requirements related to fair value measurement. The amendments in this ASU are effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. Implementation on a prospective or retrospective basis varies by specific disclosure requirement. The standard also allows for early adoption of any removed or modified disclosures upon issuance of this ASU while delaying adoption of the additional disclosures until their effective date. The Company is currently evaluating the potential effect of this new guidance on its consolidated financial statements.

Income Taxes: In December 2019, the FASB issued ASU 2019-12, Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes (ASU 2019-12), which simplifies the accounting for income taxes. This guidance will be effective for the

Company in the first quarter of 2021 on a prospective basis, and early adoption is permitted. The Company is currently evaluating the potential effect of this new guidance on its consolidated financial statements.

3. Acquisitions and Divestitures

Öhlins Intressenter AB Acquisition

The Company finalized the valuation of the assets and liabilities of the Öhlins Acquisition during the fourth quarter of 2019. During the year ended December 31, 2019, the Company adjusted the initial allocation of the total purchase consideration, which resulted in a $14 million increase to goodwill.

The purchase price for the 90.5% ownership interest in Öhlins was $162 million. The remaining 9.5% ownership interest in Öhlins (the "KÖ Interest") was retained by K Öhlin Holding AB ("Köhlin"). Köhlin has an irrevocable right at any time after the third anniversary of the Öhlins Acquisition to sell the KÖ Interest to the Company. Refer to Note 2, Summary of Significant Accounting Policies, for further information on the KÖ Interest.

The following table summarizes the final fair values of assets acquired and liabilities assumed as of the acquisition date and the measurement period adjustments made during the year ended December 31, 2019:

	Initial Allocation	Adjustments	Final Allocation
Cash, cash equivalents, and restricted cash	$ 4	$ —	$ 4
Customer notes and accounts receivable	19	—	19
Inventories	31	—	31
Prepayments and other current assets	2	—	2
Property, plant, and equipment	8	—	8
Goodwill	28	14	42
Intangibles	135	(2)	133
Other assets	9	—	9
Total assets acquired	236	12	248
Short-term debt, including current maturities of long-term debt	10	—	10
Accounts payable	11	—	11
Accrued compensation and employee benefits	12	—	12
Deferred income taxes	18	12	30
Deferred credits and other liabilities	6	—	6
Total liabilities assumed	57	12	69
Redeemable noncontrolling interest	17	—	17
Net assets acquired	$ 162	$ —	$ 162

Goodwill of $42 million was recognized as part of the acquisition and is reflected in the Ride Performance segment. The goodwill consists of the Company's expected future economic benefits that will result from the acquisition of Öhlins' technology, which will allow the Company to more rapidly grow its product offerings for current and future customers, as well as assist the Company in obtaining a larger share of business in developing mobility markets. None of the goodwill is deductible for tax purposes.

Other intangible assets acquired include the following:

	Estimated Fair Value	Weighted-Average Useful Lives
Definite-lived intangible assets:		
Customer platforms and relationships	$ 37	10 years
Technology rights	41	10 years
Total definite-lived intangible assets	78	
Indefinite-lived intangible assets:		
Trade names and trademarks	55	
Total	$ 133	

The Company recorded a $5 million step-up of inventory to its fair value as of the acquisition date and recognized $5 million as a non-cash charge to cost of goods sold during the year ended December 31, 2019 related to the amortization of this step-up, as the acquired inventory was sold.

Pro Forma Results

Pro forma results of operations have not been presented because the effects of the Öhlins Acquisition were not material to the Company's consolidated results of operations.

Acquisition of Federal-Mogul

On October 1, 2018, the Company closed on the acquisition of all of the interests in Federal-Mogul pursuant to the Membership Interest Purchase Agreement, dated as of April 10, 2018 (the "Purchase Agreement"), by and among the Company, Federal-Mogul, American Entertainment Properties Corporation ("AEP" and, together with certain affiliated entities, the "Sellers") and Icahn Enterprises L.P. ("IEP"). Total consideration was approximately $3.7 billion. Following the completion of the Federal-Mogul Acquisition, Federal-Mogul was merged with and into the Company, with the Company continuing as the surviving company.

At the effective date of the Federal-Mogul Acquisition, the Company's certificate of incorporation was amended and restated (the "Amended and Restated Certificate of Incorporation") in order to create a new class of non-voting convertible common stock of the Company called "Class B Non-Voting Common Stock" ("Class B Common Stock") with 25,000,000 shares authorized, and to reclassify the Company's existing common stock as "Class A Voting Common Stock" ("Class A Common Stock" and, together with the Class B Common Stock, the "common stock"). See Note 18, Shareholders' Equity for additional information on the conversion features of the Class B Common Stock. On the same date, the Company also entered into a new credit facility in connection with the Federal-Mogul Acquisition. The new credit facility includes $4.9 billion of total debt financing, consisting of a five-year $1.5 billion revolving credit facility, a five-year $1.7 billion term loan A facility and a seven-year $1.7 billion term loan B facility. See Note 11, Debt and Other Financing Arrangements, for additional information.

Under the Amended and Restated Certificate of Incorporation, the authorized number of shares was increased from 185,000,000 shares, divided into 135,000,000 shares of common stock, par value $0.01, and 50,000,000 shares of preferred stock, par value $0.01, to 250,000,000 shares, divided into 175,000,000 shares of Class A Common Stock, 25,000,000 shares of Class B Common Stock and 50,000,000 shares of preferred stock, par value $0.01.

The Company (i) paid to AEP an aggregate amount in cash equal to $800 million (the "Cash Consideration") and (ii) issued and delivered to AEP an aggregate of 29,444,846 shares of common stock at $41.99 per share (the "Stock Consideration"). The $1.2 billion of common stock was comprised of: (a) 5,651,177 shares of Class A Common Stock, par value $0.01 equal to 9.9 percent of the aggregate number of shares of Class A Common Stock issued and outstanding immediately following the closing, and (b) 23,793,669 shares of newly created Class B Common Stock, par value $0.01. The remaining consideration of approximately $1.7 billion was comprised primarily of the repayments of certain Federal-Mogul debt obligations.

Advisory costs associated with the Federal-Mogul Acquisition were $68 million for the year ended December 31, 2018 and were recognized as a component of selling, general, and administrative expenses in the consolidated statements of income (loss).

The following table summarizes the purchase price (in millions, except for share data):

Tenneco shares issued for purchase of Federal-Mogul		29,444,846
Tenneco share price at October 1, 2018	$	41.99
Fair value of the Stock Consideration		1,236
Cash Consideration[a]		811
Repayment of Federal-Mogul debt and accrued interest [b]		1,660
Total consideration	$	3,707

[a] Cash consideration also included $11 million in advisory fees paid to a third-party.
[b] Portion of the proceeds from the issuance of the $4.9 billion new credit facility that was used to repay Federal-Mogul's term loan and revolver loan of $1,455 million and $200 million, and the related accrued interest of $5 million.

The following table summarizes the final fair values of assets acquired and liabilities assumed as of the acquisition date and the measurement period adjustments made during the year ended December 31, 2019:

	Initial Allocation	Adjustments	Final Allocation
Cash, cash equivalents, and restricted cash	$ 277	$ —	$ 277
Customer notes and accounts receivable	1,258	(4)	1,254
Other receivables	62	—	62
Inventories	1,551	(8)	1,543
Prepayments and other current assets	198	—	198
Property, plant, and equipment	1,711	(28)	1,683
Long-term receivables	48	—	48
Goodwill	825	(22)	803
Intangibles	1,530	47	1,577
Investments in nonconsolidated affiliates	528	(4)	524
Deferred income taxes	166	30	196
Other assets	55	(5)	50
Total assets acquired	8,209	6	8,215
Short-term debt, including current maturities of long-term debt	130	—	130
Accounts payable	957	4	961
Accrued compensation and employee benefits	231	—	231
Accrued income taxes	49	—	49
Accrued expenses and other current liabilities	522	(7)	515
Long-term debt	1,315	—	1,315
Deferred income taxes	56	24	80
Pension and postretirement benefits	879	—	879
Deferred credits and other liabilities	124	(5)	119
Total liabilities assumed	4,263	16	4,279
Redeemable noncontrolling interests	96	(8)	88
Noncontrolling interests	143	(2)	141
Net assets and noncontrolling interests acquired	$ 3,707	$ —	$ 3,707

Goodwill of $343 million was allocated to the Powertrain segment, $395 million was allocated to the Motorparts segment, and $65 million was allocated to the Ride Performance segment. The goodwill consists of the Company's expected future economic benefits that will arise from expected future product sales and synergies from combining Federal-Mogul with its existing portfolio of products. None of the goodwill is deductible for tax purposes.

Other intangible assets acquired include the following:

	Estimated Fair Value	Weighted-Average Useful Lives
Definite-lived intangible assets:		
Customer platforms and relationships	$ 953	10 years
Technology rights	66	10 years
Packaged kits know-how	54	10 years
Catalogs	47	10 years
Licensing agreements	64	4.5 years
Land use rights	30	42.8 years
Total definite-lived intangible assets	1,214	
Indefinite-lived intangible assets:		
Trade names and trademarks	363	
Total	$ 1,577	

The Company recorded a $149 million step-up of inventory to its fair value as of the acquisition date. The Company recognized non-cash charges to cost of goods sold of $44 million and $105 million for the years ended December 31, 2019 and 2018.

The Company's consolidated statements of income (loss) included net sales and operating revenues of $7,218 million and $1,886 million for the year ended December 31, 2019 and 2018, and a net loss of $269 million and $69 million for the year ended December 31, 2019 and 2018 associated with the operating results of Federal-Mogul.

Pro Forma Results (Unaudited)
The following table summarizes, on a pro forma basis, the combined results of operations of the Company and Federal-Mogul business as though the Acquisition and the related financing had occurred as of January 1, 2017. The pro forma results are not necessarily indicative of either the actual consolidated results had the acquisition of Federal-Mogul occurred on January 1, 2017 or of future consolidated operating results. Actual operating results for the year ended December 31, 2019 have been included in the table below for comparative purposes.

	Actual	Pro Forma	
	For the Year Ended December 31		
	2019	2018	2017
Net sales and operating revenues	$ 17,450	$ 17,860	$ 17,153
Earnings (loss) before income taxes and noncontrolling interests	$ (201)	$ 488	$ 235
Net income (loss) attributable to Tenneco Inc.	$ (334)	$ 275	$ 372
Basic earnings (loss) per share of common stock	$ (4.12)	$ 3.41	$ 4.52
Diluted earnings (loss) per share of common stock	$ (4.12)	$ 3.40	$ 4.51

These pro forma amounts have been calculated after applying the Company's accounting policies and the results presented above primarily reflect: (i) depreciation adjustments relating to fair value adjustments to property, plant, and equipment; (ii) amortization adjustments relating to fair value estimates of intangible assets; (iii) incremental interest expense, net on assumed indebtedness, the new credit facility, debt issuance costs, and fair value adjustments to debt; (iv) adjustment for loss to income available to common shareholders from noncontrolling interest tender offer; and (v) cost of goods sold adjustments relating to fair value adjustments to inventory. Pro forma adjustments described above have been tax affected using the Company's effective rate during the respective periods.

In 2018, the Company incurred $96 million of acquisition related costs. These expenses are included in Selling, general, and administrative on the Company's consolidated statements of income (loss) for the year ended December 31, 2018. These expenses, as well as $4 million of expenses incurred by Federal-Mogul in 2018 prior to the acquisition, are reflected in the pro forma earnings for the year ended December 31, 2017, in the table above.

Other Matters Related to the Federal-Mogul Acquisition
On March 3, 2017, and May 1, 2017, certain purported former stockholders of Federal-Mogul Holdings Corporation ("FMHC") filed a petition in the Delaware Court of Chancery seeking an appraisal of the value of common stock they claim to have held at the time of the January 23, 2017 merger of IEH FM Holdings, LLC into FMHC. IEH FM Holdings, LLC was a wholly owned subsidiary of AEP and a subsidiary of IEP. The two cases were consolidated on May 10, 2017 into: "In re Appraisal of Federal-Mogul Holdings LLC, C.A. No. 2017-0158-AGB."

Federal-Mogul received a capital contribution of $56 million on June 29, 2018 from its then-parent, IEP, in connection with this matter. At October 1, 2018, Federal-Mogul's litigation reserve was $55 million, along with accrued interest of $6 million, which was assumed as part of the Federal-Mogul Acquisition. On October 19, 2018, the Company reached an agreement with the plaintiffs to settle their claims for $12.01 per share, inclusive of interest payable, or an aggregate of approximately $61 million. The Company paid this settlement in the fourth quarter of 2018.

Assets Held for Sale
The Company classifies assets and liabilities as held for sale ("disposal group") when management, having the authority to approve the action, commits to a plan to sell the disposal group, the sale is probable within one year, and the disposal group is available for immediate sale in its present condition. The Company also considers whether an active program to locate a buyer has been initiated, whether the disposal group is marketed actively for sale at a price that is reasonable in relation to its current fair value, and whether actions required to complete the plan indicate it is unlikely significant changes to the plan will be made or the plan will be withdrawn.

As the Company continues to rationalize its product portfolio and focus on core product lines, the Company has classified a non-core business in the Motorparts segment as held for sale. As of December 31, 2019, expected proceeds from a sale would have been $22 million, which is representative of its fair value. The related assets and liabilities were classified as held for sale as of December 31, 2019. A sale is expected to occur within the next year.

On March 1, 2019, in accordance with a stock and asset purchase agreement, the Company sold certain assets and liabilities related to its wipers business in the Motorparts segment for a sale price of $29 million, subject to adjustment based on terms of the sale agreement. Proceeds from the sale were $22 million, subject to customary working capital adjustments. The majority of the assets and liabilities transferred on the closing date and the remaining assets and liabilities transferred to the buyer on October 1, 2019. The related assets and liabilities were classified as held for sale as of December 31, 2018.

The related assets and liabilities classified as held for sale as of December 31, 2019 and 2018 were as follows:

	December 31	
	2019	2018
Assets		
Receivables	$ 5	$ —
Inventories	8	33
Other current assets	1	5
Long-lived assets	18	23
Goodwill	4	—
Impairment on carrying value	(8)	—
Total assets held for sale	$ 28	$ 61
Liabilities		
Accounts payable	4	21
Accrued liabilities	2	7
Other liabilities	—	11
Total liabilities held for sale	$ 6	$ 39

The assets and liabilities held for sale are recorded in prepayments and other current assets and accrued expenses and other current liabilities in the consolidated balance sheets as of December 31, 2019 and 2018.

4. Restructuring Charges, Asset Impairments, and Other, Net

Restructuring and Other Charges

The Company's restructuring activities are undertaken as necessary to execute management's strategy and streamline operations, consolidate and take advantage of available capacity and resources, and ultimately achieve net cost reductions. Restructuring activities include efforts to integrate and rationalize the Company's business and to relocate operations to best cost locations.

The Company's restructuring charges consist primarily of employee costs (principally severance and/or termination benefits), and facility closure and exit costs.

For the years ended December 31, 2019, 2018, and 2017, restructuring charges, net and asset impairments by segment are as follows:

	Year Ended December 31, 2019					
	Clean Air	Powertrain	Ride Performance	Motorparts	Corporate	Total
Severance and other charges, net	$ 29	$ 31	$ 28	$ 14	$ 11	$ 113
Restructuring asset impairments	—	—	3	—	—	3
Other non-restructuring asset impairments	1	—	—	1	—	2
Impairment of assets held for sale	—	—	—	8	—	8
Total asset impairment charges	1	—	3	9	—	13
Total restructuring charges, asset impairments, and other	$ 30	$ 31	$ 31	$ 23	$ 11	$ 126

	Year Ended December 31, 2018					
	Clean Air	Powertrain	Ride Performance	Motorparts	Corporate	Total
Severance and other charges, net	$ 14	$ (2)	$ 53	$ 42	$ 5	$ 112
Restructuring asset impairments	—	—	3	—	—	3
Other non-restructuring asset impairments	—	—	—	—	2	2
Total asset impairment charges	—	—	3	—	2	5
Total restructuring charges, asset impairments, and other	$ 14	$ (2)	$ 56	$ 42	$ 7	$ 117

	Year Ended December 31, 2017					
	Clean Air	Powertrain	Ride Performance	Motorparts	Corporate	Total
Severance and other charges, net	$ 23	$ —	$ 16	$ 7	$ 1	$ 47
Total asset impairment charges	—	—	—	—	—	—
Total restructuring charges, asset impairments, and other	$ 23	$ —	$ 16	$ 7	$ 1	$ 47

In the year ended December 31, 2019, the Company incurred charges for the following items:

- The Company incurred $12 million in restructuring and related costs and decreased previously recorded estimates by $3 million related to a restructuring plan designed to achieve a portion of the synergies the Company anticipates achieving in connection with the Federal-Mogul Acquisition. Pursuant to the plan, the Company will reduce its headcount globally across all segments. The Company began implementing headcount reductions in January 2019. The Federal-Mogul Acquisition is discussed further in Note 3, Acquisitions and Divestitures.

- The Company incurred $20 million in restructuring and other costs, offset by $6 million in changes to previously recorded estimates, related to several actions in Europe within its Clean Air segment. These actions included a plant closure, plant consolidation actions, and headcount reduction initiatives. Clean Air also incurred $14 million in restructuring and other costs in Asia related to the wind-down of one of its consolidated joint ventures, a plant closure, plant consolidation, and a headcount reduction initiative.
- The Company incurred $22 million in restructuring and other costs related to a global cost reduction program within Powertrain segment and $5 million in costs related to a plant closure.
- The Company incurred $19 million in restructuring and other costs related to plant relocation and closures within its Ride Performance segment. The Company expects the actions to be completed by the second quarter of 2020.
- The Company incurred $10 million in restructuring and other costs primarily related to head count reduction initiatives within its Motorparts segment.
- The Company incurred $9 million in restructuring for the elimination of certain redundant positions within the executive management team recognized in corporate.

In the year ended December 31, 2018, the Company incurred charges for the following items:

- The Company incurred $25 million in restructuring and related costs, related to the accelerated move of the Beijing Ride Performance plant. This move was completed in 2019.
- The Company incurred $10 million in restructuring charges related to headcount reductions at a Clean Air manufacturing plant in Germany.
- In October 2018, the Company announced a plan to close its ride performance plants in Owen Sound, Ontario and Hartwell, Georgia as part of an initiative to realign its manufacturing footprint to enhance operational efficiency and respond to changing market conditions and capacity requirements. The Company recorded charges of $21 million in 2018, including asset write-downs of $3 million. The charges included severance payments to employees, the cost of decommissioning equipment, and other costs associated with this action.
- The Company incurred a $45 million charge related to a restructuring plan designed to achieve a portion of the synergies the Company anticipates achieving in connection with the acquisition of Federal-Mogul. Pursuant to the plan, the Company will reduce its headcount globally across all segments. The Company began implementing headcount reductions in January 2019 and actions continued through the end of 2019. The Federal-Mogul Acquisition is discussed further in Note 3, Acquisitions and Divestitures.
- The Company incurred an additional $16 million in restructuring and related costs, including asset write-downs of $2 million, for cost improvement initiatives at various other operations around the world.

In the year ended December 31, 2017, the Company incurred charges for the following items:

- On June 29, 2017, the Company announced a restructuring initiative to close its Clean Air manufacturing plant in O'Sullivan Beach, Australia and downsize its Ride Performance plant in Clovelly Park, Australia when General Motors and Toyota ended vehicle production in the country in October 2017. All such restructuring activities related to this initiative were completed in 2018. The Company recorded total charges related to this initiative of $19 million in 2017. The charges included severance payments to employees, the cost of decommissioning equipment, a lease termination payment, and other costs associated with this action.
- In the fourth quarter of 2017, the Company began to accelerate a required move of its Beijing Ride Performance plant outside of Beijing area. The Company incurred $6 million of restructuring and related costs due to this relocation.
- The Company recognized a $9 million charge related to the planned closing of its Clean Air plant in Ghent, Belgium due to the scheduled end of production on a customer platform in 2020.
- The Company incurred an additional $13 million in restructuring and related costs for cost improvement initiatives at various other operations around the world.

Restructuring Reserve Rollforward

The following table is a rollforward of amounts related to activities that were charged to restructuring reserves by reportable segments for the years ended December 31, 2019, 2018, and 2017:

	Clean Air	Powertrain	Ride Performance	Motorparts	Total Reportable Segments	Corporate	Total
Balance at December 31, 2016	$ 2	$ —	$ 6	$ 6	$ 14	$ 1	$ 15
Provisions	23	—	16	7	46	1	47
Payments	(12)	—	(16)	(9)	(37)	(2)	(39)
Foreign currency	1	—	1	—	2	—	2
Balance at December 31, 2017	14	—	7	4	25	—	25
Federal-Mogul Acquisition	—	22	1	14	37	—	37
Provisions	14	1	53	42	110	5	115
Held for sale	—	—	—	(2)	(2)	—	(2)
Revisions to estimates	—	(3)	—	—	(3)	—	(3)
Payments	(10)	(5)	(36)	(15)	(66)	(2)	(68)
Foreign currency	(1)	—	—	—	(1)	—	(1)
Balance at December 31, 2018	17	15	25	43	100	3	103
Provisions	35	31	29	19	114	11	125
Revisions to estimates	(6)	—	(1)	(5)	(12)	—	(12)
Payments	(23)	(16)	(30)	(41)	(110)	(5)	(115)
Balance at December 31, 2019	$ 23	$ 30	$ 23	$ 16	$ 92	$ 9	$ 101

The following table provides a summary of the Company's consolidated restructuring liabilities and related activity for each type of exit costs for the years ended December 31, 2019, 2018, and 2017:

	Employee Costs	Facility Closure and Other Costs	Total
Balance at December 31, 2016	$ 8	$ 7	$ 15
Provisions	31	16	47
Payments	(22)	(17)	(39)
Foreign currency	2	—	2
Balance at December 31, 2017	19	6	25
Federal-Mogul Acquisition	37	—	37
Provisions	90	25	115
Held for sale	(2)	—	(2)
Revisions to estimates	(4)	1	(3)
Payments	(41)	(27)	(68)
Foreign currency	(1)	—	(1)
Balance at December 31, 2018	98	5	103
Provisions	103	22	125
Revisions to estimates	(12)	—	(12)
Payments	(92)	(23)	(115)
Balance at December 31, 2019	$ 97	$ 4	$ 101

5. Inventories

At December 31, 2019 and 2018, inventory by major classification was as follows:

	December 31	
	2019	2018
Finished goods	$ 1,027	$ 1,116
Work in process	460	562
Raw materials	408	457
Materials and supplies	104	110
Total inventories	$ 1,999	$ 2,245

6. Property, Plant and Equipment, Net

The components of property, plant and equipment—net were as follows:

	December 31		
	2019	2018	Useful Life
Land	$ 270	$ 293	—
Buildings and improvements	1,058	1,023	10 to 50 years
Machinery, equipment and tooling	4,503	4,041	3 to 25 years
Capitalized software	397	378	3 to 12 years
Other, including construction in progress	570	568	—
Property, plant and equipment, cost	6,798	6,303	
Less: Accumulated depreciation and amortization	(3,171)	(2,802)	
Property, plant and equipment, net	$ 3,627	$ 3,501	

For the years ended December 31, 2019, 2018, and 2017 depreciation and amortization related to property, plant and equipment was $535 million, $313 million, and $223 million.

7. Goodwill and Other Intangible Assets

The Company performed a quantitative goodwill and indefinite-lived asset impairment analysis during the fourth quarter. The basis of the goodwill impairment and indefinite-lived intangible asset analyses is the Company's annual budget and three-year strategic plan. This includes a projection of future cash flows, which requires the Company to make significant assumptions and estimates about the extent and timing of future cash flows and revenue growth rates. These represent Company-specific inputs and assumptions about the use of the assets, as observable inputs are not available. These estimates and assumptions are subject to a high degree of uncertainty. Due to the many variables inherent in estimating fair value and the relative size of the goodwill and indefinite-lived intangible assets, differences in assumptions could have a material effect on the results of the analyses.

In the goodwill impairment analysis, for reporting units with goodwill, fair values are estimated using a combination of the income approach and market approach. The Company applies a 75% weighting to the income approach and a 25% weighting to the market approach. The most significant inputs in estimating the fair value of the Company's reporting units under the income approach are (i) projected operating margins, (ii) the revenue growth rate, and (iii) the discount rate, which is risk-adjusted based on the aforementioned inputs.

For the indefinite-lived asset impairment analysis, the fair value is based upon the prospective stream of hypothetical after-tax royalty cost savings discounted at rates that reflect the rates of return appropriate for these intangible assets. The primary, and most sensitive, inputs utilized in determining fair values of trade names and trademarks are (i) projected branded product sales, (ii) the revenue growth rate, (iii) the royalty rate, and (iv) the discount rate, which is risk-adjusted based on the projected branded sales.

At December 31, 2019 and 2018, goodwill consisted of the following:

	December 31, 2019				
	Clean Air	Powertrain	Ride Performance	Motorparts	Total
Gross carrying amount at beginning of period	$ 22	$ 388	$ 210	$ 611	$ 1,231
Measurement period adjustments	—	(45)	24	13	(8)
Acquisitions	—	—	28	—	28
Reclassification to assets held for sale	—	—	—	(4)	(4)
Foreign exchange	—	—	(3)	—	(3)
Gross carrying amount at end of period	22	343	259	620	1,244
Accumulated impairment loss at beginning of period	—	—	(143)	(219)	(362)
Impairment	—	(18)	(69)	(21)	(108)
Foreign exchange	—	—	—	1	1
Accumulated impairment loss at end of period	—	(18)	(212)	(239)	(469)
Net carrying value at end of period	$ 22	$ 325	$ 47	$ 381	$ 775

	December 31, 2018				
	Clean Air	Powertrain	Ride Performance	Motorparts	Total
Gross carrying amount at beginning of period	$ 23	$ —	$ 156	$ 229	$ 408
Acquisitions	—	388	55	382	825
Foreign exchange	(1)	—	(1)	—	(2)
Gross carrying amount at end of period	22	388	210	611	1,231
Accumulated impairment loss at beginning of period	—	—	(140)	(219)	(359)
Impairment	—	—	(3)	—	(3)
Foreign exchange	—	—	—	—	—
Accumulated impairment loss at end of period	—	—	(143)	(219)	(362)
Net carrying value at end of period	$ 22	$ 388	$ 67	$ 392	$ 869

The Öhlins Acquisition resulted in $42 million of goodwill which was included in the Ride Performance segment and the Federal-Mogul Acquisition resulted in goodwill of $803 million. During the year ended December 31, 2019, the Company made the following adjustments to goodwill in the measurement period to the preliminary purchase price allocation for the Acquisitions:

- an increase of $14 million for the Öhlins Acquisition; and
- a net decrease of $22 million for the Federal-Mogul Acquisition.

The Company recognized goodwill impairment charges of $108 million for the year ended December 31, 2019, which consisted of the following:

- During the first quarter of 2019, the Company reorganized the reporting structure of its Aftermarket, Ride Performance, and Motorparts segments and the underlying reporting units within those segments. The Company reassigned assets and liabilities (excluding goodwill) to the reporting units affected. Goodwill was then reassigned to the reporting units using a relative fair value approach based on the fair value of the elements transferred and the fair value of the elements remaining within the original reporting units. The Company tested goodwill for impairment on a pre-reorganization basis and determined there was no impairment for the affected reporting units. The Company also performed an impairment analysis on a post-reorganization basis and determined $60 million of goodwill was impaired for two reporting units within its Ride Performance segment, one of which was a full impairment of the goodwill. As a result, this non-cash charge was recorded in the first quarter of 2019. Goodwill allocated to other reporting units was supported by the valuation performed at that time;

- During the third quarter of 2019, the Company finalized purchase accounting for the Federal-Mogul Acquisition. As a result, the final goodwill allocation was reassigned to the reorganized segments and reporting unit structure that occurred in the first quarter of 2019 using a relative fair value approach and the Company determined an incremental $9 million of goodwill was impaired for one reporting unit in its Ride Performance segment, which continued to represent a full impairment of goodwill in that reporting unit. This non-cash charge was recorded in the third quarter of 2019; and

- As a result of the annual goodwill impairment analysis performed in the fourth quarter of 2019, the estimated fair value of one of the reporting units in the Motorparts segment was lower than its carrying value and an impairment charge of $21 million was recognized, which was a full impairment of the goodwill in that reporting unit. Additionally, the estimated fair value of one of the reporting units in the Powertrain segment was determined to be lower than the carrying value, and a partial goodwill impairment charge of $18 million was recognized. At December 31, 2019, this reporting unit has $40 million of goodwill after recognizing the impairment. This non-cash charge was recorded in the fourth quarter of 2019.

The following table shows a summary of the number of reporting units with goodwill in each segment and whether or not the reporting unit's fair value exceeds its carrying value by more or less than 10%:

	Segments			
	Clean Air	**Powertrain**	**Ride Performance**	**Motorparts**
Number of reporting units with goodwill	3	2	2	1
Number of reporting units where fair value exceeds carrying value:				
Greater than 10%	3	—	1	1
Less than 10%		2	1	—
Goodwill for reporting units where fair value exceeds carrying value:				
Greater than 10%	$ 22	$ —	$ 7	$ 381
Less than 10%	—	325	40	—
	$ 22	$ 325	$ 47	$ 381

The three reporting units above where fair value is not in excess of carrying value by 10% or more are reporting units acquired as part of the Acquisitions.

As a result of the goodwill impairment analysis in the fourth quarter of 2018, the estimated fair value for one reporting unit in the Ride Performance segment was lower than its carrying value and an impairment charge of $3 million was recognized for the year ended December 31, 2018.

As a result of the goodwill impairment analysis in the fourth quarter of 2017, the Company recognized goodwill impairment charges of $11 million for the year ended December 31, 2017. The estimated fair value for one reporting unit in the Ride Performance segment was lower than its carrying value and an impairment charge of $7 million was recognized. Additionally, the estimated fair value for one reporting unit in the Motorparts segment was lower than its carrying value and an impairment charge of $4 million was recognized.

At December 31, 2019 and 2018, intangible assets consisted of the following:

		December 31, 2019			December 31, 2018		
	Useful Lives	Gross Carrying Value	Accumulated Amortization	Net Carrying Value	Gross Carrying Value	Accumulated Amortization	Net Carrying Value
Definite-lived intangible assets:							
Customer relationships and platforms	10 years	$ 988	$ (123)	$ 865	$ 964	$ (24)	$ 940
Customer contract	10 years	8	(6)	2	8	(5)	3
Patents	10 to 17 years	1	(1)	—	1	(1)	—
Technology rights	10 to 30 years	133	(37)	96	98	(27)	71
Packaged kits know-how	10 years	54	(7)	47	36	(1)	35
Catalogs	10 years	47	(6)	41	—	—	—
Licensing agreements	3 to 5 years	63	(18)	45	66	(3)	63
Land use rights	28 to 46 years	47	(3)	44	44	(2)	42
		$ 1,341	$ (201)	$ 1,140	$ 1,217	$ (63)	$ 1,154
Indefinite-lived intangible assets:							
Trade names and trademarks				282			365
Total				$ 1,422			$ 1,519

The Company recorded definite-lived and indefinite-lived intangible assets of $133 million as a result of the Öhlins Acquisition and the Federal-Mogul Acquisition resulted in $1.6 billion of definite-lived and indefinite-lived intangible assets. During the year ended December 31, 2019, the Company made the following adjustments to these intangible assets in the measurement period to the preliminary purchase price allocation for the Acquisitions:

- a decrease of $2 million was recognized for the Öhlins Acquisition; and
- a net increase of $47 million was recognized for the Federal-Mogul Acquisition.

Amortization expense of definite-lived intangible assets for the year ended December 31, 2019, 2018, and 2017 was $138 million, $32 million, and $3 million and is included in depreciation and amortization within the consolidated statements of income (loss).

As a result of the annual indefinite-lived intangible asset analysis performed in the fourth quarter of 2019, the estimated fair value of the trademarks and trade names for two reporting units in the Motorparts segment were less than their carrying values. Accordingly, non-cash impairment charges of $133 million were recognized, both of which were partial impairments. As a result, the carrying value equals fair value at December 31, 2019.

The expected future amortization expense for the Company's definite-lived intangible assets is as follows:

	2020	2021	2022	2023	2024	2025 and thereafter	Total
Expected Amortization Expense	$ 138	$ 135	$ 131	$ 129	$ 122	$ 483	$ 1,140

8. Investment in Nonconsolidated Affiliates

As a result of the Federal-Mogul Acquisition, the Company has investments in several nonconsolidated affiliates, which are primarily located in China, Korea, Turkey, and the U.S.

The Company's ownership interest in affiliates accounted for under the equity method is as follows:

	At December 31	
	2019	2018
Anqing TP Goetze Piston Ring Company Limited (China)	35.7%	35.7%
Anqing TP Powder Metallurgy Co., Ltd (China)	20.0%	20.0%
Dongsuh Federal-Mogul Industrial Co. Ltd. (Korea)	50.0%	50.0%
Farloc Argentina SAIC Y F (Argentina)	23.9%	23.9%
Federal-Mogul Powertrain Otomotiv A.S. (Turkey)	50.0%	50.0%
Federal-Mogul TP Liner Europe Otomotiv Ltd. Sti. (Turkey)	25.0%	25.0%
Federal-Mogul TP Liners, Inc. (USA)	46.0%	46.0%
Frenos Hidraulicos Automotrices, S.A. de C.V. (Mexico)	49.0%	49.0%
JURID do Brasil Sistemas Automotivos Ltda. (Brazil)	19.9%	19.9%
KB Autosys Co., Ltd. (Korea)	33.6%	33.6%
Montagewerk Abgastechnik Emden GmbH (Germany)[a]	50.0%	50.0%

[a] This nonconsolidated affiliate was the only equity method investment not acquired as part of the Federal-Mogul Acquisition.

The Company's investments in its nonconsolidated affiliates were as follows:

	At December 31	
	2019	2018
Investments in nonconsolidated affiliates	$ 518	$ 544

During 2019, the Company made adjustments in the measurement period to the preliminary purchase price allocation for the Federal-Mogul Acquisition which resulted in a reduction to the fair value of its investments in nonconsolidated affiliates of $4 million.

The carrying amount of the Company's investments in nonconsolidated affiliates accounted for under the equity method exceeded its share of the underlying net assets by $251 million and $207 million at December 31, 2019 and 2018.

The following table represents the activity from the Company's investments in its nonconsolidated affiliates:

	Year Ended December 31		
	2019	2018	2017
Equity earnings (losses) of nonconsolidated affiliates, net of tax	$ 43	$ 18	$ (1)
Cash dividends received from nonconsolidated affiliates	$ 53	$ 2	$ —

As a result of finalizing purchase accounting for the Federal-Mogul Acquisition, and completing a purchase price allocation for certain equity method investments, equity earnings (losses) for the year ended December 31, 2019 includes a non-cash reduction of $12 million, which represents amounts to recognize the basis difference between the fair value and book value of certain assets, including inventory, property, plant and equipment, and intangible assets. The purchase price allocation for the Federal-Mogul Acquisition was finalized in the third quarter of 2019. See Note 3, Acquisitions and Divestitures, for additional information.

The following tables present summarized aggregated financial information of the Company's nonconsolidated affiliates as of and for the year ended December 31, 2019:

	Year Ended December 31, 2019			
Statements of Income	Otomotiv A.S.	Anqing TP Goetze	Other	Total
Sales	$ 349	$ 151	$ 479	$ 979
Gross profit	$ 79	$ 44	$ 89	$ 212
Income from continuing operations	$ 63	$ 38	$ 47	$ 148
Net income	$ 60	$ 35	$ 41	$ 136

	December 31, 2019			
Balance Sheets	Otomotiv A.S.	Anqing TP Goetze	Other	Total
Current assets	$ 102	$ 151	$ 244	$ 497
Noncurrent assets	$ 106	$ 139	$ 186	$ 431
Current liabilities	$ 30	$ 45	$ 112	$ 187
Noncurrent liabilities	$ 69	$ —	$ 16	$ 85

The following tables present summarized aggregated financial information of the Company's nonconsolidated affiliates as of and for the year ended December 31, 2018:

	Year Ended December 31, 2018			
Statements of Income	Otomotiv A.S.	Anqing TP Goetze	Other	Total
Sales	$ 92	$ 41	$ 137	$ 270
Gross profit	$ 23	$ 13	$ 33	$ 69
Income from continuing operations	$ 26	$ 13	$ 10	$ 49
Net income	$ 22	$ 12	$ 8	$ 42

	December 31, 2018			
Balance Sheets	Otomotiv A.S.	Anqing TP Goetze	Other	Total
Current assets	$ 129	$ 164	$ 249	$ 542
Noncurrent assets	$ 300	$ 132	$ 200	$ 632
Current liabilities	$ 70	$ 40	$ 131	$ 241
Noncurrent liabilities	$ 82	$ —	$ 11	$ 93

See Note 22, Related Party Transactions for additional information on balances and transactions with equity method investments.

9. Derivatives and Hedging Activities

The Company is exposed to market risk, such as fluctuations in foreign currency exchange rates, commodity prices, equity compensation liabilities, and changes in interest rates, which may result in cash flow risks. For exposures not offset within its operations, the Company enters into various derivative transactions pursuant to its risk management policies, which prohibit holding or issuing derivative financial instruments for speculative purposes. Designation of derivative instruments is performed on a transaction basis to support hedge accounting. The changes in fair value of these hedging instruments are offset in part or in whole by corresponding changes in the fair value or cash flows of the underlying exposures being hedged. The Company assesses the initial and ongoing effectiveness of its hedging relationships in accordance with its documented policy.

Foreign Currency Risk
The Company manufactures and sells its products in North America, South America, Asia, Europe, and Africa. As a result, the Company's financial results could be significantly affected by factors such as changes in foreign currency exchange rates or weak economic conditions in foreign markets in which the Company manufactures and sells its products. The Company generally tries to use natural hedges within its foreign currency activities, including the matching of revenues and costs, to minimize foreign currency risk. Where natural hedges are not in place, the Company considers managing certain aspects of its foreign currency activities and larger transactions through the use of foreign currency options or forward contracts. Principal currencies hedged have historically included the U.S. dollar, euro, British pound, Polish zloty, Singapore dollar, and Mexican peso.

Concentrations of Credit Risk
Financial instruments including cash equivalents and derivative contracts expose the Company to counterparty credit risk for non-performance. The Company's counterparties for cash equivalents and derivative contracts are banks and financial institutions that meet the Company's requirement of high credit standing. The Company's counterparties for derivative contracts are substantial investment and commercial banks with significant experience using such derivatives. The Company manages its credit risk through policies requiring minimum credit standing and limiting credit exposure to any one counterparty and through monitoring counterparty credit risks. The Company's concentration of credit risk related to derivative contracts at December 31, 2019 and 2018 is not material.

Other
The Company presents its derivative positions and any related material collateral under master netting agreements on a net basis. For derivatives designated as cash flow hedges, changes in the time value are excluded from the assessment of hedge effectiveness. Unrealized gains and losses associated with ineffective hedges, determined using the hypothetical derivative method, are recognized in cost of sales in the consolidated statements of income (loss). Derivative gains and losses included in accumulated other comprehensive income (loss) for effective hedges are reclassified into operations upon recognition of the hedged transaction. Derivative gains and losses associated with undesignated hedges are recognized in "Cost of sales" in the consolidated statements of income (loss).

Derivative Instruments
Foreign currency forward contracts — The Company enters into foreign currency forward purchase and sale contracts to mitigate its exposure to changes in exchange rates on certain intercompany and third-party trade receivables and payables. In managing its foreign currency exposures, the Company identifies and aggregates existing offsetting positions and then hedges residual exposures through third-party derivative contracts. The gains or losses on these contracts is recorded in cost of sales in the consolidated statements of income (loss). The fair value of foreign currency forward contracts are recorded in prepayments and other current assets or accrued expenses and other current liabilities in the consolidated balance sheets. The fair value of the Company's foreign currency forward contracts was a net asset position of less than $1 million at December 31, 2019 and 2018.

The following table summarizes by major currency the notional amounts for foreign currency forward purchase and sale contracts as of December 31, 2019 (all of which mature in 2020):

		Notional Amount in Foreign Currency
British pounds	—Purchase	4
	—Sell	(1)
Canadian dollars	—Sell	(2)
European euro	—Sell	(21)
Japanese yen	—Sell	(251)
Polish zloty	—Purchase	71
Singapore dollars	—Sell	(17)
South African rand	—Sell	(49)
Mexican pesos	—Purchase	14
U.S. dollars	—Purchase	20

Cash-settled Share Swap Transactions — In the second quarter of 2019, the Company entered into an amended and restated equity swap agreement. The Company selectively uses cash-settled share swaps to reduce market risk associated with its deferred compensation liabilities. These equity deferred compensation liabilities increase as the Company's stock price increases and decrease as the Company's stock price decreases. In contrast, the value of the swap agreement moves in the opposite direction of these liabilities, allowing the Company to fix a portion of the liabilities at a stated amount. As of December 31, 2019, the Company hedged its deferred compensation liability related to approximately 600,000 common share equivalents, an increase from 250,000 common share equivalents as of December 31, 2018. The fair value of the equity swap agreement is recorded in prepayments and other current assets or accrued expenses and other current liabilities in the consolidated balance sheets. The fair value of the Company's equity swap agreement was a net liability position of $1 million and a net asset position of $4 million at December 31, 2019 and 2018.

Hedging Instruments

Cash Flow Hedges—Commodity Price Risk — The Company's production processes are dependent upon the supply of certain raw materials that are exposed to price fluctuations on the open market. The primary purpose of the Company's commodity price forward contract activity is to manage the volatility associated with forecasted purchases for up to eighteen months in the future. The Company monitors its commodity price risk exposures regularly to maximize the overall effectiveness of its commodity forward contracts. Principal raw materials hedged include copper and tin. In certain instances, within this program, foreign currency forwards may be used in order to match critical terms for commodity exposure.

The Company has designated these contracts as cash flow hedging instruments. The Company records unrecognized gains and losses in other comprehensive income (loss) ("OCI or OCL") and makes regular reclassifying adjustments into cost of sales within the consolidated statements of income (loss) when the underlying hedged transaction is recognized in earnings. The Company had commodity derivatives outstanding with an equivalent notional amount of $19 million and $27 million at December 31, 2019 and 2018. Substantially all of the commodity price hedge contracts mature within one year.

Net Investment Hedge – Foreign Currency Borrowings — The Company has foreign currency denominated debt, €758 million of which was designated as a net investment hedge in certain foreign subsidiaries and affiliates of the Company. Changes to its carrying value are included in shareholders' equity in the foreign currency translation component of OCL and offset against the translation adjustments on the underlying net assets of those foreign subsidiaries and affiliates, which are also recorded in OCL. The Company's debt instruments are discussed further in Note 11, Debt and Other Financing Arrangements .

The following table is a summary of the carrying value of derivative and non-derivative instruments designated as hedges at December 31, 2019 and 2018:

		December 31	
	Balance sheets classification	**2019**	**2018**
Commodity price hedge contracts designated as cash flow hedges	Accrued expenses and other current liabilities	$ —	$ (2)
Foreign currency borrowings designated as net investment hedges	Long-term debt	$ 850	$ 863

The following table represents the effects before reclassification into net income of derivative and non-derivative instruments designated as hedges in accumulated other comprehensive income (loss) at December 31, 2019 and 2018:

	Amount of gain (loss) recognized in accumulated OCI or OCL (effective portion)	
	December 31	
	2019	**2018**
Commodity price hedge contracts designated as cash flow hedges	$ 1	$
Foreign currency borrowings designated as net investment hedges	$ 20	$ (3)

The Company estimates less than $1 million of net derivative losses included in AOCI as of December 31, 2019 will be reclassified into earnings within the following 12 months. See Note 19, Changes in Accumulated Other Comprehensive Income (Loss) by Component for further information.

10. Fair Value of Financial Instruments

A three-level valuation hierarchy, based upon observable and unobservable inputs, is used for fair value measurements. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect market assumptions based on the best evidence available. A financial instrument's categorization within the hierarchy is based on the lowest level of input that is significant to the fair value measurement. The fair value hierarchy definition prioritizes the inputs used in measuring fair value into the following levels:

Level 1	—	Quoted prices in active markets for identical assets or liabilities.
Level 2	—	Inputs, other than quoted prices in active markets, that are observable either directly or indirectly.
Level 3	—	Unobservable inputs based on the Company's own assumptions.

Assets and Liabilities Measured at Fair Value on a Recurring Basis
The following table presents assets and liabilities included in the Company's consolidated balance sheets as of December 31, 2019 and 2018 that are recognized at fair value on a recurring basis, and indicate the fair value hierarchy utilized to determine such fair value:

	Fair value hierarchy	December 31, 2019 Carrying Amount	December 31, 2019 Fair Value	December 31, 2018 Carrying Amount	December 31, 2018 Fair Value
Derivative instruments:					
Equity swap agreement	Level 2	$ (1)	$ (1)	$ 4	$ 4
Commodity contracts	Level 2	$ —	$ —	$ (2)	$ (2)

Asset and Liability Instruments — The carrying value of cash and cash equivalents, restricted cash, short and long-term receivables, accounts payable, and short-term debt approximates fair value.

Cash-Settled Share Swap Transactions — The Company's stock price is used as an observable input in determining the fair value of the equity swap. The fair value of the equity swap agreement is recorded in "Prepayments and other current assets" in the consolidated balance sheets.

Commodity Contracts and Foreign Currency Contracts — The Company calculates the fair value of its commodity contracts and foreign currency contracts using commodity forward rates and currency forward rates, to calculate forward values, and then discounts the forward values. The discount rates for all derivative contracts are based on bank deposit rates. The fair value of the Company's foreign currency forward contracts was a net asset position of less than $1 million at December 31, 2019 and 2018.

Assets and Liabilities Measured at Fair Value on a Nonrecurring Basis
In addition to items measured at fair value on a recurring basis, assets may be measured at fair value on a nonrecurring basis. These assets include long-lived assets and intangible assets which may be written down to fair value as a result of impairment. During the years ended December 31, 2019, 2018, and 2017 the Company recorded goodwill and other indefinite lived asset impairment charges of $241 million, $3 million, and $11 million. See Note 7, Goodwill and Other Intangible Assets for further discussion of the valuation methodologies and related inputs, which are Company-specific, as observable inputs are not available (level 3).

Financial Instruments Not Carried at Fair Value
Estimated fair values of the Company's outstanding debt were:

	Fair value hierarchy	December 31, 2019 Carrying Amount	December 31, 2019 Fair Value	December 31, 2018 Carrying Amount	December 31, 2018 Fair Value
Long-term debt (including current maturities):					
Term loans and senior notes	Level 2	$ 5,179	$ 5,113	$ 5,307	$ 5,218

The fair value of the Company's public senior notes and private borrowings under its senior credit facility is based on observable inputs, and its borrowings on the revolving credit facility approximate fair value. The Company also had $192 million and $172 million in other debt whose carrying value approximates fair value, which consists primarily of foreign debt with maturities of one year or less, at December 31, 2019 and 2018.

11. Debt and Other Financing Arrangements

Long-Term Debt

A summary of the Company's long-term debt obligations at December 31, 2019 and 2018, is set forth in the following table:

	2019			2018		
	Principal	Carrying Amount[(a)]	Effective Interest Rate	Principal	Carrying Amount[(a)]	Effective Interest Rate
Credit Facilities						
Revolver Borrowings						
Due 2023	$ 183	$ 183	3.374%	$ —	$ —	—%
Term Loans						
LIBOR plus 1.75% Term Loan A due 2019 through 2023[(b)]	1,615	1,608	3.665%	1,700	1,691	4.410%
LIBOR plus 3.00% Term Loan B due 2019 through 2025[(c)]	1,683	1,623	5.557%	1,700	1,629	6.130%
Senior Unsecured Notes						
$225 million of 5.375% Senior Notes due 2024[(d)]	225	222	5.609%	225	222	5.609%
$500 million of 5.000% Senior Notes due 2026[(e)]	500	494	5.219%	500	493	5.219%
Senior Secured Notes [(i)]						
€415 million 4.875% Euro Fixed Rate Notes due 2022[(f)]	465	479	3.599%	476	496	3.599%
€300 million of Euribor plus 4.875% Euro Floating Rate Notes due 2024[(g)]	336	340	4.620%	344	349	4.620%
€350 million of 5.000% Euro Fixed Rate Notes due 2024[(h)]	392	413	3.823%	401	427	3.823%
Other debt, primarily foreign instruments[(j)]	14	13		46	44	
		5,375			5,351	
Less - maturities classified as current[(j)]		4			11	
Total long-term debt		$ 5,371			$ 5,340	

[(a)] Carrying amount is net of unamortized debt issuance costs and debt discounts or premiums. Total unamortized debt issuance costs were $76 million and $90 million as of December 31, 2019 and 2018. Total unamortized debt issuance costs related to the revolver were $17 million and $22 million as of December 31, 2019 and 2018. Total unamortized debt (premium) discount, net was $(37) million and $(49) million as of December 31, 2019 and 2018.
[(b)] Principal and interest payable in 19 consecutive quarterly installments beginning March 31, 2019. As of December 31, 2019, principal and interest is payable in 15 remaining quarterly installments with $21 million being paid quarterly in the first four quarters, followed by $32 million paid in the subsequent four quarters followed by $43 million in the subsequent seven quarters and the remainder at maturity.
[(c)] Principal and interest payable in 27 consecutive quarterly installments of $4 million beginning March 31, 2019 and the remainder at maturity.
[(d)] Interest payable semiannually beginning on June 30, 2015 with principal due at maturity.
[(e)] Interest payable semiannually beginning on January 31, 2017 with principal due at maturity.
[(f)] Interest is payable semiannually on April 15 and October 15 of each year with principal due at maturity.
[(g)] Interest accrues at the three-month EURIBOR rate (with 0% floor) plus 4.875% per annum and payable quarterly on January 15, April 15, July 15 and October 15.
[(h)] Interest payable semiannually on January 15 and July 15 of each year beginning on July 17, 2017 with principal due at maturity.
[(i)] Rank equally in right of payment to all indebtedness under the New Credit Facility (as subsequently defined).
[(j)] The prior year amount has been updated from the prior year disclosure.

The Company has excluded the required payments, due within the next twelve months, under the Term Loan A and Term Loan B facilities totaling $85 million and $17 million from current liabilities as of December 31, 2019, because the Company has the intent and ability to refinance the obligations on a long-term basis by using its revolving credit facility.

The aggregate maturities applicable to the long-term debt outstanding at December 31, 2019:

	Aggregate Maturities
2020	$ 106
2021	$ 145
2022	$ 652
2023	$ 1,432
2024	$ 970

Interest expense associated with the amortization of the debt issuance costs and original issue discounts recognized in the Company's consolidated statements of income (loss) consists of the following:

	2019	2018	2017
Amortization of debt issuance fees	$ 18	$ 8	$ 4

Included in the table above is the amortization of debt issuance costs on the revolver. These are $5 million at December 31, 2019 and are recorded in other assets. As a result of the Federal-Mogul Acquisition, the Senior Secured Notes listed in the table were acquired at fair value, which resulted in recognizing a debt premium of $54 million on these notes, of which $13 million and $3 million was accreted to interest income during the years ended December 31, 2019 and 2018.

Short-Term Debt
The Company's short-term debt as of December 31, 2019 and 2018 is as follows:

	At December 31	
	2019	2018
Maturities classified as current [b]	$ 4	$ 11
Short-term borrowings[a][b]	179	128
Bank overdrafts	2	14
Total short-term debt	$ 185	$ 153
Weighted average interest rate on outstanding short-term borrowings at end of year	4.3%	4.4%

[a] Includes borrowings under both committed credit facilities and uncommitted lines of credit and similar arrangements.
[b] The prior year amount has been updated from the prior year disclosure.

Credit Facilities
Financing Arrangements

	Committed Credit Facilities[a] as of December 31, 2019				
	Term	Commitments	Borrowings	Letters of Credit[b]	Available
Tenneco Inc. revolving credit agreement	2023	$ 1,500	$ 183	$ —	$ 1,317
Tenneco Inc. Term Loan A	2023	1,615	1,615	—	—
Tenneco Inc. Term Loan B	2025	1,683	1,683	—	—
Subsidiaries' credit agreements	2020-2028	168	159	—	9
		$ 4,966	$ 3,640	$ —	$ 1,326

[a] The Company generally is required to pay commitment fees on the unused portion of the total commitment.
[b] Letters of credit reduce the available borrowings under the revolving credit agreement.

The Company also has $60 million of outstanding letters of credit under uncommitted facilities at December 31, 2019.

Term Loans
On October 1, 2018, the Company entered into a new credit agreement with JPMorgan Chase Bank, N.A., as administrative agent and other lenders (the " New Credit Facility") in connection with the Federal-Mogul Acquisition, which has been amended by the first amendment, dated February 14, 2020 (the "First Amendment"), and by the second amendment, dated February 14, 2020 (the "Second Amendment"). The New Credit Facility consists of $4.9 billion of total debt financing, consisting of a five-year $1.5 billion revolving credit facility, a five-year $1.7 billion term loan A facility ("Term Loan A") and a seven-year $1.7 billion term loan B facility ("Term Loan B"). The Company paid $8 million in one-time fees in connection with the First Amendment and the Second Amendment.

Proceeds from the New Credit Facility were used to finance the cash consideration portion of the Federal-Mogul Acquisition purchase price, to refinance the Company's then existing senior credit facilities inclusive of the revolver and the tranche A term loan then outstanding (the "Old Credit Facility"), certain senior credit facilities of Federal-Mogul, and to pay fees and expenses relating to the acquisition and the financing thereof. The remainder, including future borrowings under the revolving credit facility, will be used for general corporate purposes.

The Company and Tenneco Automotive Operating Company Inc., a wholly-owned subsidiary, are borrowers under the New Credit Facility, and the Company is the sole borrower under the Term Loan A and Term Loan B facilities. The New Credit Facility is guaranteed on a senior basis by certain material domestic subsidiaries of the Company. Drawings under the revolving credit facility may be in U.S. dollars, British pounds or euros.

The New Credit Facility is secured by substantially all domestic assets of the Company, the subsidiary guarantors, and by pledges of up to 66% of the stock of certain first-tier foreign subsidiaries. The security for the New Credit Facility is pari passu with the security for the outstanding senior secured notes of Federal-Mogul that were assumed by the Company in connection with the acquisition. If any foreign subsidiary of the Company is added to the revolving credit facility as a borrower, the obligations of such foreign borrower will be secured by the assets of such foreign borrower, and also will be secured by the assets of, and guaranteed by, the domestic borrowers and domestic guarantors as well as certain foreign subsidiaries of the Company in the chain of ownership of such foreign borrower.

As a result of the refinancing of the revolving credit agreement and tranche A term loan under the Old Credit Facility, the Company recorded a loss on extinguishment of debt of $10 million for the year ended December 31, 2018, primarily consisting of debt issuance costs incurred at the transaction date and write-off of deferred debt issuance costs related to the refinanced revolving credit loan and tranche A term loan. The Company also recorded $1 million of loss on extinguishment of debt for the year ended December 31, 2017 related to the amendment and restatement of the Old Credit Facility and the write off of deferred debt issuance costs related to the Old Credit Facility.

New Credit Facility — Interest Rates and Fees
At December 31, 2019, the interest rate on borrowings under the revolving credit facility and the Term Loan A facility was LIBOR plus 1.75%, and would change to 1.50% if the Company's consolidated net leverage ratio were less than 2.5 to 1 and greater than or equal to 1.5 to 1, and would have changed to 1.25% if the net leverage ratio were less than 1.5 to 1. After giving effect to the First Amendment, the interest rate on borrowings under the revolving credit facility and the Term Loan A facility increased from LIBOR plus 1.75% to LIBOR to LIBOR plus 2.00% and will remain at LIBOR plus 2.00% for each relevant period for which the Company's consolidated net leverage ratio (as defined by the New Credit Facility) is equal to or greater than 3.0 to 1. The First Amendment does not change the step-down of the interest rate at lower consolidated net leverage ratios, which steps down to (a) LIBOR plus 1.75% if the Company's consolidated net leverage ratio is less than 3.0 to 1 and greater than 2.5 to 1; (b) LIBOR plus 1.50% if the Company's consolidated net leverage ratio is less than 2.5 to 1 and greater than 1.5 to 1; and (c) LIBOR plus 1.25% if the net leverage ratio is less than 1.5 to 1.

Initially, and so long as the Company's corporate family rating is Ba3 (with a stable outlook) or higher from Moody's Investors Service, Inc. ("Moody's") and BB- (with a stable outlook) or higher from Standard & Poor's Financial Services LLC ("S&P"), the interest rate on borrowings under the Term Loan B facility will be LIBOR plus 2.75%; at any time the foregoing conditions are not satisfied, the interest rate on the Term Loan B facility will be LIBOR plus 3.00%. When the Term Loan B facility is no longer outstanding and the Company and its subsidiaries have no other secured indebtedness (with certain exceptions set forth in the New Credit Facility), and upon the Company achieving and maintaining two or more corporate credit and/or corporate family ratings higher than or equal to BBB- from S&P, BBB- from Fitch Ratings Inc. ("Fitch") and/or Baa3 from Moody's (in each case, with a stable or positive outlook), the collateral under the New Credit Facility may be released. On June 3, 2019, Moody's lowered our corporate family rating to B1 and the interest rate on borrowings under the term loan B was raised to LIBOR plus 3.00%.

New Credit Facility — Other Terms and Conditions
The New Credit Facility contains representations and warranties, and covenants which are customary for debt facilities of this type. The covenants limit the ability of the Company and its restricted subsidiaries to, among other things, (i) incur additional indebtedness or issue preferred stock; (ii) pay dividends or make distributions to the Company's stockholders; (iii) purchase or redeem the Company's equity interests; (iv) make investments; (v) create liens on its assets; (vi) enter into transactions with the Company's affiliates; (vii) sell assets; and (viii) merge or consolidate with, or dispose of substantially all of the Company's assets to, other companies. The First Amendment further tightened the restrictions on the Company's ability to pay dividends and make distributions to its stockholders, to make investments and to increase the size of the revolving credit facility, the term loan A facility or the term Loan B facility. The Second Amendment provided greater flexibility for the Company to apply, at its discretion, the net cash proceeds from a spin-off of DRiV to prepay the senior secured notes, Term Loan A or Term Loan B (subject to the terms of the senior note indentures).

The New Credit Facility also contains two financial maintenance covenants for the revolving credit facility and the Term Loan A facility. At December 31, 2019, these financial maintenance covenants include (i) a requirement to have a consolidated net leverage ratio (as defined in the New Credit Facility) as of the end of each fiscal quarter of not greater than 4.0 to 1 through September 30, 2019, 3.75 to 1 through September 30, 2020 and 3.5 to 1 thereafter; and (ii) a requirement to maintain a consolidated interest coverage ratio (as defined in the New Credit Facility) for any period of four consecutive fiscal quarters of not less than 2.75 to 1. After giving effect to the First Amendment, these financial maintenance covenants include (i) a requirement to have a consolidated net leverage ratio (as defined in the New Credit Facility) as of the end of each fiscal quarter of not greater than 4.50 to 1 through March 31, 2021, 4.25 to 1 through September 30, 2021, 4.00 to 1 through March 31, 2022, 3.75 to 1 through September 30, 2022, and 3.5 to 1 thereafter; and (ii) a requirement to maintain a consolidated interest coverage ratio (as defined in the New Credit Facility) for any period of four consecutive fiscal quarters of not less than 2.75 to 1.

The covenants in the New Credit Facility generally prohibit the Company from repaying or refinancing certain subordinated indebtedness. So long as no default exists, the Company would, under its New Credit Facility, be permitted to repay or refinance its subordinated indebtedness (i) with the net cash proceeds of permitted refinancing indebtedness (as defined in the New Credit Facility); (ii) in an amount equal to the net cash proceeds of qualified capital stock (as defined in the New Credit Facility) issued after October 1, 2018; (iii) in exchange for qualified capital stock issued after October 1, 2018; and (iv) with additional payments provided that such additional payments are capped based on a pro forma consolidated leverage ratio after giving effect to such additional payments.

After giving effect to the First Amendment, such additional payments on subordinated indebtedness (x) will no longer be permitted at any time the pro forma consolidated leverage ratio is greater than 2.00 to 1 after giving effect to such additional payments and (y) will be permitted in an unlimited amount at any time the pro forma consolidated leverage ratio is equal to or less than 2.00 to 1 after giving effect to such additional payments.

The New Credit Facility includes customary events of default and other provisions that could require all amounts due thereunder to become immediately due and payable, either automatically or at the option of the lenders, if the Company fails to comply with the terms of the New Credit Facility or if other customary events occur.

At December 31, 2019, the Company was in compliance with all the financial covenants of the New Credit Facility.

Senior Notes

Senior Unsecured Notes

At December 31, 2019, the Company has outstanding 5.375% senior unsecured notes due December 15, 2024 ("2024 Senior Notes") and 5.000% senior unsecured notes due July 15, 2026 ("2026 Senior Notes" and together with the 2024 Senior Notes, the "Senior Unsecured Notes"). Under the indentures covering the Senior Unsecured Notes, the Company is permitted to redeem some or all of the outstanding Senior Unsecured Notes, at specified redemption prices that decline to par over a specified period, at any time (a) on or after December 15, 2019, in the case of the 2024 Senior Notes and (b) on or after July 15, 2021, in the case of the 2026 Senior Notes. In addition, the Senior Unsecured Notes may also be redeemed at any time at a redemption price generally equal to 100% of the principal amount thereof plus a "make-whole premium" as set forth in the indentures. The Company did not redeem any of the Senior Unsecured Notes during the year ended December 31, 2019.

If the Company experiences specified kinds of changes in control, the Company must offer to repurchase the Senior Unsecured Notes at 101% of the principal amount thereof plus accrued and unpaid interest. In addition, if the Company sells certain of its assets and does not apply the proceeds from the sale in a certain manner within 365 days of the sale, the Company must use such unapplied sales proceeds to make an offer to repurchase the 2024 Senior Notes at 100% of the principal amount thereof plus accrued and unpaid interest.

Senior Secured Notes

In connection with the Federal-Mogul Acquisition, the Company assumed (i) €350 million aggregate principle amount of 5.000% euro denominated senior secured fixed rate notes which are due July 15, 2024 ("5.000% Euro Fixed Rate Notes"), (ii) €415 million aggregate principal amount of 4.875% euro denominated senior secured fixed rate notes due April 15, 2022 ("4.875% Euro Fixed Rate Notes"), and (iii) €300 million aggregate principal amount of floating rate senior secured notes due April 15, 2024 ("Euro Floating Rate Notes" and together with the 5.000% Euro Fixed Rate Notes and the 4.875% Euro Fixed Rate Notes, the "Senior Secured Notes") which were outstanding at December 31, 2019. The Senior Secured Notes are secured equally and ratably by a pledge of substantially all the Company's subsidiaries' domestic assets and by pledges of up to 66% of the stock of certain first-tier foreign subsidiaries. The security for the Senior Secured Notes is pari passu with the security for the New Credit Facility.

The Company is permitted to redeem some or all of the outstanding Senior Secured Notes at specified redemption prices that decline to par over a specified period, at any time (a) on or after July 15, 2020, in the case of the 5.000% Euro Fixed Rate Notes, (b) on or after April 15, 2019, in the case of the 4.875% Euro Fixed Rate Notes and (c) on or after April 15, 2018, in the case of the Euro Floating Rate Notes. Prior to July 15, 2020, the Company may also redeem the 5.00% Euro Fixed Rate Notes at any time at a redemption price equal to 100% of the principal amount thereof plus a "make-whole premium" as set forth in the indenture. Further, the Company may also redeem up to 40% of the 5.000% Euro Fixed Rate Notes with the proceeds of certain equity offerings at any time prior to July 15, 2020 at a redemption price equal to 105.0% of the principal amount thereto.

If the Company experiences specified kinds of changes in control, the Company must offer to repurchase the Senior Secured Notes at 101% of the principal amount thereof plus accrued and unpaid interest. In addition, if the Company sells certain of its assets and does not apply the proceeds from the sale in a certain manner within 365 days of the sale, the Company must use such unapplied proceeds to make an offer to repurchase the Senior Secured Notes at 100% of the principal amount thereof plus accrued and unpaid interest.

The Company has designated a portion of the Senior Secured Notes as a net investment hedge of its European operations. As such, the fluctuations in foreign currency exchange rates on the value of the designated Senior Secured Notes is recorded to cumulative translation adjustment. See Note 9, Derivatives and Hedging Activities for further details.

Senior Unsecured Notes and Senior Secured Notes - Other Terms and Conditions
The Senior Unsecured Notes and Senior Secured Notes contain covenants that will, among other things, limit the ability of the Company and its subsidiaries to create liens on their assets and enter into sale and leaseback transactions. In addition, the indentures governing the Senior Secured Notes and 2024 Unsecured Senior Notes contain covenants that restrict the ability of the Company and its subsidiaries to: (i) incur additional indebtedness; (ii) pay dividends or make other distributions to the holders of the Company's capital stock; (iii) repurchase the Company's capital stock; (iv) make investments; (v) sell assets; and (vi) undertake mergers and consolidations.

Subject to limited exceptions, all of the Company's existing and future material domestic wholly owned subsidiaries fully and unconditionally guarantee its Senior Unsecured Notes and Senior Secured Notes on a joint and several basis. There are no significant restrictions on the ability of the subsidiaries that have guaranteed the Company's Senior Notes to make distributions to the Company.

Other Debt
Other debt consists primarily of subsidiary debt.

Accounts Receivable Securitization and Factoring
On-Balance Sheet Arrangements
The Company has securitization programs for some of its accounts receivable, with limited recourse provisions. Borrowings on these securitization programs are recorded in short-term debt.

Borrowings on these securitization programs at December 31, 2019 and 2018 are as follows:

	At December 31	
	2019	2018
Borrowings on securitization programs	$ 4	$ 6

Off-Balance Sheet Arrangements
In the Company's European and U.S. accounts receivable factoring programs, accounts receivables are transferred in their entirety to the acquiring entities and are accounted for as a sale. Due to the Federal-Mogul Acquisition, additional factoring arrangements in the U.S. and Europe were acquired which are also accounted for as a sale and have been included in the tables below. The fair value of assets received as proceeds in exchange for the transfer of accounts receivable under these factoring programs approximates the fair value of such receivables. Certain programs in Europe have deferred purchase price arrangements with the banks.

The Company is the servicer of the receivables under some of these arrangements and is responsible for performing all accounts receivable administration functions. Where the Company receives a fee to service and monitor these transferred accounts receivables, such fees are sufficient to offset the costs and as such, a servicing asset or liability is not recorded as a result of such activities.

In the U.S and Canada, the Company participates in supply chain financing programs with certain of the Company's aftermarket customers through a drafting program.

The amount of accounts receivable outstanding and derecognized for these factoring and drafting arrangements was $1.0 billion and $1.0 billion as of December 31, 2019 and 2018. In addition, the outstanding deferred purchase price receivable was $33 million and $24 million as of December 31, 2019 and 2018.

Proceeds from the factoring of accounts receivable qualifying as sales and drafting programs was $5.0 billion, $3.4 billion, and $2.0 billion for the years ended December 31, 2019, 2018, and 2017.

Expenses associated with these arrangements for the years ended December 31, 2019, 2018, and 2017 are as follows:

	Year Ended December 31		
	2019	2018	2017
Loss on sale of receivables [a]	$ 31	$ 16	$ 5

[a] Included in interest expense within the consolidated statements of income (loss).

If the Company were not able to factor receivables or sell drafts under either of these programs, its borrowings under its revolving credit agreement might increase. These programs provide the Company with access to cash at costs that are generally favorable to alternative sources of financing and allow the Company to reduce borrowings under its revolving credit agreement.

12. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities at December 31, 2019 and 2018 included the following:

	December 31	
	2019	2018
Accrued rebates	$ 190	$ 189
Product return reserves	83	95
Restructuring liabilities	97	91
Legal reserves	38	71
Non-income tax payable	73	67
Pension and postretirement benefits liability	46	50
Accrued freight	52	48
Liabilities held for sale	6	39
Accrued warranty	43	39
Accrued interest	29	33
Accrued professional services	32	31
Environmental reserve	8	12
Operating lease liability	96	—
Other	277	236
	$ 1,070	$ 1,001

13. Pension Plans, Postretirement and Other Employee Benefits

Defined Contribution Plans

The Company sponsors defined contribution plans that provide Company matching contributions for eligible U.S. salaried and hourly employees. Contributions are also made to certain non-U.S. defined contribution plans. The Company recorded expense for these defined contribution plans of approximately $76 million, $43 million, and $29 million for the years ended December 31, 2019, 2018 and 2017.

Defined Benefit Plans

The Company sponsors defined benefit pension plans and health care and life insurance benefits for certain employees and retirees around the world. There are also unfunded nonqualified pension plans primarily covering U.S. executives, which are frozen with respect to future benefit accruals. The funding policy for defined benefit pension plans is to contribute the minimum required by applicable laws and regulations or to directly pay benefit payments where appropriate. At December 31, 2019, all legal funding requirements had been met. The Company expects to contribute $49 million to its U.S. pension plans, $43 million to its non-U.S. pension plans, and $25 million to its other postretirement plans in 2020.

Other Benefits
The Company also provides benefits to former or inactive employees paid after employment but before retirement. The liabilities for these postemployment benefits were $73 million and $75 million at December 31, 2019 and 2018.

Significant Events
In December 2019, the Company approved an amendment for one of its U.S. postretirement benefit plans that eliminated health care and life insurance benefits in retirement for active salaried and nonunion hourly employees if benefits are not commenced by the earlier of (i) one-year from the date of separation, or (ii) July 1, 2021. In addition, the Company approved an amendment for another of its U.S. postretirement benefit plans to eliminate health care benefits for certain retirees. These actions reduced the Company's obligations by $17 million with a corresponding increase of $13 million to AOCI (net of taxes of $4 million) at December 31, 2019 and a non-cash curtailment gain of $7 million for the year ended December 31, 2019. The $17 million is being amortized on a straight-line basis as a reduction to net periodic postretirement benefit cost over participants' average remaining service periods or remaining life expectancy.

During 2019, the Company also offered a voluntary lump sum window for one of its U.S. defined benefit pension plans to terminated vested participants that met certain eligibility criteria. These benefits were paid in December 2019 out of the pension plan assets and resulted in a non-cash settlement charge of $5 million for the year ended December 31, 2019.

In December 2018, the Company approved an amendment for one of its U.S. postretirement health care benefit plans. Beginning June 1, 2019, eligible retirees that opt to receive benefits will receive a fixed subsidiary payment to purchase health care benefits on a marketplace exchange in lieu of the original plan's medical benefits. The amendments to the plan resulted in a plan remeasurement and recognition of a negative plan amendment, which reduced the Company's obligation by $66 million with a corresponding increase of $50 million in AOCI (net of taxes of $16 million) as of December 31, 2018. The $66 million is being amortized on a straight-line basis as a reduction to net periodic postretirement benefit cost over participants' average remaining service periods or remaining life expectancy.

As a result of the Federal-Mogul Acquisition, the Company assumed $848 million in underfunded defined benefit pension and other postretirement benefit obligations.

In February 2016, the Company launched a voluntary program to buy out active employees and retirees who had earned benefits in the U.S. pension plans. As of December 31, 2016, this program had been substantially completed with cash payments to those who elected to take the buyout made from pension plan assets in the fourth quarter of 2016. In connection with this program the Company contributed $18 million into the pension trust and recognized a non-cash charge of $72 million. The program was completed in the first quarter of 2017, at which time the Company contributed another $10 million and recognize a non-cash charge of $6 million during the year ended December 31, 2017.

The measurement date for all defined benefit plans is December 31. The following provides a reconciliation of the plans' benefit obligations, plan assets, and funded status as of December 31, 2019 and 2018:

	Pension Plans				Other Postretirement Benefits Plans	
	U.S.		Non-U.S.			
	2019	2018	2019	2018	2019	2018
Change in benefit obligation:						
Benefit obligation, beginning of year	$ 1,302	$ 263	$ 946	$ 471	$ 322	$ 151
Federal-Mogul acquisition	—	1,064	—	545	—	263
Service cost	2	1	24	13	1	—
Interest cost	53	21	24	15	13	8
Settlement	(67)	(1)	(5)	(13)	—	—
Curtailment	—	—	—	—	—	(1)
Administrative expenses/taxes paid	—	—	(4)	(3)	—	—
Plan amendments	—	—	—	2	(17)	(66)
Actuarial (gain)/loss	105	(12)	105	(16)	6	(24)
Benefits paid	(75)	(34)	(44)	(22)	(26)	(15)
Medicare subsidies received	—	—	—	—	—	1
Participants' contributions	—	—	1	1	1	1
Held for sale	—	—	—	(16)	—	—
Currency rate conversion and other	—	—	1	(31)	—	4
Benefit obligation, end of year	1,320	1,302	1,048	946	300	322
Change in plan assets:						
Fair value of plan assets, beginning of year	995	202	466	438	—	—
Federal-Mogul acquisition	—	943	—	81	—	—
Settlement	(67)	(1)	(5)	(14)	—	—
Actual return on plan assets	183	(122)	55	(1)	—	—
Administrative expenses/taxes paid	—	—	(4)	—	—	—
Employer contributions	26	6	42	21	25	13
Medicare subsidies received	—	—	—	—	—	1
Participants' contributions	—	—	1	1	1	1
Benefits paid	(75)	(33)	(44)	(25)	(26)	(15)
Held for sale				(10)	—	—
Currency rate conversion and other	—	—	12	(25)	—	—
Fair value of plan assets, end of year	1,062	995	523	466	—	—
Funded status of the plans	$ (258)	$ (307)	$ (525)	$ (480)	$ (300)	$ (322)

Amounts recognized on the consolidated balance sheets consist of the following at December 31, 2019 and 2018:

	Pension Plans				Other Postretirement Benefits Plans	
	U.S.		Non-U.S.			
	2019	2018	2019	2018	2019	2018
Noncurrent assets	$ —	$ —	$ 35	$ 33	$ —	$ —
Current liabilities	(4)	(5)	(17)	(17)	(25)	(28)
Noncurrent liabilities [a]	(254)	(302)	(543)	(496)	(275)	(294)
	$ (258)	$ (307)	$ (525)	$ (480)	$ (300)	$ (322)

[a] Included in "Pension and postretirement benefits" within in the consolidated balance sheets is postemployment benefits of $73 million and $75 million at December 31, 2019 and 2018 which are not included in the tables above.

Amounts recognized in accumulated other comprehensive loss for pension and postretirement benefits, inclusive of tax effects, consist of the following components at December 31, 2019 and 2018:

	Pension Plans								Other Postretirement Benefits Plans			
	U.S.				Non-U.S.							
	2019		2018		2019		2018		2019		2018	
Actuarial loss	$	230	$	255	$	145	$	80	$	34	$	31
Prior service cost/(credit)		—		—		3		4		(70)		(73)
Total	$	230	$	255	$	148	$	84	$	(36)	$	(42)

Information for defined benefit plans with projected benefit obligations in excess of plan assets:

	Pension Plans								Other Postretirement Benefits Plans			
	2019				2018							
	U.S.		Non-U.S.		U.S.		Non-U.S.		2019		2018	
Projected benefit obligation	$	1,320	$	712	$	1,302	$	652	$	300	$	322
Fair value of plan assets	$	1,062	$	151	$	995	$	138	$	—	$	—

Information for pension plans with accumulated benefit obligations in excess of plan assets:

	December 31, 2019				December 31, 2018			
	U.S.		Non-U.S.		U.S.		Non-U.S.	
Projected benefit obligation	$	1,320	$	682	$	1,302	$	620
Accumulated benefit obligation	$	1,320	$	637	$	1,302	$	606
Fair value of plan assets	$	1,062	$	126	$	995	$	111

The accumulated benefit obligation for all pension plans is $2,315 million and $2,225 million at December 31, 2019 and 2018.

Net periodic pension and postretirement benefits costs for the years 2019, 2018 and 2017, consist of the following components:

	Pension Plans												Other Postretirement Benefits Plans					
	U.S.						Non-U.S.											
	2019		2018		2017		2019		2018		2017		2019		2018		2017	
Service cost	$	2	$	1	$	1	$	24	$	14	$	9	$	1	$	—	$	—
Interest cost		53		21		10		24		15		13		13		8		5
Expected return on plan assets		(67)		(28)		(14)		(19)		(18)		(25)		—		—		—
Curtailment loss (gain)		—		—		—		—		—		—		(7)		1		—
Settlement loss		6		1		8		1		3		1		—		—		—
Net amortization:																		
Actuarial loss		5		5		5		5		6		9		4		5		4
Prior service cost (credit)		—		—		—		1		1		1		(8)		—		(1)
Net periodic costs	$	(1)	$	—	$	10	$	36	$	21	$	8	$	3	$	14	$	8

The following assumptions were used in the accounting for the pension and other postretirement benefits plans for the years of 2019, 2018, and 2017:

	Pension Plans						Other Postretirement Benefits Plans		
	U.S.			Non-U.S.					
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Weighted-average assumptions used to determine benefit obligations:									
Discount rate	3.2%	4.2%	3.8%	1.7%	2.6%	2.6%	3.2%	4.3%	3.8%
Rate of compensation increase	n/a	n/a	n/a	2.0%	3.0%	2.5%	n/a	n/a	n/a
Weighted-average assumptions used to determine net periodic benefit cost:									
Discount rate	4.2%	4.1%	4.2%	2.6%	2.4%	2.8%	4.3%	4.2%	4.2%
Expected long-term return on plan assets	6.3%	6.0%	7.8%	4.0%	4.2%	5.2%	n/a	n/a	n/a
Rate of compensation increase	n/a	n/a	n/a	2.0%	2.9%	2.5%	n/a	n/a	n/a

Estimated amounts to be amortized from accumulated other comprehensive loss into net periodic benefit cost in the year ending December 31, 2020 based on December 31, 2019 plan measurements:

	2020		
	Pension Plans		Other Postretirement Benefits Plans
	U.S.	Non-U.S	
Net actuarial loss	$ 6	$ 9	$ 2
Prior service (credit)	—	—	(9)
	$ 6	$ 9	$ (7)

Estimated future benefit payments are as follows:

	Pension Plans		Other Postretirement Benefits Plans
Year	U.S.	Non-U.S.	
2020	$ 97	$ 44	$ 25
2021	$ 95	$ 44	$ 25
2022	$ 98	$ 46	$ 24
2023	$ 97	$ 50	$ 24
2024	$ 96	$ 48	$ 23
2025-2029	$ 410	$ 251	$ 99

Health Care Trend

The weighted-average assumed health care cost trend rate used in determining next year's postretirement health care benefits are as follows:

	Other Postretirement Benefits Plans		
	2019	2018	2017
Initial health care cost trend rate	6.6%	6.9%	6.8%
Ultimate health care cost trend rate	4.9%	4.9%	4.5%
Year ultimate health care cost trend rate reached	2027	2027	2027

The assumed health care cost trend rate has a significant effect on the amounts reported for other postretirement benefits plans. The following table illustrates the sensitivity to a change in the assumed health care cost trend rate:

	Total Service and Interest Cost	Postretirement Benefits Obligation
100 basis point ("bp") increase in health care cost trend rate	$ —	$ 21
100 bp decrease in health care cost trend rate	$ (1)	$ (18)

Long-term Rate of Return
The Company's expected return on assets is established annually through analysis of anticipated future long-term investment performance for the plan based upon the asset allocation strategy and is primarily a long-term prospective rate.
An analysis was performed in December 2019 resulting in changes to the expected long-term rate of return on assets. The weighted-average long-term rate of return on assets for the U.S. pension plans was 6.3% at both December 31, 2019 and 2018. The expected long-term rate of return on plan assets used in determining pension expense for non-U.S. plans is determined in a similar manner to the U.S. plans and decreased from 4.0% at December 31, 2018 to 3.5% at December 31, 2019.

Plan Assets
Certain pension plans sponsored by the Company invest in a diversified portfolio consisting of an array of asset classes that attempts to maximize returns while minimizing volatility. These asset classes include developed market equities, emerging market equities, private equity, global high quality and high yield fixed income, real estate, and absolute return strategies.

U.S. Plans: The U.S. investment strategy mitigates risk by incorporating diversification across appropriate asset classes to meet the plans' objectives. It is intended to reduce risk, provide long-term financial stability for the plan, and maintain funded levels that meet long-term plan obligations while preserving sufficient liquidity for near-term benefit payments. Risk assumed is considered appropriate for the return anticipated and consistent with the diversification of plan assets. Approximately 51% of the U.S. plan assets were invested in actively managed investment funds. The Company's investment strategy includes a target asset allocation of 55% equity investments, 20% fixed income investments, 5% debt securities, and 20% in other investment types including hedge funds.

Non-U.S. Plans: The Company's non-U.S. plans are individually managed to different target levels depending on the investing environment in each country and the funded status of each plan, with a reduction in the allocation of assets to equity and fixed income securities at higher funded ratios. The insurance contracts guarantee a minimum rate of return. The Company has no input into the investment strategy of the assets underlying the contracts, but they are typically heavily invested in active bond markets and are highly regulated by local law.

Pension plan assets were invested in the following classes of securities:

	Percentage of Fair Market Value	
	December 31, 2019	
	U.S.	Non-U.S.
Equity securities	66%	32%
Fixed income securities	15%	5%
Debt securities	10%	43%
Insurance contracts	—%	15%
Other	9%	5%

The assets of some of the Company's pension plans are invested in trusts that permit commingling of the assets of more than one employee benefit plan for investment and administrative purposes. Each of the plans participating in the trust has interests in the net assets of the underlying investment pools.

The following table presents the Company's defined benefit plan assets measured at fair value by asset class:

	Fair Value Level as of December 31, 2019							
	U.S.				Non-U.S.			
Asset Category	**Level 1**	**Level 2**	**Level 3**	**Total**	**Level 1**	**Level 2**	**Level 3**	**Total**
Investments with registered investment companies:								
Equity securities	$ 337	$ —	$ —	$ 337	$ 1	$ —	$ —	$ 1
Fixed income securities	158	—	—	158	23	—	—	23
Real estate and other	38	—	—	38	—	—	—	—
Equity securities	238	—	—	238	18	58	—	76
Debt securities:								
Corporate and other		21	—	21	6	—	—	6
Government	12	21	—	33	5	166	—	171
Real Estate and other	—	—	—	—	3	10	—	13
Insurance contracts	—	—	—	—	—	—	80	80
Hedge funds	—	—	21	21	—	—	—	—
Cash and equivalents	34	—	—	34	14	—	—	14
Total	$ 817	$ 42	$ 21	$ 880	$ 70	$ 234	$ 80	$ 384
Plan assets measured at net asset value								
Equity securities				$ 128				$ 92
Government debt securities				—				33
Corporate and other debt securities				54				14
Total plan assets measured at net asset value				182				139
Net plan assets				$ 1,062				$ 523

	Fair Value Level as of December 31, 2018							
	U.S.				Non-U.S.			
Asset Category	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Investments with registered investment companies:								
Equity securities	$ 323	$ —	$ —	$ 323	$ 1	$ —	$ —	$ 1
Fixed income securities	167	—	—	167	21	—	—	21
Real estate and other	41	—	—	41	—	—	—	—
Equity securities	194	—	—	194	14	55	—	69
Debt securities:								
Corporate and other	—	18	—	18	8	—	—	8
Government	12	21	—	33	2	147	—	149
Real Estate and other	—	—	—	—	1	4	—	5
Insurance contracts	—	—	—	—	—	—	71	71
Hedge funds	—	—	28	28	—	—	—	—
Cash and equivalents	33	—	—	33	17	—	—	17
Total	$ 770	$ 39	$ 28	$ 837	$ 64	$ 206	$ 71	$ 341
Plan assets measured at net asset value								
Equity securities				$ 104				$ 81
Government debt securities				—				30
Corporate and other debt securities				54				14
Total plan assets measured at net asset value				158				125
Net plan assets				$ 995				$ 466

The Company's level 1 assets were valued using market prices based on daily net asset value ("NAV") or prices available daily through a public stock exchange. Its level 2 assets were valued primarily using market prices, sometimes net of estimated realization expenses, and based on broker/dealer markets or in commingled funds where NAV is not available daily or publicly. For insurance contracts, the estimated surrender value of the policy was used to estimate fair market value.

The table below summarizes the changes in the fair value of the Level 3 assets:

	December 31, 2019		December 31, 2018	
	Level 3 Assets		Level 3 Assets	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Balance at beginning of period	$ 28	$ 71	$ —	$ 9
Net realized/unrealized gains (loss)	2	7	(2)	1
Purchases and settlements, net	8	24	—	—
Sales, net	(17)	(20)	—	—
Transfers into (out) of Level 3	—	—	—	15
Acquisitions	—	—	30	56
Held for sale	—	—	—	(10)
Foreign exchange	—	(2)	—	—
Balance at end of period	$ 21	$ 80	$ 28	$ 71

The following table contains information about significant concentrations of risk, including all individual assets that make up more than 5% of the total assets and any direct investments in Tenneco stock:

Asset Category	Fair Value Level	Fair Value	Percentage of Total Assets
2019:			
Tenneco stock	1	$ 5	0.3%
2018:			
Tenneco stock	1	$ 10	0.7%

14. Income Taxes

The domestic and foreign components of the Company's earnings before income taxes and noncontrolling interests are as follows:

	Year Ended December 31		
	2019	2018	2017
U.S. income earnings (loss) before income taxes	$ (599)	$ (138)	$ (28)
Foreign earnings (loss) before income taxes	398	312	364
Earnings (loss) before income taxes and noncontrolling interests	$ (201)	$ 174	$ 336

The following table is a comparative analysis of the components of income tax expense (benefit):

	Year Ended December 31		
	2019	2018	2017
Current —			
U.S. federal	$ 8	$ 8	$ (23)
State and local	1	1	1
Foreign	161	119	101
	170	128	79
Deferred —			
U.S. federal	(101)	(35)	16
State and local	(13)	(5)	(3)
Foreign	(37)	(25)	(21)
	(151)	(65)	(8)
Income tax expense (benefit)	$ 19	$ 63	$ 71

The following table is a reconciliation of income taxes computed at the statutory U.S. federal income tax rate (21% for 2019 and 2018 and 35% for 2017) to the income tax expense (benefit) reflected in the consolidated statements of income (loss):

	Year Ended December 31		
	2019	2018	2017
Income tax expense (benefit) computed at the statutory U.S. federal income tax rate	$ (42)	$ 37	$ 117
Increases (reductions) in income tax expense resulting from:			
Foreign income taxed at different rates	8	19	(48)
Transition tax under Tax Cuts and Jobs Act ("TCJA")	—	11	43
Remeasurement of worldwide deferred taxes	—	—	53
State and local taxes on income, net of U.S. federal income tax benefit	(14)	(6)	(2)
Changes in valuation allowance for tax loss carryforwards and credits	36	—	(1)
Investment and R&D tax credits	(19)	(12)	(6)
Foreign earnings subject to U.S. federal income tax	12	13	(74)
Non-deductible expenses	16	3	3
Goodwill impairment	22	—	—
Tax contingencies	(7)	1	(1)
Gains on transfers of subsidiaries	21	—	—
Nonconsolidated affiliates	(8)	(4)	
Other	(6)	1	(13)
Income tax expense (benefit)	$ 19	$ 63	$ 71

The Company reported income tax expense of $19 million, $63 million, and $71 million for the years ended December 31, 2019, 2018, and 2017. The tax expense recorded for the year ended December 31, 2019 included tax benefits of $33 million relating to a valuation allowance release for an entity in Spain. In addition, the Company recorded $22 million of tax expense relating to a goodwill impairment discussed in Note 7, Goodwill and Other Intangible Assets and $21 million of tax expense relating to gains on transfers of subsidiaries for entities in China and Luxembourg for the year ended December 31, 2019. The tax expense recorded for the year ended December 31, 2018 included tax benefits of $10 million relating to a valuation allowance release for entities in Australia and $11 million of tax expense for changes in the toll tax. The tax expense recorded for the year ended December 31, 2017 included a net tax benefit of $74 million primarily relating to the recognition of a U.S. tax benefit for foreign taxes.

On December 22, 2017, the TCJA was enacted into U.S. law, which, among other provisions, lowered the corporate income tax rate effective January 1, 2018 from 35% to 21%, and implemented significant changes with respect to U.S. tax treatment of earnings originating from outside the U.S. Many of the provisions of TCJA are subject to regulatory interpretation and U.S. state conforming enactments. The Internal Revenue Service (IRS) issued Notice 2018-26 on April 2, 2018 and issued proposed regulations under Section 965 on August 1, 2018, which provided additional guidance to assist taxpayers in computing the toll tax. Based on the new guidance, an $11 million discrete charge was recorded in income tax expense for the year ended December 31, 2018. The Company has completed its accounting for the tax effects of the enactment at December 31, 2018.

The components of the Company's net deferred tax assets were as follows:

	December 31	
	2019	2018
Deferred tax assets —		
Tax loss carryforwards:		
State	$ 18	$ 18
Foreign [a]	559	404
Tax credits	179	159
Postretirement benefits other than pensions	20	21
Pensions	158	158
Payroll accruals	23	24
Book over tax depreciation	91	68
Research expense capitalized for tax	72	30
Other accruals	167	133
Valuation allowance [a]	(762)	(554)
Total deferred tax assets	525	461
Deferred tax liabilities —		
Amortization of intangibles	24	82
Total deferred tax liabilities	24	82
Net deferred tax assets	$ 501	$ 379

[a] The prior year amount has been updated from the prior year disclosure.

State tax loss carryforwards have been presented net of uncertain tax positions that, if realized, would reduce tax loss carryforwards in both 2019 and 2018 by $2 million. Additionally, foreign tax loss carryforwards, have been presented net of uncertain tax positions that, if realized, would reduce tax loss carryforwards in 2019 and 2018 by $14 million and $68 million.

	At December 31	
	2019	2018
Consolidated Balance Sheets:		
Non-current portion — deferred tax asset	$ 607	$ 467
Non-current portion — deferred tax liability	(106)	(88)
Net deferred tax assets	$ 501	$ 379

The Company evaluates its deferred income taxes quarterly to determine if valuation allowances are required or should be adjusted. This assessment considers, among other matters, the nature, frequency and amount of recent losses, the duration of statutory carryforward periods, and tax planning strategies. In making such judgments, significant weight is given to evidence that can be objectively verified. If (i) recent operational improvements continue in foreign subsidiaries or (ii) certain restructuring steps are completed as part of the future spin of DRiV, the Company believes it is reasonably possible that sufficient positive evidence may be available to release all, or a portion, of its valuation allowance in the next twelve months.

As a result of the valuation allowances recorded of $762 million and $554 million at December 31, 2019 and 2018, the Company has potential tax assets that were not recognized on its consolidated balance sheets. These unrecognized tax assets resulted primarily from foreign tax loss carryforwards, foreign investment tax credits, foreign research and development credits, and U.S. state net operating losses ("NOLs") that are available to reduce future tax liabilities.

The Company's state NOLs expire in various tax years through 2040 or have unlimited carryforward potential. The Company's non-U.S. NOLs expire in various tax years through 2039 or have unlimited carryforward potential.

The Company does not provide for U.S. income taxes on unremitted earnings of foreign subsidiaries, except for the earnings of three of its China operations, two of its Korea operations, two of its India operations, and one of its Spain operations as its present intention is to reinvest the unremitted earnings in the Company's foreign operations. Unremitted earnings of foreign subsidiaries were approximately $2.2 billion at December 31, 2019 and the Company estimated the amount of U.S. and foreign income taxes that would be accrued or paid upon remittance of the assets that represent those unremitted earnings was $117 million.

A tax benefit from an uncertain tax position may be recognized when it is "more likely than not" that the position will be sustained upon examination, including resolutions of any related appeals or litigation processes, based on the technical merits.

A reconciliation of the Company's uncertain tax positions is as follows:

	2019	2018	2017
Uncertain tax positions —			
Balance at beginning of period	$ 224	$ 112	$ 111
Gross increases in tax positions due to acquisition	—	110	—
Gross increases in tax positions in current period	12	8	6
Gross increases in tax positions in prior period	4	7	2
Gross decreases in tax positions in prior period	(5)	(1)	(2)
Gross decreases — settlements	(12)	(2)	—
Gross decreases — statute of limitations expired	(8)	(10)	(5)
Balance at end of period	$ 215	$ 224	$ 112

Additional information surrounding the balance of uncertain tax positions recognized were the following:

	Years ended December 31		
	2019	2018	2017
Tax benefits, that if recognized, would affect the effective tax rate	$ 141	$ 134	$ 108
Income tax expense for accrued interest	$ 1	$ 2	$ —

The Company's liability for penalties and interest were as follows:

	At December 31	
	2019	2018
Accrued liability for penalties on uncertain tax positions	$ 4	$ 12
Accrued liability for interest on uncertain tax positions	$ 12	$ 11

The Company's uncertain tax position at December 31, 2019 and 2018 included exposures relating to the disallowance of deductions, global transfer pricing, and various other issues. The Company believes it is reasonably possible that a decrease of up to $32 million in unrecognized tax benefits related to the expiration of U.S. and foreign statute of limitations and the conclusion of income tax examinations may occur within the next twelve months.

The Company is subject to taxation in the U.S. and various state and foreign jurisdictions. As of December 31, 2019, the Company's tax years open to examination in primary jurisdictions are as follows:

	Open To Tax Year
United States	2003
Belgium	2017
Brazil	2015
China	2012
France	2009
Germany	2012
India	2000
Italy	2015
Mexico	2013
Poland	2014
Spain	2000
United Kingdom	2016

15. Commitments and Contingencies

Capital Commitments
The Company estimates expenditures aggregating to approximately $106 million will be required after December 31, 2019 to complete facilities and projects authorized at such date, and it has made substantial commitments in connection with these facilities and projects.

Environmental Matters
The Company is subject to a variety of environmental and pollution control laws and regulations in all jurisdictions in which it operates. The Company has been notified by the U.S. Environmental Protection Agency, other national environmental agencies, and various provincial and state agencies it may be a potentially responsible party ("PRP") under such laws for the cost of remediating hazardous substances pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") and other national and state or provincial environmental laws. PRP designation typically requires the funding of site investigations and subsequent remedial activities. Many of the sites that are likely to be the costliest to remediate are often current or former commercial waste disposal facilities to which numerous companies sent wastes. Despite the potential joint and several liability which might be imposed on the Company under CERCLA and some of the other laws pertaining to these sites, its share of the total waste sent to these sites generally has been small. The Company believes its exposure for liability at these sites is limited.

On a global basis, the Company has also identified certain other present and former properties at which it may be responsible for cleaning up or addressing environmental contamination, in some cases as a result of contractual commitments and/or federal or state environmental laws. The Company is actively seeking to resolve these actual and potential statutory, regulatory, and contractual obligations.

The Company expenses or capitalizes, as appropriate, expenditures for ongoing compliance with environmental regulations. As of December 31, 2019, the Company has an obligation to remediate or contribute towards the remediation of certain sites, including the sites discussed above at which it may be a PRP. The undiscounted value of the estimated remediation costs was $40 million as of December 31, 2019.

The Company maintains the aggregated estimated share of environmental remediation costs for all these sites on a discounted basis in the consolidated balance sheets as follows:

	December 31	
	2019	2018
Accrued expenses and other current liabilities	$ 8	$ 12
Deferred credits and other liabilities	28	28
	$ 36	$ 40

For those locations where the liability was discounted, the weighted average discount rate used was 1.3%.

The Company's expected payments of environmental remediation costs for non-indemnified locations are estimated to be:

	2020	2021	2022	2023	2024	2025 and thereafter
Expected payments	$ 7	$ 4	$ 3	$ 2	$ 2	$ 15

In addition to amounts described above, the Company estimates it will make expenditures for property, plant and equipment for environmental matters of approximately $15 million in 2021 and $17 million in 2022.

Based on information known to the Company from site investigations and the professional judgment of consultants, the Company has established reserves it believes are adequate for these costs. Although the Company believes these estimates of remediation costs are reasonable and are based on the latest available information, the costs are estimates, difficult to quantify based on the complexity of the issues, and are subject to change as more information becomes available about the extent of remediation required. At some sites, the Company expects other parties will contribute to the remediation costs. In addition, certain environmental statutes provide that the Company's liability could be joint and several, meaning that the Company could be required to pay amounts in excess of its share of remediation costs. The financial strength of the other PRPs at these sites has been considered, where appropriate, in the determination of the estimated liability. The Company does not believe any potential costs associated with its current status as a PRP, or as a liable party at the other locations referenced herein, will be material to its annual consolidated financial position, results of operations, or liquidity.

Antitrust Investigations and Litigation
On March 25, 2014, representatives of the European Commission (EC) were at Tenneco GmbH's Edenkoben, Germany administrative facility to gather information in connection with an ongoing global antitrust investigation concerning multiple automotive suppliers. On the same date, the Company also received a related subpoena from the U.S. Department of Justice ("DOJ").

On November 5, 2014, the DOJ granted conditional leniency to Tenneco, its subsidiaries and its 50% affiliates as of such date ("2014 Tenneco Entities") pursuant to an agreement the Company entered into under the Antitrust Division's Corporate Leniency Policy. This agreement provides important benefits to the 2014 Tenneco Entities in exchange for the Company's self-reporting of matters to the DOJ and its continuing full cooperation with the DOJ's resulting investigation. For example, the DOJ will not bring any criminal antitrust prosecution against the 2014 Tenneco Entities, nor seek any criminal fines or penalties, in connection with the matters the Company reported to the DOJ. Additionally, there are limits on the liability of the 2014 Tenneco Entities related to any follow-on civil antitrust litigation in the United States. The limits include single rather than treble damages, as well as relief from joint and several antitrust liability with other relevant civil antitrust action defendants. These limits are subject to the Company satisfying the DOJ and any court presiding over such follow-on civil litigation.

On April 27, 2017, the Company received notification from the EC that it has administratively closed its global antitrust inquiry regarding the production, assembly, and supply of complete exhaust systems. No charges against the Company or any other competitor were initiated at any time and the EC inquiry is now closed.

Certain other competition agencies are also investigating possible violations of antitrust laws relating to products supplied by the Company and its subsidiaries, including Federal-Mogul. The Company has cooperated and continues to cooperate fully with all of these antitrust investigations, and take other actions to minimize its potential exposure.

The Company and certain of its competitors are also currently defendants in civil putative class action litigation, and are subject to similar claims filed by other plaintiffs, in the United States and Canada. More related lawsuits may be filed, including in other jurisdictions. Plaintiffs in these cases generally allege that defendants have engaged in anticompetitive conduct, in violation of federal and state laws, relating to the sale of automotive exhaust systems or components thereof. Plaintiffs seek to recover, on behalf of themselves and various purported classes of purchasers, injunctive relief, damages and attorneys' fees. However, as explained above, because the DOJ granted conditional leniency to the 2014 Tenneco Entities, the Company's civil liability in U.S. follow-on actions with respect to these entities is limited to single damages and the Company will not be jointly and severally liable with the other defendants, provided that the Company has satisfied its obligations under the DOJ leniency agreement and approval is granted by the presiding court. Typically, exposure for follow-on actions in Canada is less than the exposure for U.S. follow-on actions.

Following the EC's decision to administratively close its antitrust inquiry into exhaust systems in 2017, receipt by the 2014 Tenneco Entities of conditional leniency from the DOJ and discussions during the third quarter of 2017 following the appointment of a special settlement master in the civil putative class action cases pending against the Company and/or certain of its competitors in the United States, the Company continues to vigorously defend itself and/or take actions to minimize its potential exposure to matters pertaining to the global antitrust investigation, including engaging in settlement discussions when it is in the best interests of the Company and its stockholders. For example, in October 2017, the Company settled an administrative action brought by Brazil's competition authority for an amount that was not material. In December 2018, the Company settled a separate administrative action brought by Brazil's competition authority against a Federal-Mogul subsidiary, also for an amount that was not material.

Additionally, in February 2018, the Company settled civil putative class action litigation in the United States brought by classes of direct purchasers, end-payors and auto dealers. No other classes of plaintiffs have brought claims against the Company in the United States. Based upon those earlier developments, including settlement discussions, the Company established a reserve of $132 million in its second quarter 2017 financial results for settlement costs that were probable, reasonably estimable, and expected to be necessary to resolve its antitrust matters globally, which primarily involves the resolution of civil suits and related claims. Of the $132 million reserve that was established, $79 million was paid through December 31, 2019. In connection with the resolution of certain claims, $9 million was released as a change in estimate from the reserve in the third quarter of 2019 and a payment of $30 million was made in the first quarter of 2020 from amounts that were included in the reserve. At December 31, 2019, the total remaining reserve was $44 million, of which $30 million was recorded in accrued expenses and other current liabilities and $14 million was recorded in deferred credits and other liabilities in the consolidated balance sheets. While the Company, including its Federal-Mogul subsidiaries, continues to cooperate with certain competition agencies investigating possible violations of antitrust laws relating to products supplied by the Company, and the Company may be subject to other civil lawsuits and/or related claims, no amount of this reserve is attributable to matters with the DOJ or the EC, and no such amount is expected based on current information.

The Company's reserve for its antitrust matters is based upon all currently available information and an assessment of the probability of events for those matters where the Company can make a reasonable estimate of the costs to resolve such outstanding matters. The Company's estimate involves significant judgment, given the number, variety and potential outcomes of actual and potential claims, the uncertainty of future rulings and approvals by a court or other authority, the behavior or incentives of adverse parties or regulatory authorities, and other factors outside of its control. As a result, the Company's reserve may change from time to time, and actual costs may vary. Although the ultimate outcome of any legal matter cannot be predicted with certainty, based on current information, the Company does not expect that any such change in the reserve will have a material adverse effect on the Company's annual consolidated financial position, results of operations or liquidity.

Other Legal Proceedings, Claims and Investigations
For many years the Company has been and continues to be subject to lawsuits initiated by claimants alleging health problems as a result of exposure to asbestos. The Company's current docket of active and inactive cases is less than 500 cases in the United States and less than 50 in Europe.

With respect to the claims filed in the United States, the substantial majority of the claims are related to alleged exposure to asbestos in the Company's line of Walker® exhaust automotive products although a significant number of those claims appear also to involve occupational exposures sustained in industries other than automotive. A small number of claims have been asserted against one of the Company's subsidiaries by railroad workers alleging exposure to asbestos products in railroad cars. The Company believes, based on scientific and other evidence, it is unlikely that U.S. claimants were exposed to asbestos by the Company's former products and that, in any event, they would not be at increased risk of asbestos-related disease based on their work with these products. Further, many of these cases involve numerous defendants. Additionally, in many cases the plaintiffs either do not specify any, or specify the jurisdictional minimum, dollar amount for damages.

With respect to the claims filed in Europe, the substantial majority relate to occupational exposure claims brought by current and former employees of Federal-Mogul facilities in France and amounts paid out were not material. A small number of occupational exposure claims have also been asserted against Federal-Mogul entities in Italy and Spain.

As major asbestos manufacturers and/or users continue to go out of business or file for bankruptcy, the Company may experience an increased number of these claims. The Company vigorously defends itself against these claims as part of its ordinary course of business. In future periods, the Company could be subject to cash costs or charges to earnings if any of these matters are resolved unfavorably to the Company. To date, with respect to claims that have proceeded sufficiently through the judicial process, the Company has regularly achieved favorable resolutions. Accordingly, the Company presently believes that these asbestos-related claims will not have a material adverse effect on the Company's annual consolidated financial position, results of operations or liquidity.

In connection with Federal-Mogul's emergence from bankruptcy in 2008, trusts were funded and established to assume liability for and resolve Federal-Mogul's legacy asbestos liabilities in the United States and United Kingdom. Accordingly, those legacy liabilities in the United States and United Kingdom have had no ongoing impact on Federal-Mogul, Tenneco or their operations.

The Company is also from time to time involved in other legal proceedings, claims or investigations. Some of these matters involve allegations of damages against the Company relating to environmental liabilities (including toxic tort, property damage and remediation), intellectual property matters (including patent, trademark and copyright infringement, and licensing disputes), personal injury claims (including injuries due to product failure, design or warning issues, and other product liability related matters), taxes, unclaimed property, employment matters, and commercial or contractual disputes, sometimes related to acquisitions or divestitures. Additionally, some of these matters involve allegations relating to legal compliance.

While the Company vigorously defends itself against all of these legal proceedings, claims and investigations and take other actions to minimize its potential exposure, in future periods, the Company could be subject to cash costs or charges to earnings if any of these matters are resolved on unfavorable terms. Although the ultimate outcome of any legal matter cannot be predicted with certainty, based on current information, including the Company's assessment of the merits of the particular claim, except as described above under "Antitrust Investigations", the Company does not expect these legal proceedings, claims or investigations currently pending against it will have any material adverse effect on its annual consolidated financial position, results of operations or liquidity.

Asset Retirement Obligations
As a result of the Federal-Mogul Acquisition, the Company acquired liabilities related to asset retirement obligations (ARO). The Company's primary ARO activities relate to the removal of hazardous building materials at its facilities. The Company records an ARO at fair value upon initial recognition when the amount is probable and can be reasonably estimated. ARO fair values are determined based on the Company's determination of what a third party would charge to perform the remediation activities, generally using a present value technique.

The Company maintains ARO liabilities in the consolidated balance sheets as follows:

	December 31	
	2019	2018
Accrued expenses and other current liabilities	$ 3	$ 3
Deferred credits and other liabilities	13	12
	$ 16	$ 15

The following is a rollforward of the Company's ARO liability for the years ended December 31, 2019 and 2018:

Balance at December 31, 2017	$ —
Acquisitions	12
Liabilities incurred	3
Liabilities settled/adjustments	—
Balance at December 31, 2018	15
Liabilities incurred	—
Liabilities settled/adjustments	—
Foreign currency	1
Balance at December 31, 2019	$ 16

Warranty Matters
The Company provides warranties on some of its products. The warranty terms vary but range from one year up to limited lifetime warranties on some of its premium aftermarket products. Provisions for estimated expenses related to product warranty are made at the time products are sold or when specific warranty issues are identified with the Company's products. These estimates are established using historical information about the nature, frequency, and average cost of warranty claims. The Company believes the warranty reserve is appropriate; however, actual claims incurred could differ from the original estimates, requiring adjustments to the reserve. The reserve is included in both current and long-term liabilities on the consolidated balance sheets.

Below is a table that shows the activity in the warranty accrual accounts:

	Year Ended December 31		
	2019	2018	2017
Balance at beginning of period	$ 45	$ 32	$ 27
Acquisitions	—	17	—
Accruals related to product warranties	32	14	15
Reductions for payments made	(23)	(18)	(10)
Balance at end of period	$ 54	$ 45	$ 32

16. Leases

The Company has operating and finance leases for real estate and equipment. Generally, the leases have remaining terms of one month to ten years. Leases with an initial term of 12 months or less which do not include an option to purchase the underlying asset that the Company is reasonably certain to exercise are not recorded on the balance sheet. The Company recognizes lease expense for these leases on a straight-line basis over the lease term.

In addition, some leases include options to terminate the lease. The Company generally negotiates these termination clauses in anticipation of any changes in market conditions; however, because a termination option requires approval from management, the Company assumes the majority of its termination options will not be exercised when determining the lease term.

The Company has elected the practical expedient to not separate non-lease components from the lease components to which they relate, and instead account for each separate lease and non-lease component associated with that lease component as a single lease component for all underlying asset classes. Accordingly, all costs associated with a lease contract are accounted for as lease cost. Lease expense is recorded in operating expenses in the results of operations.

Some leasing arrangements require variable payments that are dependent on usage, output, or may vary for other reasons, such as insurance and tax payments. The variable portion of lease payments is not included in the computation of the right of use assets or lease liabilities. Rather, variable payments, other than those dependent upon a market index or rate, are expensed when the obligation for those payments is incurred and are included in "Cost of sales" and "Selling, general, and administrative" within the consolidated statements of income (loss).

The Company does not include significant restrictions or covenants in its lease agreements, and residual value guarantees are generally not included within its operating leases.

The components of lease expense were as follows:

	Year Ended December 31, 2019
Operating lease expense	$ 131
Finance lease expense	
Amortization of right-of-use assets	1
Short-term lease expense	13
Variable lease expense	26
Sublease income	(1)
Total lease expense	$ 170

Other information related to leases was as follows:

	Year Ended December 31, 2019
Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash flows from operating leases	$ 160
Financing cash flows from finance leases	$ 1
Right-of-use assets obtained in exchange for lease obligations:	
Operating leases	$ 170

Supplemental balance sheet information related to leases was as follows:

	December 31, 2019
Operating leases	
Operating lease right-of-use assets [(a)]	$ 331
Other current liabilities [(b)]	$ 96
Other long-term liabilities [(c)]	234
Total operating lease liabilities	$ 330
Finance leases	
Property, plant and equipment, gross	$ 2
Accumulated depreciation	(1)
Total finance lease right-of-use assets	$ 1
Other current liabilities [(b)]	$ 1
Other long-term liabilities [(c)]	1
Total finance lease liabilities	$ 2

[(a)] Included in "Other assets" in the consolidated balance sheets.
[(b)] Included in "Accrued expenses and other current liabilities" in the consolidated balance sheets.
[(c)] Included in "Deferred credits and other liabilities" in the consolidated balance sheets.

	December 31, 2019	
	Weighted average remaining lease term	Weighted average discount rate
Operating leases	4.82	4.24%
Finance leases	3.18	4.02%

Maturities of lease liabilities under non-cancellable leases as of December 31, 2019 were as follows:

Year ending December 31	Operating leases	Finance leases
2020	$ 109	$ 2
2021	84	—
2022	61	—
2023	44	—
2024	27	
Thereafter	40	—
Total future undiscounted lease payments	365	2
Less imputed interest	(35)	—
Total reported lease liability	$ 330	$ 2

Total rental expense (under ASC 840) for the years ended December 31, 2018 and 2017 was $111 million and $81 million.

At December 31, 2018, future minimum operating lease payments (under ASC 840) for the years ended December 31, 2019, 2020, 2021, 2022, 2023, and beyond were as follows: $120 million, $100 million, $86 million, $68 million, $56 million, and $53 million.

17. Share-Based Compensation

The Company's current long-term incentive compensation plan, which was originally adopted in 2006 and amended in 2009, 2013, and 2018, is known as the Tenneco Inc. 2006 Long-Term Incentive Plan ("2006 LTIP"). The types of awards that may be granted under the 2006 LTIP are stock-options (both incentive and non-qualified stock options), stock appreciation rights ("SARs"), Full Value Awards (including bonus stock, stock units, restricted stock, restricted stock units ("RSUs"), deferred stock units, performance stock, and performance stock units ("PSUs")), and cash incentive awards (including long-term performance units ("LTPUs") and cash settled RSUs).

On September 12, 2018, the stockholders of the Company approved an amendment to the 2006 LTIP to increase the shares of common stock available thereunder to 3.0 million. Share-settled awards are settled through the issuance of new shares of Class A Common Stock. As of December 31, 2019, up to 14.8 million shares of the Company's Class A Common Stock are authorized to be issued under its 2006 LTIP, of which approximately 1,964,372 shares remain authorized for granting under the plan.

In 2018, the Company prospectively changed its vesting policy regarding retirement eligibility and now require a retirement eligible employee (or an employee who becomes retirement eligible) to provide at least one year of service from the grant date in order for the award to vest. If an employee becomes retirement eligible after the first year of vesting but before completion of the three-year term, the Company amortizes the expense for the share-based awards over a period starting at the grant date to the date an employee becomes retirement eligible. Prior to 2018, for employees eligible to retire at grant date, the Company immediately expensed the granted awards.

Director restricted stock awards generally vest on the date of grant. Stock options, RSUs (both cash-settled and share-settled) and restricted stock are time-based service awards and generally vest according to a three-year graded vesting schedule. One-third of the award will vest on the first anniversary of the grant date, one-third of the award will vest on the second anniversary, and one-third of the award will vest on the third anniversary.

LTPU and PSU awards generally have a three-year performance period and cliff vest at the end of the period based upon achievement of performance and market targets established at the time of grant. Generally, 50% of the award is based on performance targets and 50% is based on market targets. The market target for both LTPUs and PSUs is Company total shareholder return (TSR) percentile ranking among peer companies with TSR defined as change in stock price plus dividends paid divided by beginning stock price. The LTPUs have two performance targets, Cumulative EBITDA and Cumulative free cash flow, which are defined in the award. The 2018 PSUs have one performance target, Cumulative economic value added, which is defined in the award.

Director restricted stock, restricted stock and RSUs (cash-settled and share-settled) will participate in any dividends during the vesting period, which are subject to the same vesting terms of the award. The dividends are generally paid in cash on the settlement date of the award.

The fair value of restricted stock and RSUs (cash-settled and share-settled) are determined using the average of the high and low trading price of the Company's common stock on the date of measurement. The fair value of LTPU's and PSUs are determined using the probability weighted factors for performance conditions combined with Monte Carlo simulation model for market conditions. The Monte Carlo model utilizes multiple input variables that determine the probability of satisfying the market condition stipulated in the award and calculated the fair value of the award. The starting stock price is based on the trailing 20-day closing stock price as of the beginning of the performance period and the closing stock price on the valuation date, as well as the respective stock prices for component companies. The risk-free rate is based on yields observed on the U.S. Treasury constant maturity notes with a term equal to the remaining term of the award being measured. Expected volatilities utilized in the model are based on historical volatility of the Company and the companies in the S&P 500 index using daily stock price returns prior to the valuation date, commensurate with the remaining performance period at the measurement date. The cross correlation among stock price returns of the Company and each of the component companies in the S&P 500 with the S&P 500 Index are calculated based on daily returns over the trailing period commensurate with the remainder of the performance period at the valuation date.

For restricted stock, share-settled RSUs and PSUs that have not yet vested, the Company estimates forfeitures by taking the average of the past actual forfeiture rate for these grants.

Cash-Settled Awards

The Company has granted RSUs and LTPUs to certain key employees that are payable in cash. These awards are classified as liabilities and are valued based on the fair value of the award at the grant date and are remeasured at each reporting date until settlement with compensation expense being recognized in proportion to the completed requisite period up until date of settlement. At December 31, 2019, the LTPUs outstanding included a three-year grant for 2017-2019 payable in the first quarter of 2020.

Total share-based compensation expense (net of taxes) for the cash-settled awards was expense of $3 million, a benefit of $1 million, and expense of $4 million for the years ended December 31, 2019, 2018, and 2017. Share-based compensation expense is included in selling, general and administrative expenses in the consolidated statements of income (loss). As of December 31, 2019, no unrecognized costs on the cash-settled awards remain.

Share-Settled Awards

The Company has granted restricted stock and stock options to its directors and certain key employees. In addition, beginning in 2018, the Company has granted RSUs and PSUs that are payable in common stock to certain key employees. These awards are settled in shares upon vesting with compensation expense being recognized based on the grant date fair value recognized ratably over the requisite service period if it is probable the performance target related to the PSUs will be achieved and subsequently adjusted if the probability assessment changes.

Total share-based compensation expense (net of taxes) for the share-settled awards was $19 million, $11 million, and $11 million for the years ended December 31, 2019, 2018, and 2017. Share-based compensation expense is included in selling, general and administrative expenses in the consolidated statements of income (loss).

Stock Options

The Company's nonqualified stock options generally have seven-year terms. There have been no stock options granted since 2014 and all options are currently vested. There was no unrecognized compensation cost related to the Company's stock option awards as of December 31, 2019.

The following table reflects the status and activity for all options to purchase common stock for the period indicated:

	Year Ended December 31, 2019			
	Shares Under Option	Weighted Avg. Exercise Prices	Weighted Avg. Remaining Life in Years	Aggregate Intrinsic Value
				(Millions)
Options outstanding at beginning of period	293,997	$ 46.89	1.4	$ —
Granted	—	—		
Exercised	(8,438)	29.08		
Forfeited/expired	(12,689)	42.90		
Options outstanding at end of period	272,870	$ 47.41	0.5	$

Cash received from stock option exercises was less than $1 million, $1 million, and $8 million for the years ended December 31, 2019, 2018, and 2017. Stock options exercised generated a tax shortfall of less than $1 million, a tax shortfall of less than $1 million, and an excess tax benefit of $2 million for the years ended December 31, 2019, 2018, and 2017.

As of December 31, 2019, all outstanding options are exercisable. The total intrinsic value of options exercised during the years ended December 31, 2019, 2018, and 2017 was less than $1 million, less than $1 million, and $6 million.

No options vested in 2019 or 2018. The total fair value of shares vested from options that were granted prior to 2015 was $2 million for the year ended December 31, 2017.

Restricted Stock, Share-Settled RSUs and PSUs
The following table reflects the status for all nonvested restricted stock, share-settled RSUs, and PSUs for the period indicated:

	Restricted Stock		Share-Settled RSUs		PSUs	
	Shares	Weighted Avg. Grant Date Fair Value	Units	Weighted Avg. Grant Date Fair Value	Units	Weighted Avg. Grant Date Fair Value
Nonvested balance at beginning of period	178,550	$ 55.46	440,403	$ 47.99	227,049	$ 49.18
Granted	36,603	34.06	867,305	34.21	634,511	24.77
Vested	(172,752)	50.18	(100,502)	53.61	—	—
Forfeited	(6,771)	56.01	(81,860)	40.70	(55,327)	43.17
Nonvested balance at end of period	35,630	$ 63.27	1,125,346	$ 37.91	806,233	$ 34.12

At December 31, 2019, the PSUs outstanding represent a three-year grant for 2018-2020 payable in the first quarter of 2021 and a three-year grant for 2019-2021 payable in the first quarter of 2022.

The total fair value of restricted stock vested was $8 million, $11 million, and $14 million for the years ended December 31, 2019, 2018, and 2017.

At December 31, 2019, approximately $40 million of total unrecognized compensation costs is expected to be recognized on the share-settled awards over a weighted-average period of approximately two years.

18. Shareholders' Equity

Common Stock

Common Stock Outstanding
The Company has authorized 175,000,000 shares ($0.01 par value) of Class A Common Stock at December 31, 2019 and 2018. The Company has authorized 25,000,000 shares ($0.01 par value) of Class B Common Stock at December 31, 2019 and 2018.

Pursuant to the Amended and Restated Certificate of Incorporation, in connection with the Federal-Mogul Acquisition, Class B Common Stock was created, and the Company's then existing common stock was reclassified as Class A Common Stock during the year ended December 31, 2018.

Total common stock outstanding and changes in common stock issued are as follows:

	Class A Common Stock			Class B Common Stock	
	Year Ended December 31			Year Ended December 31	
	2019	2018	2017	2019	2018
Shares issued at beginning of period	71,675,379	66,033,509	65,891,930	23,793,669	—
Share issuances[(a)]	—	5,651,177	—	—	23,793,669
Issuance (repurchased) pursuant to benefit plans	113,916	19,919	34,760	—	—
Restricted stock forfeited and withheld for taxes	(70,672)	(51,049)	(126,682)	—	—
Stock options exercised	8,438	21,823	233,501	—	—
Shares issued at end of period	71,727,061	71,675,379	66,033,509	23,793,669	23,793,669
Treasury stock	14,592,888	14,592,888	14,592,888	—	—
Total shares outstanding	57,134,173	57,082,491	51,440,621	23,793,669	23,793,669

[(a)] Represents an aggregate of 29,444,846 shares of Common Stock delivered to AEP as the Stock Consideration related to Federal-Mogul Acquisition. See Note 3, Acquisitions and Divestitures for additional information.

The rights of the Class A Common Stock and Class B Common Stock are the same, except with respect to voting and conversion. Holders of Class A Common Stock are entitled to one vote per share and holders of Class B Common Stock are not entitled to vote unless a proposed action would diminish their rights, powers or privileges, in which case such action must be unanimously approved by the holders of the Class B Common Stock. Holders of Class A Common Stock have no right to convert their shares into other securities. Each share of Class B Common Stock will automatically convert into a share of Class A Common Stock upon transfer, with limited exceptions. In addition, if the proposed spin-off of the Company's aftermarket and ride performance business (the "Spin-Off") does not occur by April 1, 2020, each holder of Class B Common Stock may convert its shares into an equal number of shares of Class A Common Stock, provided that the initial Class B holders would not own, in the aggregate, more than 15 percent of the Class A Common Stock following such conversion.

Shareholder Agreement
In connection with the closing of the Federal-Mogul Acquisition, on October 1, 2018, the Company, AEP, IEP, and Icahn Enterprises Holdings L.P. ("IEH") entered into a Shareholders Agreement (the "Shareholders Agreement").

Pursuant to the Shareholders Agreement, a designee of IEP will be nominated to the Company's board of directors (the "Board") at each annual meeting of stockholders until the earlier of the Spin-Off date and the date IEP and its affiliates own less than 10% of the outstanding Class A Common Stock and Class B Common Stock, measured as a single class (the "Outstanding Shares").

The Shareholders Agreement contains standstill and voting obligations applicable to IEP and its affiliates that expire on the earlier of (i) April 1, 2020, if the Spin-Off has not occurred, and (ii) one year after the date on which IEP and its affiliates cease to own at least 5% of the Outstanding Shares. Prior to IEP taking certain specified actions with respect to the Company, IEP must cause its designee to resign from the Board at least 30 days. In addition, IEP and its affiliates are prohibited from directly or indirectly acquiring, offering to acquire, or agreeing to acquire any shares of Class A Common Stock or other securities of the Company until April 1, 2021. If the Spin-Off has not occurred by April 1, 2020, the Shareholders Agreement provides that IEP may convert its shares of Class B Common Stock into Class A Common Stock to the extent the conversion would not result in IEP and its affiliates owning more than 15% of the Company's Class A Common Stock following the conversion.

Until the later of (i) the expiration of the standstill restrictions referenced above and (ii) the time when IEP and its affiliates cease to own at least 10% of the Outstanding Shares, IEP and its affiliates may not transfer any shares (a) to certain specified types of investors and (b) in an amount equal to 5% or more of the Class A Common Stock issued and outstanding at the time of such transfer (subject to certain exceptions).

For so long as IEP and its affiliates own at least 10% of the Outstanding Shares, if the Company proposes to issue any equity securities (other than in an excluded issuance), IEP and its affiliates have certain preemptive rights. The Shareholders Agreement also includes registration rights for IEP.

Share Repurchase Program
During 2015, the Company's Board of Directors approved a share repurchase program, authorizing it to repurchase up to $550 million of its then outstanding Class A Common Stock over a three-year period ("2015 Program"). In February 2017, the Company's Board of Directors authorized the repurchase of up to $400 million of its then outstanding Class A Common Stock over the next three years ("2017 Program"). The 2017 Program included $112 million that remained authorized under the 2015 Program. The Company generally acquires the shares through open market or privately negotiated transactions, and has historically utilized cash from operations. The repurchase program does not obligate the Company to repurchase shares within any specific time or situations. No new share repurchase programs were authorized by the Board of Directors in 2019 or 2018.

During the years ended December 31, 2019 and 2018, no shares were repurchased under the 2017 Program. The Company purchased 2,936,950 shares during the year ended December 31, 2017 through open market purchases at a total cost of $169 million, at an average price of $57.57 per share. The remaining $231 million authorized for share repurchases under the 2017 Program expired at December 31, 2019.

Preferred Stock
The Company had 50,000,000 shares of preferred stock ($0.01 par value) authorized at both December 31, 2019 and 2018. No shares of preferred stock were issued or outstanding at those dates.

19. Changes in Accumulated Other Comprehensive Income (Loss) by Component

The following represents the Company's changes in accumulated other comprehensive income (loss) by component for the years ended December 31, 2019, 2018, and 2017:

	Year Ended December 31		
	2019	2018	2017
Foreign currency translation adjustment:			
Balance at beginning of period	$ (395)	$ (263)	$ (367)
Other comprehensive income (loss) before reclassifications	23	(134)	104
Income tax provision (benefit)	3	2	—
Other comprehensive income (loss), net of tax	26	(132)	104
Balance at end of period	(369)	(395)	(263)
Pension and postretirement benefits:			
Balance at beginning of period	(297)	(275)	(292)
Other comprehensive income (loss) before reclassifications	(46)	(47)	2
Reclassification to earnings	7	22	26
Other comprehensive income (loss) before tax	(39)	(25)	28
Income tax provision (benefit)	(6)	3	(11)
Other comprehensive income (loss), net of tax	(45)	(22)	17
Balance at end of period	(342)	(297)	(275)
Cash flow hedging instruments:			
Balance at beginning of period	—	—	—
Other comprehensive income (loss) before reclassifications	1	—	—
Reclassification to earnings	(1)	—	—
Other comprehensive income (loss) before tax	—	—	—
Balance at end of period	—	—	—
Accumulated other comprehensive loss at end of year	$ (711)	$ (692)	$ (538)
Other comprehensive income (loss) attributable to noncontrolling interests, net of tax	$ (10)	$ (2)	$ 2

20. Earnings (Loss) per Share

The Company computes basic earnings (loss) per share by dividing income available to common shareholders by the weighted average number of common shares outstanding. The computation of diluted earnings (loss) per share is similar to the computation of basic earnings (loss) per share, except that the Company adjusts the weighted average number of shares outstanding to include estimates of additional shares that would be issued if potentially dilutive common shares had been issued. In addition, the Company adjusts income (loss) available to common shareholders to include any changes in income or loss that would result from the assumed issuance of the dilutive common shares.

Earnings (loss) per share of common stock outstanding were computed as follows:

	Year Ended December 31		
	2019	2018	2017
Net income (loss) attributable to Tenneco Inc.	$ (334)	$ 55	$ 198
Basic earnings (loss) per share —			
Average shares of common stock outstanding	80,904,060	58,625,087	52,796,184
Earnings (loss) per average share of common stock	$ (4.12)	$ 0.93	$ 3.75
Diluted earnings (loss) per share —			
Average shares of common stock outstanding	80,904,060	58,625,087	52,796,184
Effect of dilutive securities:			
Restricted stock and RSUs	—	93,546	111,062
Stock options	—	40,099	119,665
Average shares of common stock outstanding including dilutive securities	80,904,060	58,758,732	53,026,911
Earnings (loss) per average share of common stock	$ (4.12)	$ 0.93	$ 3.73

For the years ended December 31, 2019, 2018, and 2017, the weighted average number of anti-dilutive potential common shares excluded from the calculation above totaled 1,868,274 shares, 257,567 shares, and 834 shares.

21. Segment and Geographic Area Information

As previously announced, the Company intends to separate its businesses to form two new, independent, publicly traded companies, New Tenneco and DRiV. The New Tenneco business consists of two existing operating segments, Clean Air and Powertrain:

- The Clean Air segment designs, manufactures, and distributes a variety of products and systems designed to reduce pollution and optimize engine performance, acoustic tuning, and weight on a vehicle for OEMs; and
- The Powertrain segment focuses on original equipment powertrain products for automotive, heavy duty, and industrial applications.

The Company began to manage and report its DRiV businesses through two new operating segments, in the first quarter of 2019, as compared to the three operating segments it had previously reported. The DRiV operating segments are Motorparts and Ride Performance. The new Motorparts operating segment consists of the previously reported Aftermarket operating segment as well as the aftermarket portion of the previously reported Motorparts operating segment. The Ride Performance operating segment consists of the previously reported Ride Performance operating segment as well as the OE Braking business that was included in the previously reported Motorparts operating segment:

- The Motorparts segment designs, manufactures, markets and distributes a broad portfolio of brand-name products in the global vehicle aftermarket within seven product categories including shocks and struts, steering and suspension, braking, sealing, engine, emissions, and maintenance; and
- The Ride Performance segment designs, manufactures, markets, and distributes a variety of ride performance solutions and systems to a global OE customer base, including noise, vibration, and harshness performance materials, advanced suspension technologies, ride control, and braking.

Costs related to other business activities, primarily corporate headquarter functions, are disclosed separately from the four operating segments as "Corporate." Prior period operating segment results have been conformed to reflect the Company's current operating segments.

Management uses EBITDA including noncontrolling interests as the key performance measure of segment profitability and uses the measure in its financial and operational decision-making processes, for internal reporting, and for planning and forecasting purposes to effectively allocate resources. EBITDA including noncontrolling interests is defined as earnings before interest expense, income taxes, noncontrolling interests, and depreciation and amortization. Segment assets are not presented as it is not a measure reviewed by the Chief Operating Decision Maker in allocating resources and assessing performance.

EBITDA including noncontrolling interests should not be considered a substitute for results prepared in accordance with US GAAP and should not be considered an alternative to net income, which is the most directly comparable financial measure to

EBITDA including noncontrolling interests that is in accordance with US GAAP. EBITDA including noncontrolling interests, as determined and measured by the Company, should not be compared to similarly titled measures reported by other companies.

Segment results for 2019, 2018, and 2017 are as follows:

	Reportable Segments							
	Clean Air	Powertrain	Ride Performance	Motorparts	Total Reportable Segments	Corporate	Reclass & Elims	Total
For the Year Ended December 31, 2019								
Revenues from external customers	$ 7,121	$ 4,408	$ 2,754	$ 3,167	$ 17,450	$ —	$ —	$ 17,450
Intersegment revenues	$ —	$ 160	$ 158	$ 40	$ 358	$ —	$ (358)	$ —
Equity in earnings of nonconsolidated affiliates, net of tax	$ —	$ 32	$ 4	$ 7	$ 43	$ —	$ —	$ 43
EBITDA including noncontrolling interests	$ 582	$ 363	$ 8	$ 184	$ 1,137	$ (343)		
For the Year Ended December 31, 2018								
Revenues from external customers	$ 6,707	$ 1,112	$ 2,164	$ 1,780	$ 11,763	$ —	$ —	$ 11,763
Intersegment revenues	$ —	$ 40	$ 64	$ 10	$ 114	$ —	$ (114)	$ —
Equity in earnings of nonconsolidated affiliates, net of tax	$ —	$ 14	$ —	$ 4	$ 18	$ —	$ —	$ 18
EBITDA including noncontrolling interests	$ 599	$ 93	$ 69	$ 161	$ 922	$ (255)		
For the Year Ended December 31, 2017								
Revenues from external customers	$ 6,216	$ —	$ 1,807	$ 1,251	$ 9,274	$ —	$ —	$ 9,274
Intersegment revenues	$ —	$ —	$ 22	$ —	$ 22	$ —	$ (22)	$ —
Equity in earnings of nonconsolidated affiliates, net of tax	$ —	$ —	$ —	$ —	$ —	$ (1)	$ —	$ (1)
EBITDA including noncontrolling interests	$ 564	$ —	$ 125	$ 195	$ 884	$ (245)		

Segment EBITDA including noncontrolling interests and the reconciliation to earnings before interest expense, income taxes, and noncontrolling interests are as follow:

	Year Ended December 31		
	2019	2018	2017
EBITDA including noncontrolling interests by Segments:			
Clean Air	$ 582	$ 599	$ 564
Powertrain	363	93	—
Ride Performance	8	69	125
Motorparts	184	161	195
Total Reportable Segments	1,137	922	884
Corporate	(343)	(255)	(245)
Depreciation and amortization	(673)	(345)	(226)
Earnings before interest expense, income taxes, and noncontrolling interests	121	322	413
Interest expense	(322)	(148)	(77)
Income tax (expense) benefit	(19)	(63)	(71)
Net income (loss)	$ (220)	$ 111	$ 265

The following customers accounted for 10% or more of the Company's net sales in the last three years. The net sales to both customers were across all segments.

Customer	2019	2018	2017
General Motors Company	11%	12%	14%
Ford Motor Company	10%	12%	13%

	Revenues from external customers [(b)]			Long-lived assets [(c)]	
	Year Ended December 31			December 31	
	2019	2018	2017	2019	2018
United States	$ 6,203	$ 4,488	$ 3,632	$ 1,363	$ 1,234
China	2,377	1,553	1,283	768	687
Germany	2,227	1,212	798	539	543
Poland	925	731	488	331	319
United Kingdom	568	499	482	130	116
Mexico	959	543	416	277	239
India	475	316	216	182	167
Turkey	5	7	9	250	276
Other Foreign [(a)]	3,711	2,414	1,950	847	687
Consolidated	$ 17,450	$ 11,763	$ 9,274	$ 4,687	$ 4,268

(a) Revenues from external customers and long-lived assets for individual foreign countries other than China, Germany, Poland, United Kingdom, Mexico, India, and Turkey are not individually material.
(b) Revenues are attributed to countries based on location of the shipper.
(c) Long-lived assets include all long-term assets except goodwill, intangibles and deferred tax assets.

Disaggregation of revenue
Original Equipment
Value added: OE revenue is generated from providing original equipment manufacturers and servicers with products for automotive, heavy duty, and industrial applications. Supply relationships typically extend over the life of the related vehicle, subject to interim design and technical specification revisions, and do not require the customer to purchase a minimum quantity.

Substrate/Passthrough sales: Generally, in connection with the sale of exhaust systems to certain OE manufacturers, the Company purchases catalytic converters and diesel particulate filters or components thereof including precious metals ("substrates") on behalf of its customers which are used in the assembled system. These substrates are included in inventory and are "passed through" to the customer at cost, plus a small margin. Since the Company takes title to the substrate inventory and has responsibility for both the delivery and quality of the finished product including the substrates, the revenues and related expenses are recorded at gross amounts.

Aftermarket

Aftermarket revenue is generated from providing products for the global vehicle aftermarket to a wide range of warehouse distributors, retail parts stores, and mass merchants that distribute these products to customers ranging from professional service providers to "do-it-yourself" consumers.

Revenue from contracts with customers is disaggregated by product lines, as it depicts the nature and amount of the Company's revenue that is aligned with the Company's key growth strategies. In the following table, revenue is disaggregated accordingly:

	Reportable Segments				
By Customer Type	**Clean Air**	**Powertrain**	**Ride Performance**	**Motorparts**	**Total**
Year Ended December 31, 2019					
OE - Substrate	$ 3,027	$ —	$ —	$ —	$ 3,027
OE - Value add	4,094	4,408	2,754	—	11,256
Aftermarket	—	—	—	3,167	3,167
Total	$ 7,121	$ 4,408	$ 2,754	$ 3,167	$ 17,450
Year Ended December 31, 2018					
OE - Substrate	$ 2,500	$ —	$ —	$ —	$ 2,500
OE - Value add	4,207	1,112	2,164	—	7,483
Aftermarket	—	—	—	1,780	1,780
Total	$ 6,707	$ 1,112	$ 2,164	$ 1,780	$ 11,763
Year Ended December 31, 2017					
OE - Substrate	$ 2,187	$ —	$ —	$ —	$ 2,187
OE - Value add	4,029	—	1,807	—	5,836
Aftermarket	—	—	—	1,251	1,251
Total	$ 6,216	$ —	$ 1,807	$ 1,251	$ 9,274

	Reportable Segments				
By Geography	**Clean Air**	**Powertrain**	**Ride Performance**	**Motorparts**	**Total**
Year Ended December 31, 2019					
North America	$ 3,031	$ 1,503	$ 873	$ 2,018	$ 7,425
Europe, Middle East, Africa, and South America	2,388	2,106	1,338	932	6,764
Asia Pacific	1,702	799	543	217	3,261
Total	$ 7,121	$ 4,408	$ 2,754	$ 3,167	$ 17,450
Year Ended December 31, 2018					
North America	$ 2,981	$ 386	$ 770	$ 1,117	$ 5,254
Europe, Middle East, Africa, and South America	2,415	498	933	558	4,404
Asia Pacific	1,311	228	461	105	2,105
Total	$ 6,707	$ 1,112	$ 2,164	$ 1,780	$ 11,763
Year Ended December 31, 2017					
North America	$ 2,866	$ —	$ 674	$ 786	$ 4,326
Europe, Middle East, Africa, and South America	2,143	—	736	404	3,283
Asia Pacific	1,207	—	397	61	1,665
Total	$ 6,216	$ —	$ 1,807	$ 1,251	$ 9,274

The following table shows the asset expenditure information by reportable segments:

	Year Ended December 31, 2019					
	Clean Air	Powertrain	Ride Performance	Motorparts	Other unallocated assets	Total
Prior year payable on assets	$ 38	$ 48	$ 23	$ 26	$ —	$ 135
Asset additions	214	269	192	42	26	743
Less: Current year payable on assets	(44)	(52)	(31)	(7)	—	(134)
Cash payments for property, plant, and equipment	$ 208	$ 265	$ 184	$ 61	$ 26	$ 744

	Year Ended December 31, 2018					
	Clean Air	Powertrain	Ride Performance	Motorparts	Other unallocated assets	Total
Prior year payable on assets	$ 33	$ —	$ 22	$ 4	$ —	$ 59
Capex in accounts payable acquired	—	25	12	5	—	42
Asset additions	202	81	149	53	56	541
Less: Current year payable on assets	(38)	(48)	(23)	(26)	—	(135)
Cash payments for property, plant, and equipment	$ 197	$ 58	$ 160	$ 36	$ 56	$ 507

	Year Ended December 31, 2017					
	Clean Air	Powertrain	Ride Performance	Motorparts	Other unallocated assets	Total
Prior year payable on assets	$ 43	$ —	$ 19	$ 5	$ 1	$ 68
Asset additions	212	—	145	27	26	410
Less: Current year payable on assets	(33)	—	(22)	(4)	—	(59)
Cash payments for property, plant, and equipment	$ 222	$ —	$ 142	$ 28	$ 27	$ 419

The Other unallocated assets are comprised of software additions not included in segment information.

22. Related Party Transactions

The parties presented in the tables below, other than Montagewerk Abgastechnik Emden GmbH, became related parties of the Company as a result of the Federal-Mogul Acquisition discussed in Note 3, Acquisitions and Divestitures, with net sales, purchases, and royalty and other income presented being reflective of activity post acquisition date. Amounts presented as Icahn Automotive Group LLC represent the Company's activity with Auto Plus and Pep Boys. See Note 8, Investment in Nonconsolidated Affiliates, for further information on companies within the tables below that represent equity method investments.

As part of the Federal-Mogul Acquisition, the Company acquired a redeemable noncontrolling interests related to a subsidiary in India. In accordance with local regulations, the Company initiated the process to make a tender offer of the shares it does not own due to the change in control triggered by the Federal-Mogul Acquisition. The Company entered into separate agreements with IEP subsequent to the Purchase Agreement whereby IEP agreed to fund and execute the tender offer for the shares on behalf of the Company. As a result of finalizing the redemption value, the Company recorded a $53 million loss to income available to common shareholders concurrently with marking the related redeemable noncontrolling interest to its redemption value in the year ended December 31, 2019. The loss to common shareholders was fully absorbed by IEP and resulted in an adjustment to additional paid-in capital. See Note 2, Summary of Significant Accounting Policies, for further information on this redeemable noncontrolling interest.

The following table is a summary of net sales, purchases, and royalty and other income (expense), net to the Company's related parties for the year ended December 31, 2019 and 2018:

	Year Ended December 31, 2019		
	Net Sales	Purchases	Royalty and Other Income(Expense)
Anqing TP Goetze Piston Ring Company Limited	$ 7	$ 59	$ 3
Anqing TP Powder Metallurgy Company Limited	$ 1	$ 3	$ 1
Dongsuh Federal-Mogul Industrial Co., Ltd.	$ 4	$ 11	$ —
Federal-Mogul Powertrain Otomotiv A.S.	$ 69	$ 257	$ 4
Federal-Mogul TP Liner Europe Otomotiv Ltd. Sti.	$ —	$ 7	$ —
Federal-Mogul TP Liners, Inc.	$ 16	$ 54	$ 2
Frenos Hidraulicos Auto	$ —	$ 1	$ —
Icahn Automotive Group LLC	$ 180	$ —	$ 5
Montagewerk Abgastechnik Emden GmbH	$ 7	$ —	$ —
PSC Metals, Inc.	$ —	$ —	$ [illegible]

	Year Ended December 31, 2018		
	Net Sales	Purchases	Royalty and Other Income(Expense)
Anqing TP Goetze Piston Ring Company Limited	$ —	$ 16	$ —
Anqing TP Powder Metallurgy Company Limited	$ 1	$ 1	$ —
Dongsuh Federal-Mogul Industrial Co., Ltd.	$ 1	$ 2	$ —
Federal-Mogul Powertrain Otomotiv A.S.	$ 11	$ 53	$ 4
Federal-Mogul TP Liner Europe Otomotiv Ltd. Sti.	$ —	$ 13	$ —
Federal-Mogul TP Liners, Inc.	$ 2	$ 14	$ 4
Icahn Automotive Group LLC	$ 52	$ —	$ 1
Montagewerk Abgastechnik Emden GmbH	$ 1	$ —	$ —

The following table is a summary of amounts due to and from the Company's related parties as of December 31, 2019 and 2018:

	December 31, 2019		December 31, 2018	
	Receivables	Payables and accruals	Receivables	Payables and accruals
Anqing TP Goetze Piston Ring Company Limited	$ 1	$ 26	$ 1	$ 22
Anqing TP Powder Metallurgy Company Limited	$ —	$ 1	$ 1	$ 1
Dongsuh Federal-Mogul Industrial Co., Ltd.	$ —	$ 2	$ 1	$ 2
Farloc Argentina SAIC	$ 1	$ —	$ —	$ —
Federal-Mogul Powertrain Otomotiv A.S.	$ 8	$ 31	$ 9	$ 16
Federal-Mogul TP Liner Europe Otomotiv Ltd. Sti.	$ [illegible]	$ [illegible]	$ —	$ 1
Federal-Mogul TP Liners, Inc.	$ 2	$ 7	$ 2	$ 7
Icahn Automotive Group LLC	$ 52	$ 10	$ 60	$ 12
Montagewerk Abgastechnik Emden GmbH	$ 1	$ —	$ —	$ —

23. Quarterly Financial Data (Unaudited)

The following tables present the unaudited quarterly results of operations for the eight quarters ended December 31, 2019. This quarterly information has been prepared on the same basis as the consolidated financial statements and, in the opinion of management, reflects all adjustments necessary for the fair statement of the information for the periods presented. This data should be read in conjunction with the consolidated financial statements and related disclosures. Operating results for any quarter apply to that quarter only and are not necessarily indicative of results for any future period. The 2018 amounts below reflect the reclassifications to prior periods as discussed in Note 2, Summary of Significant Accounting Policies.

Quarter	Net sales and operating revenues	Cost of sales (exclusive of depreciation and amortization)[(a)]	Earnings (loss) before interest expense, income taxes, and noncontrolling interests	Net income (loss) attributable to Tenneco Inc.
2019				
1st	$ 4,484	$ 3,870	$ (24)	$ (117)
2nd	4,504	3,801	141	26
3rd	4,319	3,660	148	70
4th [(c)]	4,143	3,581	(144)	(313)
Full Year	$ 17,450	$ 14,912	$ 121	$ (334)

Quarter	Net sales and operating revenues	Cost of sales (exclusive of depreciation and amortization)	Earnings (loss) before interest expense, income taxes, and noncontrolling interests	Net income (loss) attributable to Tenneco Inc.
2018				
1st	$ 2,581	$ 2,193	$ 122	$ 60
2nd	2,533	2,134	111	47
3rd	2,371	2,002	112	57
4th	4,278	3,673	(23)	(109)
Full Year	$ 11,763	$ 10,002	$ 322	$ 55

Quarter	Basic earnings (loss) per share of common stock[(b)]	Diluted earnings (loss) per share of common stock[(b)]
2019		
1st	$ (1.44)	$ (1.44)
2nd	0.32	0.32
3rd	0.87	0.87
4th	(3.87)	(3.87)
Full Year	$ (4.12)	$ (4.12)

Quarter	Basic earnings (loss) per share of common stock[(b)]	Diluted earnings (loss) per share of common stock[(b)]
2018		
1st	$ 1.17	$ 1.17
2nd	0.92	0.92
3rd	1.11	1.11
4th	(1.35)	(1.35)
Full Year	$ 0.93	$ 0.93

[(a)] The three months ended March 31, 2019, three months ended June 30, 2019, and three months ended September 30, 2019 amounts have been presented reflecting the reclassifications discussed in Note 2, Summary of Significant Accounting Policies.
[(b)] The sum of the quarters may not equal the total of the respective year's earnings per share on either a basic or diluted basis due to changes in the weighted average shares outstanding throughout the year.
[(c)] The fourth quarter of 2019 includes an immaterial out of period adjustment recorded in the Motorparts segment of $15 million (net of taxes of $5 million) related to the prior quarters of 2019.

24. Supplemental Guarantor Condensed Consolidating Financial Statements

Basis of Presentation

Substantially all of the Company's existing and future material domestic 100% owned subsidiaries (which are referred to as the Guarantor Subsidiaries) fully and unconditionally guarantee its senior notes on a joint and several basis. However, a subsidiary's guarantee may be released in certain customary circumstances such as a sale of the subsidiary or all or substantially all of its assets in accordance with the indenture applicable to the notes. The Guarantor Subsidiaries are combined in the presentation below.

These condensed consolidating financial statements are presented on the equity method. Under this method, the Company's investments are recorded at cost and adjusted for its ownership share of a subsidiary's cumulative results of operations, capital contributions and distributions, and other equity changes. You should read the condensed consolidating financial information of the Guarantor Subsidiaries in connection with the Company's consolidated financial statements and related notes of which this note is an integral part.

The accompanying supplemental guarantor condensed consolidating financial statements have been updated to reflect the reclassifications as described in Note 2, Summary of Significant Accounting Policies.

As discussed in Note 3, Acquisitions and Divestitures, the Company finalized the valuation of the assets and liabilities of the Federal-Mogul Acquisition and Öhlins Acquisition during the third and fourth quarters of 2019, respectively.

Distributions

There are no significant restrictions on the ability of the Guarantor Subsidiaries to make distributions to the Company.

STATEMENT OF COMPREHENSIVE INCOME (LOSS)

	Year Ended December 31, 2019				
	Guarantor Subsidiaries	Nonguarantor Subsidiaries	Tenneco Inc. (Parent Company)	Reclass & Elims	Consolidated
Revenues					
Net sales and operating revenues:					
External	$ 6,390	$ 11,060	$ —	$ —	$ 17,450
Affiliated companies	909	1,075	—	(1,984)	—
	7,299	12,135	—	(1,984)	17,450
Costs and expenses					
Cost of sales (exclusive of depreciation and amortization)	6,290	10,606	—	(1,984)	14,912
Selling, general, and administrative	669	463	6	—	1,138
Depreciation and amortization	325	346	2	—	673
Engineering, research, and development	136	188	—	—	324
Restructuring charges and asset impairments	62	64	—	—	126
Goodwill and intangible impairment charge	172	69	—	—	241
	7,654	11,736	8	(1,984)	17,414
Other income (expense)					
Non-service pension and postretirement benefit (costs) credits	2	(13)	—	—	(11)
Equity in earnings (losses) of nonconsolidated affiliates, net of tax	3	40	—	—	43
Other income (expense), net	34	19	—	—	53
	39	46	—	—	85
Earnings (loss) before interest expense, income taxes and noncontrolling interests	(316)	445	(8)	—	121
Interest expense:					
External, net of interest capitalized	(37)	(29)	(256)	—	(322)
Affiliated companies, net of interest income	25	(7)	(18)		
Earnings (loss) before income taxes and noncontrolling interests	(328)	409	(282)	—	(201)
Income tax (expense) benefit	117	(131)	(5)	—	(19)
Equity in net income (loss) from affiliated companies	196	—	(27)	(169)	—
Net income (loss)	(15)	278	(314)	(169)	(220)
Less: Net income attributable to noncontrolling interests	—	114	—	—	114
Net income (loss) attributable to Tenneco Inc.	$ (15)	$ 164	$ (314)	$ (169)	$ (334)
Comprehensive income (loss) attributable to Tenneco Inc.	$ 27	$ 77	$ (353)	$ (104)	$ (353)

STATEMENT OF COMPREHENSIVE INCOME (LOSS)

	Year Ended December 31, 2018				
	Guarantor Subsidiaries	Nonguarantor Subsidiaries	Tenneco Inc. (Parent Company)	Reclass & Elims	Consolidated
Revenues					
Net sales and operating revenues:					
External	$ 4,678	$ 7,085	$ —	$ —	$ 11,763
Affiliated companies	606	725	—	(1,331)	—
	5,284	7,810	—	(1,331)	11,763
Costs and expenses					
Cost of sales (exclusive of depreciation and amortization)	4,551	6,795	(13)	(1,331)	10,002
Selling, general, and administrative	430	289	33	—	752
Depreciation and amortization	153	192	—	—	345
Engineering, research, and development	94	106	—	—	200
Restructuring charges and asset impairments	20	97	—	—	117
Goodwill and intangible impairment charge	3	—	—	—	3
	5,251	7,479	20	(1,331)	11,419
Other income (expense)					
Non-service pension and postretirement benefit (costs) credit	(13)	(9)	2	—	(20)
Loss on extinguishment of debt	—	—	(10)	—	(10)
Equity in earnings (losses) of nonconsolidated affiliates, net of tax	—	18	—	—	18
Other income (expense), net	(29)	38	(1)	(18)	(10)
	(42)	47	(9)	(18)	(22)
Earnings (loss) before interest expense, income taxes, noncontrolling interests and equity in net income from affiliated companies	(9)	378	(29)	(18)	322
Interest expense:					
External, net of interest capitalized	(33)	(21)	(94)	—	(148)
Affiliated companies, net of interest income	14	(7)	(7)	—	—
Earnings (loss) before income taxes, noncontrolling interests and equity in net income from affiliated companies	(28)	350	(130)	(18)	174
Income tax (expense) benefit	30	(93)	—	—	(63)
Equity in net income (loss) from affiliated companies	135	—	184	(319)	—
Net income (loss)	137	257	54	(337)	111
Less: Net income attributable to noncontrolling interests	—	56	—	—	56
Net income (loss) attributable to Tenneco Inc.	$ 137	$ 201	$ 54	$ (337)	$ 55
Comprehensive income (loss) attributable to Tenneco Inc.	$ 159	$ 24	$ (31)	$ (251)	$ (99)

STATEMENT OF COMPREHENSIVE INCOME (LOSS)

	Year Ended December 31, 2017				
	Guarantor Subsidiaries	Nonguarantor Subsidiaries	Tenneco Inc. (Parent Company)	Reclass & Elims	Consolidated
Revenues					
Net sales and operating revenues:					
External	$ 3,889	$ 5,385	$ —	$ —	$ 9,274
Affiliated companies	540	640	—	(1,180)	—
	4,429	6,025	—	(1,180)	9,274
Costs and expenses					
Cost of sales (exclusive of depreciation and amortization)	3,773	5,178	—	(1,180)	7,771
Selling, general, and administrative	391	241	—	—	632
Depreciation and amortization	91	135	—	—	226
Engineering, research, and development	77	81	—	—	158
Restructuring charges and asset impairments	4	43	—	—	47
Goodwill and intangible impairment charge	—	11	—	—	11
	4,336	5,689	—	(1,180)	8,845
Other income (expense)					
Non-service pension and postretirement benefit (costs) credits	(18)	2	—	—	(16)
Loss on extinguishment of debt	(1)	—	—	—	(1)
Equity in earnings (losses) of nonconsolidated affiliates, net of tax	—	(1)	—	—	(1)
Other income (expense), net	7	48	—	(53)	2
	(12)	49	—	(53)	(16)
Earnings (loss) before interest expense, income taxes, noncontrolling interests and equity in net income from affiliated companies	81	385	—	(53)	413
Interest expense:					
External, net of interest capitalized	(20)	(8)	(49)	—	(77)
Affiliated companies, net of interest income	15	(6)	(9)	—	—
Earnings (loss) before income taxes, noncontrolling interests and equity in net income from affiliated companies	76	371	(58)	(53)	336
Income tax (expense) benefit	10	(81)	—	—	(71)
Equity in net income (loss) from affiliated companies	149	—	265	(414)	—
Net income (loss)	235	290	207	(467)	265
Less: Net income attributable to noncontrolling interests	—	67	—	—	67
Net income (loss) attributable to Tenneco Inc.	$ 235	$ 223	$ 207	$ (467)	$ 198
Comprehensive income (loss) attributable to Tenneco Inc.	$ 282	$ 173	$ 331	$ (467)	$ 319

BALANCE SHEETS

	December 31, 2019				
	Guarantor Subsidiaries	Nonguarantor Subsidiaries	Tenneco Inc. (Parent Company)	Reclass & Elims	Consolidated
ASSETS					
Current assets:					
Cash and cash equivalents	$ 126	$ 438	$ —	$ —	$ 564
Restricted cash	—	2	—	—	2
Receivables, net	731	1,807	—	—	2,538
Inventories, net	868	1,131	—	—	1,999
Prepayments and other current assets	163	410	59	—	632
Total current assets	1,888	3,788	59	—	5,735
Property, plant and equipment, net	1,140	2,478	9	—	3,627
Investment in affiliated companies	1,617	—	4,903	(6,520)	—
Long-term receivables, net	9	1	—	—	10
Goodwill	479	296	—	—	775
Intangibles, net	892	530	—	—	1,422
Investments in nonconsolidated affiliates	43	475	—	—	518
Deferred income taxes	353	244	10	—	607
Other assets	141	378	13	—	532
Total assets	$ 6,562	$ 8,190	$ 4,994	$ (6,520)	$ 13,226
LIABILITIES AND SHAREHOLDERS' EQUITY					
Current liabilities:					
Short-term debt, including current maturities of long-term debt	$ 1	$ 169	$ 15	$ —	$ 185
Accounts payable	750	1,897	—	—	2,647
Accrued compensation and employee benefits	77	243	5	—	325
Accrued income taxes	1	71	—	—	72
Accrued expenses and other current liabilities	445	572	53	—	1,070
Total current liabilities	1,274	2,952	73	—	4,299
Long-term debt	182	9	5,180	—	5,371
Intercompany due to (due from)	1,843	(106)	(1,737)	—	—
Deferred income taxes	—	106	—	—	106
Pension, postretirement benefits and other liabilities	707	895	33	—	1,635
Commitments and contingencies					
Total liabilities	4,006	3,856	3,549	—	11,411
Redeemable noncontrolling interests	—	196	—	—	196
Tenneco Inc. shareholders' equity	2,556	3,944	1,445	(6,520)	1,425
Noncontrolling interests	—	194	—	—	194
Total equity	2,556	4,138	1,445	(6,520)	1,619
Total liabilities, redeemable noncontrolling interests, and equity	$ 6,562	$ 8,190	$ 4,994	$ (6,520)	$ 13,226

BALANCE SHEETS

	December 31, 2018				
	Guarantor Subsidiaries	Nonguarantor Subsidiaries	Tenneco Inc. (Parent Company)	Reclass & Elims	Consolidated
ASSETS					
Current assets:					
Cash and cash equivalents	$ 329	$ 364	$ 4	$ —	$ 697
Restricted cash	—	5	—	—	5
Receivables, net	943	1,629	—	—	2,572
Inventories, net	958	1,287	—	—	2,245
Prepayments and other current assets	254	311	25	—	590
Total current assets	2,484	3,596	29	—	6,109
Property, plant and equipment, net	1,131	2,361	9	—	3,501
Investment in affiliated companies	1,421	—	4,856	(6,277)	—
Long-term receivables, net	9	1	—	—	10
Goodwill	263	383	223	—	869
Intangibles, net	1,007	510	2	—	1,519
Investments in nonconsolidated affiliates	43	501	—	—	544
Deferred income taxes	255	200	12	—	467
Other assets	48	180	—	(15)	213
Total assets	$ 6,661	$ 7,732	$ 5,131	$ (6,292)	$ 13,232
LIABILITIES AND SHAREHOLDERS' EQUITY					
Current liabilities:					
Short-term debt, including current maturities of long-term debt	$ 1	$ 152	$ —	$ —	$ 153
Accounts payable	858	1,894	7	—	2,759
Accrued compensation and employee benefits	88	255	—	—	343
Accrued income taxes	—	52	27	(15)	64
Accrued expenses and other current liabilities	436	488	77	—	1,001
Total current liabilities	1,383	2,841	111	(15)	4,320
Long-term debt	3	32	5,305	—	5,340
Intercompany due to (due from)	2,726	(215)	(2,511)	—	—
Deferred income taxes	—	88	—	—	88
Pension, postretirement benefits and other liabilities	225	705	500	—	1,430
Commitments and contingencies					
Total liabilities	4,337	3,451	3,405	(15)	11,178
Redeemable noncontrolling interests	—	138	—	—	138
Tenneco Inc. shareholders' equity	2,324	3,953	1,726	(6,277)	1,726
Noncontrolling interests	—	190	—	—	190
Total equity	2,324	4,143	1,726	(6,277)	1,916
Total liabilities, redeemable noncontrolling interests, and equity	$ 6,661	$ 7,732	$ 5,131	$ (6,292)	$ 13,232

STATEMENT OF CASH FLOWS

	Year Ended December 31, 2019				
	Guarantor Subsidiaries	Nonguarantor Subsidiaries	Tenneco Inc. (Parent Company)	Reclass & Elims	Consolidated
Operating Activities					
Net cash provided by (used in) operating activities	$ 118	$ 427	$ (89)	$ (12)	$ 444
Investing Activities					
Acquisitions, net of cash acquired	—	(158)	—	—	(158)
Proceeds from sale of assets	3	17	—	—	20
Proceeds from sale of investment in nonconsolidated affiliates	—	2	—	—	2
Net proceeds from sale of business	7	15	—	—	22
Cash payments for plant, property, and equipment	(216)	(528)	—	—	(744)
Proceeds from deferred purchase price of factored receivables	—	250	—	—	250
Other	4	(3)	1	—	2
Net cash (used in) provided by investing activities	(202)	(405)	1	—	(606)
Financing Activities					
Proceeds from term loans and notes	—	200	—	—	200
Repayments of term loans and notes	(1)	(238)	(102)	—	(341)
Borrowings on revolving lines of credit	8,221	248	651	—	9,120
Payments on revolving lines of credit	(8,038)	(211)	(635)	—	(8,884)
Repurchase of common shares	—	—	(2)	—	(2)
Cash dividends	—	—	(20)	—	(20)
Net decrease in bank overdrafts	—	(13)	—	—	(13)
Acquisition of additional ownership interest in consolidated affiliates	—	(10)	—	—	(10)
Distributions to noncontrolling interest partners	—	(43)	—	—	(43)
Other	—	(4)	—	—	(4)
Intercompany dividends and net (decrease) increase in intercompany obligations	(302)	98	192	12	—
Net cash (used in) provided by financing activities	(120)	27	84	12	3
Effect of foreign exchange rate changes on cash, cash equivalents and restricted cash	—	23	—	—	23
Increase in cash, cash equivalents and restricted cash	(204)	72	(4)	—	(136)
Cash, cash equivalents and restricted cash, January 1	329	369	4	—	702
Cash, cash equivalents and restricted cash, December 31	$ 125	$ 441	$ —	$ —	$ 566

STATEMENT OF CASH FLOWS

	Year Ended December 31, 2018				
	Guarantor Subsidiaries	Nonguarantor Subsidiaries	Tenneco Inc. (Parent Company)	Reclass & Elims	Consolidated
Operating Activities					
Net cash provided by (used in) operating activities	$ 248	$ 246	$ (36)	$ (19)	$ 439
Investing Activities					
Acquisitions, net of cash acquired	151	124	(2,469)	—	(2,194)
Proceeds from sale of assets	2	7	—	—	9
Cash payments for plant, property, and equipment	(196)	(311)	—	—	(507)
Proceeds from deferred purchase price of factored receivables	—	174	—	—	174
Other	1	3			4
Net cash used in investing activities	(42)	(3)	(2,469)	—	(2,514)
Financing Activities					
Proceeds from term loans and notes	—	26	3,400	—	3,426
Repayments of term loans and notes	(391)	(62)	—	—	(453)
Borrowings on revolving lines of credit	4,411	114	624	—	5,149
Payments on revolving lines of credit	(4,654)	(127)	(624)	—	(5,405)
Repurchase of common shares	—	—	(1)	—	(1)
Cash dividends	—	—	(59)	—	(59)
Debt issuance cost of long-term debt	(15)	—	(80)	—	(95)
Net decrease in bank overdrafts	—	(5)	—	—	(5)
Distributions to noncontrolling interest partners	—	(51)	—	—	(51)
Other	—	(30)	—	—	(30)
Intercompany dividends and net (decrease) increase in intercompany obligations	765	(33)	(751)	19	—
Net cash (used in) provided by financing activities	116	(168)	2,509	19	2,476
Effect of foreign exchange rate changes on cash, cash equivalents and restricted cash	—	(17)	—	—	(17)
Decrease in cash, cash equivalents and restricted cash	322	58	4	—	384
Cash, cash equivalents and restricted cash, January 1	7	311	—	—	318
Cash, cash equivalents and restricted cash, December 31	$ 329	$ 369	$ 4	$ —	$ 702

STATEMENT OF CASH FLOWS

	Year Ended December 31, 2017				
	Guarantor Subsidiaries	Nonguarantor Subsidiaries	Tenneco Inc. (Parent Company)	Reclass & Elims	Consolidated
Operating Activities					
Net cash provided by (used in) operating activities	$ 284	$ 290	$ (4)	$ (53)	$ 517
Investing Activities					
Acquisitions, net of cash acquired	3	5	—	—	8
Proceeds from sale of assets	—	9	—	—	9
Proceeds from sale of investment in nonconsolidated affiliates	(164)	(255)	—	—	(419)
Proceeds from deferred purchase price of factored receivables	—	112	—	—	112
Other	(4)	(6)	—	—	(10)
Net cash used in investing activities	(165)	(135)	—	—	(300)
Financing Activities					
Proceeds from term loans and notes	136	24	—	—	160
Repayments of term loans and notes	(10)	(20)	(6)	—	(36)
Borrowings on revolving lines of credit	3,956	48	2,660	—	6,664
Payments on revolving lines of credit	(3,710)	(49)	(2,978)	—	(6,737)
Repurchase of common shares	—	—	(1)	—	(1)
Cash dividends	—	—	(53)	—	(53)
Debt issuance cost of long-term debt	(8)	—	—	—	(8)
Purchase of common stock under the share repurchase program	—	—	(169)	—	(169)
Net decrease in bank overdrafts	—	(7)	—	—	(7)
Distributions to noncontrolling interest partners	—	(64)	—	—	(64)
Intercompany dividends and net (decrease) increase in intercompany obligations	(485)	(119)	551	53	—
Net cash used in financing activities	(121)	(187)	4	53	(251)
Effect of foreign exchange rate changes on cash, cash equivalents and restricted cash	—	3	—	—	3
Increase in cash, cash equivalents and restricted cash	(2)	(29)	—	—	(31)
Cash, cash equivalents and restricted cash, January 1	9	340	—	—	349
Cash, cash equivalents and restricted cash, December 31	$ 7	$ 311	$ —	$ —	$ 318

SCHEDULE II

TENNECO INC. AND CONSOLIDATED SUBSIDIARIES
SCHEDULE II — VALUATION AND QUALIFYING ACCOUNTS

Description	Balance at Beginning of Year	Additions: Charged to Costs and Expenses	Additions: Charged to Other Accounts	Deductions	Balance at End of Year
			(Millions)		
Allowance for Doubtful Accounts and Notes Receivable Deducted from Assets to Which it Applies:					
Year Ended December 31, 2019	$ 17	14	—	3	$ 28
Year Ended December 31, 2018	$ 16	5	—	4	$ 17
Year Ended December 31, 2017	$ 16	1	—	1	$ 16

Description	Balance at Beginning of Year	Provision Charged (Credited) to Expense	Allowance Changes	Other Additions (Deductions) (a)	Balance at End of Year
			(Millions)		
Deferred Tax Assets- Valuation Allowance:					
Year Ended December 31, 2019	$ 554	36	—	172	$ 762
Year Ended December 31, 2018	$ 163	—	—	391	$ 554
Year Ended December 31, 2017	$ 145	(1)	—	19	$ 163

(a) The amount for the year ended December 31, 2019 includes $142 million related to a local valuation adjustment due to an ownership change in a jurisdiction with a valuation allowance. The amount for the year ended December 31, 2018 includes $368 million related to the Federal-Mogul Acquisition and $40 million in valuation allowance remeasurements. Also included in these amounts are changes in foreign currency, primarily attributable to the euro, for the years ended December 31, 2019, 2018, and 2017.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE.

None.

ITEM 9A. CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures

An evaluation was carried out under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) and Rule 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) as of December 31, 2019.

Based on that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that the Company's disclosure controls and procedures were not effective as of December 31, 2019 because of a material weakness in our internal control over financial reporting related to the North America Motorparts business as described in Management's Report on Internal Control Over Financial Reporting included under Item 8, "Financial Statements and Supplementary Data".

Management's Report on Internal Control Over Financial Reporting

See Item 8, "Financial Statements and Supplementary Data" for management's report on internal control over financial reporting and the report of our independent registered public accounting firm thereon.

Remediation Plan

The Company is taking action to improve our internal control over financial reporting and to address the identified material weakness as of December 31, 2019. These actions include:

1) Making changes to the organizational structure within the North America Motorparts finance organization to ensure that there are sufficient personnel to design, maintain and execute internal controls over financial reporting;
2) Re-evaluating control activities related to account reconciliations within the North America Motorparts business to ensure all accounts on specific ledgers are reconciled, reviewed and approved on a timely basis; and
3) Re-evaluating control activities related to manual journal entries within the North America Motorparts business to ensure that all journal entries are reviewed and approved by different individuals on a timely basis.

Changes in Internal Control Over Financial Reporting

During the three months ended December 31, 2019, there were no changes in Tenneco's internal control over financial reporting (as defined in Rule 13a-15(f) and Rule 15d-15(f) under the Exchange Act) that have materially affected, or are reasonably likely to materially affect, Tenneco's internal control over financial reporting.

ITEM 9B. OTHER INFORMATION.

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE.

The sections entitled "Election of Directors" and "Corporate Governance" in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference. In addition, the section entitled "Information About Our Executive Officers" of this Annual Report on Form 10-K, which appears at the end of Part I, is incorporated herein by reference.

A copy of our Code of Ethical Conduct for Financial Managers, which applies to our Chief Executive Officer, Chief Financial Officer, Controller and other key financial managers, is filed as Exhibit 14 to this Form 10-K. We have posted a copy of the Code of Ethical Conduct for Financial Managers on our Internet website at *www.tenneco.com*. We will make a copy of this code available to any person, without charge, upon written request to Tenneco Inc., 500 North Field Drive, Lake Forest, Illinois 60045, Attn: General Counsel. We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K and applicable NYSE rules regarding amendments to or waivers of our Code of Ethical Conduct by posting this information on our Internet website at *www.tenneco.com*.

ITEM 11. EXECUTIVE COMPENSATION.

The sections entitled "Executive Compensation" and "Compensation Committee Report on Executive Compensation" in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS.

The sections entitled "Ownership of Common Stock" and "Securities Authorized for Issuance Under Equity Compensation Plans" in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE.

The subsections entitled "The Board of Directors and its Committees" and "Transactions with Related Persons" under the section entitled "Corporate Governance" in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES.

The sections entitled "Ratify Appointment of Independent Public Accountants — Audit, Audit-Related, Tax and All Other Fees" and "Ratify Appointment of Independent Public Accountants — Pre-Approval Policy" in our definitive Proxy Statement for the Annual Meeting of Stockholders are incorporated herein by reference.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES.

CONSOLIDATED FINANCIAL STATEMENTS INCLUDED IN ITEM 8

See "Index to Financial Statements of Tenneco Inc. and Consolidated Subsidiaries" set forth in Item 8, "Financial Statements and Supplementary Data" for a list of financial statements filed as part of this Report.

INDEX TO SCHEDULE INCLUDED IN ITEM 8

SCHEDULES OMITTED AS NOT REQUIRED OR INAPPLICABLE

Schedule I — Condensed financial information of registrant
Schedule III — Real estate and accumulated depreciation
Schedule IV — Mortgage loans on real estate
Schedule V — Supplemental information concerning property — casualty insurance operations

EXHIBITS

The following exhibits are filed with this Annual Report on Form 10-K for the fiscal year ended December 31, 2019, or incorporated herein by reference (exhibits designated by an asterisk are filed with the report; all other exhibits are incorporated by reference):

INDEX TO EXHIBITS

Exhibit Number		Description
2.1	—	Membership Interest Purchase Agreement, dated as of April 10, 2018 by and among the Company, Federal-Mogul LLC, American Entertainment Properties Corp. and Icahn Enterprises L.P. (incorporated herein by reference to Exhibit 2.1 of the registrant's Current Report on Form 8-K filed April 10, 2018. File No. 1-12387).
3.1	—	Amended and Restated Certificate of Incorporation of Tenneco Inc. (incorporated herein by reference to Exhibit 3.1 of the registrant's Current Report on Form 8-K dated October 1 2018, File No. 1-12387).
3.2	—	By-laws of the registrant, as amended and restated effective October 1, 2018 (incorporated herein by reference to Exhibit 3.2 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
*4.1	—	Description of Securities
4.1(a)	—	The description of Tenneco's common stock, $0.01 par value, contained in Tenneco's Registration Statement on Form 10 (File No. 1-12387) originally filed with the Securities and Exchange Commission (the "Commission") on October 30, 1996, as amended by Tenneco's post-effective amendment to the Registration Statement on Form 10 filed with the Commission on October 1, 2018, is incorporated herein by reference.
4.2	—	Shareholders Agreement, dated as of October 1, 2018 by and among the Company, American Entertainment Properties Corp., Icahn Enterprises Holdings L.P. and Icahn Enterprises L.P. (incorporated herein by reference to Exhibit 4.1 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.3(a)	—	Credit Agreement, dated as of October 1, 2018, among Tenneco Inc., Tenneco Automotive Operating Company Inc., JPMorgan Chase Bank, N.A., as Administrative Agent, and the other lenders party thereto (incorporated herein by reference to Exhibit 10.01 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.3(b)	—	Guarantee Agreement, dated as of October 1, 2018, among Tenneco Inc., the Guarantors party thereto and JPMorgan Chase Bank, N.A., as Administrative Agent (incorporated herein by reference to Exhibit 10.02 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.3(c)	—	Collateral Agreement, dated as of October 1, 2018, among Tenneco Inc., various subsidiaries to Tenneco, Inc. party thereto and Wilmington Trust, National Association, as Collateral Trustee (incorporated herein by reference to Exhibit 10.03 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.3(d)	—	First Amendment, dated February 14, 2020, to the Credit Agreement, dated as of October 1, 2018, by and among Tenneco Inc., Tenneco Automotive Operating Company Inc., J.P. Morgan Chase Bank, N.A., as administrative agent, and the other lenders party thereto (incorporated herein by reference to Exhibit 10.1 of the registrant's Current Report on Form 8-K dated February 19, 2020, File No 1-12387).
4.3(e)	—	Second Amendment, dated February 14, 2020, to the Credit Agreement, dated as of October 1, 2018, by and among Tenneco Inc., Tenneco Automotive Operating Company Inc., J.P. Morgan Chase Bank, N.A., as administrative agent, and the other lenders party thereto (incorporated herein by reference to Exhibit 10.2 of the registrant's Current Report on Form 8-K dated February 19, 2020, File No 1-12387).
4.4	—	Indenture, dated December 5, 2014, among the registrant, various subsidiaries of the registrant and U.S, Bank National Association, as trustee (incorporated herein by reference to Exhibit 4.1 of the registrant's Current Report on Form 8-K filed December 5, 2014, File No. 1-12387).
4.5	—	First Supplemental Indenture, dated December 5, 2014, among the registrant, various subsidiaries of the registrant and U.S. Bank National Association, as trustee (incorporated herein by reference to Exhibit 4.2 of the registrant's Current Report on Form 8-K filed December 5, 2014, File No. 1-12387).
4.6	—	Second Supplemental Indenture, dated as of June 13, 2016, among Tenneco Inc., the guarantors named therein and U.S. Bank National Association, as trustee (incorporated by reference to Exhibit 4.1 to the registrant's Current Report on Form 8-K dated June 13, 2016, File No. 1-12387).

Exhibit Number		Description
4.7	—	Indenture, dated as of March 30, 2017, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, Wilmington Trust, National Association, as Trustee, The Bank of New York Mellon, London Branch, as Paying Agent, and The Bank of New York Mellon SA/NV, Luxembourg Branch (formerly. The Bank of New York Mellon (Luxembourg) S.A.), as Registrar (including the form of 4.875% Senior Secured Notes due 2022 and the form of Floating Rate Senior Secured Notes due 2024) (incorporated herein by reference to Exhibit 4.01 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.8	—	First Supplemental Indenture, dated as of April 4, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, Wilmington Trust, National Association, as Trustee, and Bank of America, N.A. and Citibank, N.A. as Co-Collateral Trustees (incorporated herein by reference to Exhibit 4.02 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.9	—	Second Supplemental Indenture, dated as of July 30, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and Wilmington Trust, National Association, as Trustee (incorporated herein by reference to Exhibit 4.03 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.10	—	Third Supplemental Indenture, dated as of September 18, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and Wilmington Trust, National Association, as Trustee (incorporated herein by reference to Exhibit 4.04 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.11	—	Fourth Supplemental Indenture, dated as of October 1, 2018, among Tenneco Inc. (as successor by merger to Federal-Mogul LLC) and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and Wilmington Trust, National Association, as Trustee (incorporated herein by reference to Exhibit 4.05 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.12	—	Collateral Agreement, dated as of March 30, 2017, among Federal-Mogul LLC, as Company and Issuer, and certain of its subsidiaries in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.06 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.13	—	Assumption Agreement, dated as of July 30, 2018, made by Federal-Mogul Products Company LLC and Federal-Mogul Ignition LLC in favor of Bank of America, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.07 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.14	—	Assumption Agreement, dated as of September 18, 2018, made by Federal-Mogul New Products, Inc. and Federal-Mogul Products US LLC in favor of Bank of America, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.08 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.15	—	Assumption Agreement, dated as of October 1, 2018, made by Tenneco Inc., Tenneco Automotive Operating Company Inc., Tenneco International Holding Corp., Tenneco Global Holdings Inc., TMC Texas Inc., The Pullman Company and Clevite Industries Inc. in favor of Wilmington Trust, National Association, as Collateral Trustee (incorporated herein by reference to Exhibit 4.09 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.16	—	Amended and Restated Collateral Trust Agreement, dated as of April 15, 2014, among Federal-Mogul Holdings Corporation, certain of its subsidiaries and Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.10 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.17	—	Assumption Agreement, dated as of July 29, 2014, made by FM Motorparts TSC, Inc. (as predecessor to F-M Motorparts TSC LLC) in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.11 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.18	—	Assumption Agreement, dated as of July 23, 2015, made by F-M TSC Real Estate Holdings LLC in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.12 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).

Exhibit Number		Description
4.19	—	Assumption Agreement, dated as of July 28, 2015, made by Federal-Mogul Valve Train International LLC in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.13 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.20	—	Assumption Agreement, dated as of August 12, 2015, made by Federal-Mogul Sevierville, Inc. (as predecessor to Federal-Mogul Sevierville, LLC) in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.14 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.21	—	Assumption Agreement, dated as of July 14, 2016, made by Beck Arnley Holdings LLC and Federal-Mogul Filtration LLC in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.15 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.22	—	Assumption Agreement, dated as of March 30, 2017, made by Federal-Mogul Financing Corporation in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.16 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.23	—	Collateral Trust Joinder, dated as of March 30, 2017, by Wilmington Trust, National Associate, as Trustee, and acknowledged by Citibank, N.A, as Collateral Trustee (incorporated herein by reference to Exhibit 4.17 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.24	—	Collateral Trust Joinder, dated as of June 29, 2017 by The Bank of New York Mellon, London Branch, as Trustee, and acknowledged by Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.18 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.25	—	Assumption Agreement, dated as of July 30, 2018 made by Federal-Mogul Products Company LLC and Federal-Mogul Ignition LLC in favor of Bank of America, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.19 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.26	—	Assumption Agreement, dated as of September 18, 2018 made by Federal-Mogul New Products, Inc. and Federal-Mogul Products US LLC in favor of Bank of America, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.20 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.27	—	Assumption Agreement to Collateral Trust Agreement, dated as of October 1, 2018, made by Tenneco Inc., Tenneco Automotive Operating Company Inc., Tenneco International Holding Corp., Tenneco Global Holdings Inc., TMC Texas Inc., The Pullman Company and Clevite Industries Inc. in favor of Wilmington Trust, National Association, as Collateral Trustee (incorporated herein by reference to Exhibit 4.21 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.28	—	Pari Passu Intercreditor Agreement, dated as of March 30, 2017, among Credit Suisse AG, Cayman Islands Branch, as Tranche C Term Administrative Agent for the applicable PP&E Credit Agreement Secured Parties, Citibank, N.A., as Collateral Trustee, and Wilmington Trust, National Association, as the Initial Other Authorized Representative (incorporated herein by reference to Exhibit 4.22 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.29	—	Indenture, dated as of June 29, 2017, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, The Bank of New York Mellon, London Branch, as Trustee and Paying Agent, and The Bank of New York Mellon SA/NV, Luxembourg Branch (formerly, The Bank of New York Mellon (Luxembourg S.A.), as Registrar (incorporated herein by reference to Exhibit 4.23 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.30	—	First Supplemental Indenture, dated as of April 4, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, The Bank of New York Mellon, London Branch, as Trustee, and Bank of America, N.A. and Citibank, N.A., as Co-Collateral Trustees (incorporated herein by reference to Exhibit 4.24 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.31	—	Second Supplemental Indenture, dated as of July 30, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto and The Bank of New York Mellon, London Branch, as Trustee (incorporated herein by reference to Exhibit 4.25 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).

Exhibit Number		Description
4.32	—	Third Supplemental Indenture, dated as of September 18, 2018, among Federal-Mogul LLC and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto and The Bank of New York Mellon, London Branch, as Trustee (incorporated herein by reference to Exhibit 4.26 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.33	—	Fourth Supplemental Indenture, dated as of October 1, 2018, among Tenneco Inc. (as successor by merger to Federal-Mogul LLC) and Federal-Mogul Financing Corporation, as Issuers, the Guarantors party thereto, and The Bank of New York Mellon, London Branch, as Trustee (incorporated herein by reference to Exhibit 4.27 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.34	—	Collateral Agreement, dated as of June 29, 2017, among Federal-Mogul LLC, as Company and Issuer, and certain of its subsidiaries in favor of Citibank, N.A., as Collateral Trustee (incorporated herein by reference to Exhibit 4.28 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.35	—	Assumption Agreement, dated as of July 30, 2018, made by Federal-Mogul Products Company LLC and Federal-Mogul Ignition LLC in favor of Bank of America, N.A. as Collateral Trustee (incorporated herein by reference to Exhibit 4.29 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.36	—	Assumption Agreement, dated as of September 18, 2018, made by Federal-Mogul New Products, Inc. and Federal-Mogul Products US LLC in favor of Bank of America, N.A. as Collateral Trustee (incorporated herein by reference to Exhibit 4.30 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.37	—	Assumption Agreement, dated as of October 1, 2018, made by Tenneco Inc., Tenneco Automotive Operating Company Inc., Tenneco International Holding Corp., Tenneco Global Holdings Inc., TMC Texas Inc., The Pullman Company and Clevite Industries Inc. in favor of Wilmington Trust, National Association, as Collateral Trustee (incorporated herein by reference to Exhibit 4.31 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.38	—	Joinder No. 1 to Pari Passu Intercreditor Agreement, dated as of June 29, 2017, among The Bank of New York Mellon, London Branch, as Trustee, Citibank, N.A., as Collateral Trustee, Credit Suisse, AG, Cayman Islands Branch, as Tranche C Term Administrative Agent and an Authorized Representative, and Wilmington Trust National Association, as Initial Other Authorized Representative (incorporated herein by reference to Exhibit 4.32 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.39	—	Collateral Trustee Resignation and Appointment Agreement, dated as of February 23, 2018, among Bank of America, N.A., as Co-Collateral Trustee, successor Collateral Trustee and ABL Agent, Citibank. N.A., as Co-Collateral Trustee and resigning Collateral Trustee, Credit Suisse AG, Cayman Islands Branch, as PP&E First Lien Agent, Wilmington Trust, National Association, as PP&E First Lien Agent, The Bank of New Mellon, London Branch, as PP&E First Lien Agent, Federal-Mogul LLC and the other Loan Parties party thereto (incorporated herein by reference to Exhibit 4.33 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.40	—	Collateral Trustee Resignation and Appointment, Joinder, Assumption and Designation Agreement, dated as of October 1, 2018, among Wilmington Trust, National Association, as Co-Collateral Trustee, successor Collateral Trustee and PP&E First Lien Agent, Bank of America, N.A., as Co-Collateral Trustee and Retiring Collateral Trustee, the Bank of New York Mellon, London Branch, as PP&E First Lien Agent, JPMorgan Chase Bank, N.A., as Authorized Agent, Tenneco Inc. and the other Loan Parties party thereto (incorporated herein by reference to Exhibit 4.34 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.41	—	Third Supplemental Indenture, dated October 1, 2018, among Tenneco Inc., as issuer, the Guarantors party thereto and U.S. Bank National Association, as trustee (the "Trustee") (incorporated herein by reference to Exhibit 4.35 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.42	—	Fourth Supplemental Indenture, dated October 1, 2018, among Tenneco Inc., as issuer, the Guarantors party thereto and the Trustee (incorporated herein by reference to Exhibit 4.36 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.43	—	Joinder No. 2 to Pari Passu Intercreditor Agreement, dated as of October 1, 2018, among JPMorgan Chase Bank, N.A., as Additional Senior Class Debt Representative, Wilmington Trust, National Association, as Collateral Trustee, Wilmington Trust, National Association, as Initial Other Authorized Representative, The Bank of New York Mellon, London Branch, as an Authorized Representative (incorporated herein by reference to Exhibit 4.37 of the registrant's Current Report on Form 8-K dated October 1, 2018, File No. 1-12387).
4.44	—	The registrant is a party to other agreements for unregistered long-term debt securities, which do not exceed 10% of the registrant's total assets. The registrant agrees to furnish a copy of such agreements to the Commission upon request.

Exhibit Number		Description
+10.1	—	Stock Ownership Plan (incorporated herein by reference to Exhibit 10.14 of the registrant's Registration Statement on Form S-4, Reg.
+10.2	—	Supplemental Executive Retirement Plan (incorporated herein by reference to Exhibit 10.13 of the registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2000, File No. 1-12387).
+10.3	—	Form of Indemnity Agreement entered into between the registrant and Paul Stecko (incorporated herein by reference to Exhibit 10.29 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2000, File No. 1-12387).
+10.4	—	Amendment No. 1 to the Supplemental Executive Retirement Plan (incorporated herein by reference to Exhibit 10.40 of the registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2005, File No. 1-12387).
*+10.5	—	DRiV Incorporated Supplemental Retirement Plan, dated January 1, 2020.
+10.6	—	Tenneco Inc. Change in Control Severance Benefit Plan for Key Executives, as Amended and Restated effective December 12, 2007 (incorporated herein by reference to Exhibit 10.61 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2008, File No. 1-12387).
+10.7	—	Code Section 409A Amendment to Supplemental Retirement Plan (incorporated herein by reference to Exhibit 10.71 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2008, File No. 1-12387).
+10.8	—	Tenneco Inc. 2006 Long-Term Incentive Plan (as amended and restated effective March 11, 2009) (incorporated herein by reference to Appendix A of the registrant's proxy statement on Schedule 14A, filed with the Securities and Exchange Commission on March 31, 2009, File No. 1-12387).
+10.9	—	First Amendment to Tenneco Inc. Change in Control Severance Benefit Plan for Key Executives, as Amended and Restated effective December 12, 2007 (incorporated herein by reference to Exhibit 10.3 of the registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2011, File No. 1-12387).
+10.10	—	Form of Non-Qualified Stock Option Agreement for Employees under Tenneco Inc. 2006 Long-Term Incentive Plan (incorporated herein by reference to Exhibit 10.3 of the registrant's Current Report on Form 8-K dated January 18, 2012. File No. 1-12387).
+10.11	—	Letter Agreement between Tenneco Inc. and Gregg M. Sherrill (incorporated herein by reference to Exhibit 99.2 of the registrant's Current Report on Form 8-K dated as of January 5, 2007. File No. 1-12387).
+10.12	—	Letter Agreement between Tenneco Inc. and Gregg M. Sherrill, dated as of January 15, 2007 (incorporated herein by reference to Exhibit 99.1 of the registrant's Current Report on Form 8-K dated as of January 15, 2007, File No. 1-12387).
+10.13	—	Code Section 409A Amendment to Letter Agreement between the registrant and Gregg M. Sherrill (incorporated herein by reference to Exhibit 10.74 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2008, File No. 1-12387).
+10.14	—	Amended and Restated Tenneco Inc. 2006 Long-Term Incentive Plan (effective March 18, 2013) (incorporated by reference to Appendix A of the Company's Proxy Statement on Schedule 14A, filed with the Securities Exchange Commission on April 3, 2013).
+10.15	—	Form of Restricted Stock Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (awards after May 21, 2013 and before February 2017) (incorporated herein by reference to Exhibit 10.3 of the registrant's Current Report on Form 8-K filed May 21, 2013, File No. 1-12387).
+10.16	—	Form of Stock Option Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (awards after May 21, 2013 and before February 2017) (incorporated herein by reference to Exhibit 10.4 of the registrant's Current Report on Form 8-K filed May 21, 2013, File No. 1-12387).
+10.17	—	Form of Long-Term Performance Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (grants after January 14, 2014 and before February 2017) (incorporated herein by reference to Exhibit 99.2 of the registrant's Current Report on Form 8-K filed January 15, 2014, File No. 1-12387).
+10.18	—	Offer Letter to Brian J. Kesseler dated January 6, 2015 (incorporated herein by reference to Exhibit 10.67 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2014, File No. 1-12387).
+10.19	—	Second Amendment to Tenneco Inc. Change in Control Severance Benefit Plan for Key Executives (incorporated by reference to Exhibit 10.1 of registrant's Current Report on form 8-K dated April 28, 2015, File No. 1.12387).

Exhibit Number		Description
+10.20	—	Form of Restricted Stock Award for Brian J. Kesseler (January 2015 replacement grant) under Tenneco Inc. 2006 Long-Term Incentive Plan (incorporated herein by reference to Exhibit 10.71 of the registrant's Annual Report on Form 10-K for the year ended December 31,2014, File No. 1-12387).
+10.21	—	Tenneco Inc. Deferred Compensation Plan (as Amended and Restated Effective as of August 1, 2013) (incorporated by reference to Exhibit 10.6 of Tenneco Inc.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2013, File No. 1-12387).
+10.22	—	Amendment No. 1 to Tenneco Inc. 2006 Long-Term Incentive Plan, effective October 10, 2016 (incorporated herein by reference to Exhibit 10.2 to the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2016, File No. 1-12387).
+10.23	—	Notice to Employees of Agreement Amendments and New Options for Withholding, effective October 10, 2016 (incorporated herein by reference to Exhibit 10.5 to the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2016, File No. 1-12387).
+10.24	—	Form of Restricted Stock Award Agreement for Employees under Tenneco Inc. 2006 Long-Term Incentive Plan (for awards commencing February 2017) (incorporated herein by reference to Exhibit 10.78 to the registrant's Annual Report on Form 10-K for the year ended December 31, 2016, File No. 1-12387).
+10.25	—	Form of Long-Term Performance Unit Award Agreement for Employees under Tenneco Inc. 2006 Long-Term Incentive Plan (for awards commencing February 2017) (incorporated herein by reference to Exhibit 10.79 to the registrant's Annual Report on Form 10-K for the year ended December 31, 2016, File No. 1-12387).
+10.26	—	Tenneco Inc. Annual Incentive Plan (incorporated herein by reference to Exhibit 10.1 of the registrant's Current Report on Form 8-K filed February 9, 2018. File No. 1-12387).
+10.27	—	Form of Restricted Stock Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (grants after 2017) (incorporated herein by reference to Exhibit 10.2 of the registrant's Current Report on Form 8-K filed February 9, 2018. File No. 1-12387).
+10.28	—	Form of Performance Share Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (grants after 2017) (incorporated herein by reference to Exhibit 10.3 of the registrant's Current Report on Form 8-K filed February 9, 2018. File No. 1-12387).
+10.29	—	Offer Letter to Jason M. Hollar dated April 18, 2017 (incorporated herein by reference to Exhibit 10.43 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2017, File No. 1-12387).
+10.30	—	Offer Letter to Patrick Guo dated March 26, 2007 (incorporated herein by reference to Exhibit 10.46 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2017, File No. 1-12387).
+10.31	—	Amendment dated February 29, 2012 to Offer Letter to Patrick Guo (incorporated herein by reference to Exhibit 10.47 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2017, File No. 1-12387).
*+10.32	—	Offer Letter to Rainer Jueckstock dated October 1, 2018.
*+10.33	—	Offer Letter to Bradley S. Norton dated October 1, 2018.
+10.34	—	Tenneco Inc. Incentive Deferral Plan (incorporated herein by reference to Exhibit 10.48 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2017, File No. 1-12387).
*+10.35	—	Amended and Restated Tenneco Inc. Excess Benefit Plan, dated January 1, 2020.
*+10.36	—	DRiV Inc. Excess Benefit Plan, dated December 20, 2019 and effective January1, 2020.
+10.37	—	Amended and Restated Tenneco Inc. 2006 Long-Term Incentive Plan adopted September 12, 2018 (incorporated by reference to Annex D of the registrant's definitive Proxy Statement dated August 2, 2018, File No. 1-12387).
+10.38	—	Addendum, dated July 20, 2018, to Offer Letter to Brian J. Kesseler dated January 6, 2015 (incorporated herein by reference to Exhibit 10.2 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-12387).
+10.39	—	Offer Letter to Roger Wood dated July 20, 2018 (incorporated herein by reference to Exhibit 10.3 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-12387).
+10.40	—	Tenneco Automotive Operating Company Inc. Severance Benefit Plan and Summary Plan Description, effective as of July 20, 2018 (incorporated herein by reference to Exhibit 10.4 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-12387).

Exhibit Number		Description
+10.41	—	Form of Restricted Stock Unit Agreement under Tenneco Inc. 2006 Long-Term Incentive Plan (Retention Awards) (incorporated herein by reference to Exhibit 10.6 of the registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, File No. 1-12387).
+10.42	—	Tenneco Inc. 2006 Long-Term Incentive Plan Special Restricted Stock Unit and Cash Incentive Award Agreement for Jason Hollar (incorporated herein by reference to Exhibit 10.44 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.43	—	Federal-Mogul LLC 2017 Long-Term Incentive Plan Motorparts Segment (for the period January 1, 2017 - December 31, 2019) (incorporated herein by reference to Exhibit 10.45 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.44	—	Federal-Mogul LLC 2017 Long Term Incentive Plan Powertrain Segment (for the period January 1, 2017 - December 31, 2019) (incorporated herein by reference to Exhibit 10.46 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
10.45	—	Federal-Mogul LLC 2017 Long-Term Incentive Plan Motorparts Segment LTIP Award Agreement (for the period January 1, 2017 - December 31, 2019) effective January 1, 2017 (incorporated herein by reference to Exhibit 10.47 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.46	—	Federal-Mogul LLC 2017 Long Term Incentive Plan Powertrain Segment LTIP Award Agreement (for the period January 1, 2017 - December 31, 2019) effective January 1, 2017 (incorporated herein by reference to Exhibit 10.48 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.47	—	Federal-Mogul LLC 2018 Long-Term Incentive Plan Motorparts Segment (for the period January 1, 2018 - December 31, 2020) (incorporated herein by reference to Exhibit 10.49 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.48	—	Federal-Mogul LLC 2018 Long-Term Incentive Plan Powertrain (for the period January 1, 2018 - December 31, 2020) (incorporated herein by reference to Exhibit 10.50 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.49	—	Federal-Mogul LLC 2018 Long Term Incentive Plan Motorparts Segment LTIP Award Agreement (for the period January 1, 2018 - December 31, 2020) effective January 1, 2018 (incorporated herein by reference to Exhibit 10.51 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.50	—	Federal-Mogul LLC 2018 Long Term Incentive Plan Powertrain Segment LTIP Award Agreement (for the period January 1, 2018 - December 31, 2020) effective January 1, 2018 (incorporated herein by reference to Exhibit 10.52 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
+10.51	—	Form of Performance Share Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (grants after 2018) (incorporated herein by reference to Exhibit 10.53 of the registrant's Annual Report on Form 10-K for the year ended December 31, 2018, File No. 1-12387).
*+10.52	—	Form of Cash-Settled Long-Term Performance Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (for the period January 1, 2020 - December 31, 2022).
*+10.53	—	Form of Cash-Settled Restricted Stock Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (for awards commencing after February 18, 2020).
*+10.54	—	Form of Restricted Stock Unit Award Agreement under the Tenneco Inc. 2006 Long-Term Incentive Plan (for awards commencing after February 18, 2020).
*+10.55	—	Cash Retention Award Agreement, dated as of November 13, 2019, by and between Tenneco Inc. and Peng Guo.
*+10.56	—	Cash Retention Award Agreement, dated as of October 28, 2019, by and between Tenneco Inc. and Jason M. Hollar.
11	—	None.
13	—	None.
14	—	Tenneco Inc. Code of Ethical Conduct for Financial Managers (incorporated herein by reference from Exhibit 99.3 to the registrant's Annual Report on Form 10-K for the year ended December 31, 2002, File No. 1-12387).
16	—	None.
18	—	None.
*21	—	List of Subsidiaries of Tenneco Inc.
22	—	None.

Exhibit Number		Description
*23.1	—	Consent of PricewaterhouseCoopers LLP.
*24	—	Powers of Attorney.
*31.1	—	Certification of Brian J. Kesseler under Section 302 of the Sarbanes-Oxley Act of 2002.
*31.2	—	Certification of Jason M. Hollar under Section 302 of the Sarbanes-Oxley Act of 2002.
*32.1	—	Certification of Brian J. Kesseler and Jason M. Hollar under Section 906 of the Sarbanes-Oxley Act of 2002.
33	—	None.
34	—	None.
35	—	None.
99	—	None.
100	—	None.
101	—	None.
*101.INS	—	XBRL Instance Document.
*101.SCH	—	XBRL Taxonomy Extension Schema Document.
*101.CAL	—	XBRL Taxonomy Extension Calculation Linkbase Document.
*101.DEF	—	XBRL Taxonomy Extension Definition Linkbase Document.
*101.LAB	—	XBRL Taxonomy Extension Label Linkbase Document.
*101.PRE	—	XBRL Taxonomy Extension Presentation Linkbase Document.

* Filed herewith.

\+ Indicates a management contract or compensatory plan or arrangement.

ITEM 16. FORM 10-K SUMMARY.

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

TENNECO INC.

By /S/ BRIAN J. KESSELER

Brian J. Kesseler

Chief Executive Officer

Date: March 2, 2020

Pursuant to the requirements of the Securities Exchange Act of 1934 this report has been signed by the following persons in the capacities indicated on March 2, 2020.

Signature	Title
* Gregg M. Sherrill	Chairman and Director
/s/ BRIAN J. KESSELER Brian J. Kesseler	Chief Executive Officer and Director (principal executive officer)
/s/ JASON M. HOLLAR Jason M. Hollar	Executive Vice President and Chief Financial Officer (principal financial officer)
/s/ JOHN S. PATOUHAS John S. Patouhas	Vice President and Chief Accounting Officer (principal accounting officer)
* SungHwan Cho	Director
* Thomas C. Freyman	Director
* Denise Gray	Director
* Dennis J. Letham	Director
* James S. Metcalf	Director
* Roger B. Porter	Director
* David B. Price, Jr.	Director
* Charles K. Stevens III	Director
* Jane L. Warner	Director

*BY: /s/ JASON M. HOLLAR

Jason M. Hollar
Attorney in fact

EXHIBIT 4.1

DESCRIPTION OF THE REGISTRANT'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

As of February 20, 2020, Tenneco Inc. has one class of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"): our Class A Voting Common Stock, par value $0.01 per share (the "Class A Common Stock").

Description of Class A Common Stock

The following description of our Class A Common Stock is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to the provisions of our amended and restated certificate of incorporation (the "Amended and Restated Certificate") and by-laws, as amended on October 1, 2018 (the "By-Laws"), each of which are incorporated by reference as an exhibit to the Annual Report on Form 10-K of which this Exhibit is a part, and the applicable provisions of the General Corporation Law of the State of Delaware (the "DGCL"). This information may not be complete in all respects and is qualified entirely by reference to the provisions of the Amended and Restated Certificate, the By-Laws and the DGCL.

Our authorized capital stock consists of 250,000,000 shares, consisting of: 175,000,000 shares Class A Common Stock; 25,000,000 shares of Class B Non-Voting Common Stock, par value $0.01 per share (the "Class B Common Stock" and together with the Class A Common Stock, the "Common Stock"); and 50,000,000 shares of preferred stock, par value $0.01 per share.

Class A Common Stock

Rights Compared to Class B Common Stock

The rights of the Class A Common Stock and the Class B Common Stock are the same, except with respect to voting and conversion.

Voting

Holders of Class A Common Stock are entitled to one vote for each share on any matter submitted to a vote of stockholders. Except as set forth below and except as otherwise required by law, the holders of outstanding shares of Class B Common Stock will not be entitled to any votes upon any matters presented to stockholders. Except as otherwise required by law or provided in any resolution adopted by the board of directors of the Company (the "Board") with respect to any series of preferred stock, the holders of Class A Common Stock possess 100 percent of the voting power of the Company. Our Amended and Restated Certificate does not provide for cumulative voting in the election of directors.

Unless approved by a unanimous vote of the holders of the Class B Common Stock, the Company will not take any action that would (i) diminish, impair, limit, restrict or avoid, or seek to do any of the foregoing with respect to any of the rights, powers or privileges of the Class B Common Stock or the observances or performance of any of the terms of the Amended and Restated Certificate to be observed or performed by the Company, or (ii) permit, allow or agree to the diminishment, impairment, limitation, restriction or avoidance of, the observance or performance of any of the terms of the Amended and Restated Certificate to be observed or performed by the Company.

Dividends and Distributions

Subject to preferences that may apply to any outstanding shares of preferred stock that may be created by the Board, the holders of Class A Common Stock and Class B Common Stock will be entitled to share equally, on a per share basis, in any dividend or distribution of cash, property or shares of our capital stock that is paid or distributed by the Company.

Notwithstanding the forgoing, the Board may declare a dividend of any securities of the Company or of any other corporation, limited liability company or other legal entity (a "Share Distribution") to the holders of Class A Common Stock and Class B Common Stock (i) on the basis of a ratable distribution of identical securities to holders of Class A Common Stock and Class B Common Stock or (ii) on the basis of a distribution of one class or series of securities to holders of Class A Common Stock and another class or series of securities to holders of Class B Common Stock, provided that the securities so distributed do not differ in any respect other than (x) differences in their rights (other than voting rights and powers) consistent in all material respects with differences between Class A Common Stock and Class B Common Stock and (y) differences in their relative voting rights and powers, with holders of Class A Common Stock receiving the class or series of such securities having the higher relative voting rights or powers (without regard to whether such voting rights or powers differ to a greater or lesser extent than the corresponding differences in the voting rights or powers of Class A Common Stock and Class B Common Stock).

Liquidation Rights

Upon our liquidation, dissolution or winding up, holders of Class A Common Stock and Class B Common Stock will be entitled to share equally, on a per share basis, in all assets remaining after payment of any liabilities and the liquidation preferences and any accrued or declared but unpaid dividends, if any, with respect to any outstanding shares of preferred stock.

Conversion Rights

Holders of Class A Common Stock have no right to convert their Class A Common Stock into other securities.

Upon any transfer of shares of our Class B Common Stock, such shares will automatically convert into an equal number of shares of Class A Common Stock, except for certain non-converting transfers described in our Amended and Restated Certificate, including the following:

- any transfer of shares of Class B Common Stock to a broker or other nominee, provided that the transferor, immediately following such transfer, retains (i) control over the disposition of such shares and (ii) the economic consequences of ownership of such shares;
- any transfer of shares of Class B Common Stock to any affiliate of Icahn Enterprises L.P. ("IEP"), or any successor thereto; and
- any transfer of all, but not less than all, of the Class A Common Stock and Class B Common Stock then held by IEP and its affiliates, to not more than three persons designated in the shareholders agreement, dated as of October 1, 2018, by and among the Company, American Entertainment Properties Corp. ("AEP"), Icahn Enterprises Holdings L.P. ("IEH") and IEP (the "Shareholders Agreement"), acting as a consortium, pursuant to which the transferee(s) would assume and perform all of the obligations of the transferor under the Membership Interest Purchase Agreement, dated as of April 10, 2018, by and among the Company, Federal-Mogul, AEP and IEP, the Shareholders Agreement and the other transaction agreements.

In addition, if the Company does not consummate (or abandons) the proposed spin-off of its aftermarket and ride performance business by the date that is 18 months after the closing date of the acquisition of Federal-Mogul, each holder of Class B Common Stock may convert a number of such shares into an equal number of shares of Class A Common Stock, provided that such conversion would not result in such holder, AEP, IEH, IEP and any of their affiliates owning, in the aggregate, more than 15 percent of the Class A Common Stock issued and outstanding immediately following such conversion.

Preemptive Rights

The holders of the Class A Common Stock have no preemptive rights with respect to future offerings of equity securities by the Company, except that, for so long as IEP and its affiliates own at least 10 percent of the outstanding Class A Common Stock and Class B Common Stock (measured as a single class), IEP and its affiliates have certain preemptive rights by contract under the Shareholders Agreement.

If the Company proposes to issue equity securities of any kind, except in certain excluded issuances, the Company shall deliver to IEP and its affiliates a written notice, which notice shall state the material terms of the securities proposed to be issued (the "Proposed Securities"), the price and other terms of the proposed sale of such securities and the amount of such securities proposed to be issued (the "Notice"), at least five business days prior to the date of the proposed issuance, and offer to issue and sell to IEP and its affiliates, on such terms as the Proposed Securities are to be issued, a portion of the Proposed Securities equal to IEP's and its affiliates' pro rata beneficial ownership of the Class A Common Stock and Class B Common Stock (together with any other voting capital stock owned by the IEP Group, the "Voting Stock") at such time as compared to the total number of shares of Class A Common Stock, Class B Common Stock and Voting Stock, considered together, outstanding immediately prior to the issuance of the Proposed Securities; provided that the Class A Common Stock, the Class B Common Stock, any Voting Stock and any non-voting equity securities shall be issued in relative proportions that preserve (but do not increase) the voting power that IEP and its affiliates had immediately prior to the issuance of the Proposed Securities.

No Redemption Rights

There are no redemption or sinking fund provisions applicable to the Class A Common Stock or the Class B Common Stock.

Subject to Rights of Preferred Stock

The rights of the holders of Class A Common Stock and Class B Common Stock are subject to, and may be adversely affected by, the rights of holders of any shares of preferred stock that the Company may designate and issue in the future.

Antitakeover Effects of Certain Provisions

The Amended and Restated Certificate, By-Laws and DGCL contain certain provisions that could make the acquisition of the Company by means of a tender offer, a proxy contest or otherwise more difficult. The description set forth below is intended as a summary only and is qualified in its entirety by reference to the Amended and Restated Certificate and By-Laws, which are filed as exhibits to the Form 10-K of which this prospectus forms a part.

Number of Directors, Removal; Filling Vacancies

The Amended and Restated Certificate provides that the business and affairs of the Company will be managed by or under the direction of the Board, consisting of not less than eight nor more than sixteen directors, the exact number thereof to be determined from time to time by affirmative vote of a majority of the entire Board. In addition, the Amended and Restated Certificate provides that any vacancy on the Board that results from an increase in the number of directors may be filled by a majority of the directors then in office, provided that a quorum is present, and any other vacancy occurring in the Board may be filled by a majority of the directors then in office, even if less than a quorum, or by a sole remaining director.

Notwithstanding the foregoing, the Amended and Restated Certificate provides that whenever the holders of any one or more series of preferred stock have the right, voting separately as a class or series, to elect directors, the election, removal, term of office, filling of vacancies and other features of such directorships will be governed by the terms of the Amended and Restated Certificate applicable to that preferred stock or the resolutions adopted by the Board applicable thereto.

Special Meeting

The By-Laws provide that special meetings of stockholders may be called by the Board, subject to the rights of any holders of preferred stock. Moreover, the business permitted to be conducted at any special meeting of stockholders is limited to the purposes specified in the notice of meeting given by the Company.

Advance Notice Provisions for Stockholder Nominations, Stockholder Proposals and Proxy Access

The By-Laws establish an advance notice procedure for stockholders to make nominations of candidates for election of directors and to bring other business before an annual meeting of stockholders and to make nominations of candidates for election of directors at a special meeting of stockholders called for the purpose of electing one or more directors. The By-Laws also provide proxy access to certain qualifying stockholders to make nominations for candidates for election of directors.

Generally, for a stockholder notice to be timely in respect of (i) an annual meeting, such notice must be delivered to the principal executive offices of the Company, not later than the close of business on the 90th day nor earlier than the close of business on the 120th day prior to the first anniversary of the preceding year's annual meeting, and (ii) a special meeting called for the purpose of electing one or more directors, such notice must be delivered to the principal executive offices of the Company not earlier than the close of business on the 120th day prior to such special meeting and not later than the close of business on the later of the 90th prior to such special meeting or the 10th day following the day on which public announcement is first made of the date of the special meeting and of the nominees proposed by the Board to be elected at such special meeting.

Under the proxy access By-Law provision, qualifying stockholders are allowed to include their director nominees in the Company's proxy materials under certain circumstances by giving adequate and timely notice to the Secretary of the Company. A stockholder or group of no more than 20 stockholders (meeting the Company's continuous ownership requirement of 3 percent or more of the Company's outstanding common stock held continuously for at least the previous three years) can nominate a candidate or candidates for election to the Board at an annual meeting, constituting up to two directors or 20 percent of the number of directors then serving on the Board (rounded down to the nearest whole number), whichever is greater, provided that the stockholder(s) and nominee(s) satisfy the requirements specified in the By-Laws. In order for such nominees to be included in the Company's proxy statement, stockholders and nominees must submit a notice of proxy access nomination together with certain related information required by the By-Laws. The By-Laws state that, to be timely, the notice and the related information must be delivered to the Company's principal executive offices not earlier than the close of business on the 150th day nor later than the close of business on the 120th day prior to the first anniversary of the date that the Company's proxy statement was first distributed to stockholders in connection with the preceding year's annual meeting.

Record Date Procedure for Stockholder Action by Written Consent

The By-Laws establish a procedure for the fixing of a record date in respect of corporate action proposed to be taken by the stockholders of the Company by written consent in lieu of a meeting. The By-Laws provide that any person seeking to have the stockholders authorize or take corporate action by written consent without a meeting shall, by written notice addressed to our Secretary and delivered to our company, request that a record date be fixed for such purpose. The By-Laws state the Board may fix a record date for such purpose which shall be no more than 10 days after the date upon which the resolution fixing the record date is adopted by the Board. If the Board fails within 10 days after the Company receives such notice to fix a record date for such purpose, the By-Laws provide that the record date shall be the date after the expiration of such ten day time period or on the day on which the first written consent is delivered to us unless prior action by the Board is required under the DGCL, in which event the record date shall be at the close of business on the day on which the Board adopts the resolution taking such prior action.

The By-Laws also provide that the Secretary of the Company or, under certain circumstances, two inspectors designated by the Secretary, shall promptly conduct the ministerial review of the sufficiency of any written consents of stockholders duly delivered to the Company and of the validity of the action to be taken by stockholder consent as he or she deems necessary or appropriate, including, without limitation, whether the holders of a number of shares having the requisite voting power to authorize or take the action specified in the written consent have given consent.

Stockholder Meetings

The By-Laws provide that the Board and the chairman of a meeting may adopt rules and regulations for the conduct of stockholder meetings as they deem appropriate (including the establishment of an agenda, rules relating to presence at the meeting of persons other than stockholders, restrictions on entry at the meeting after commencement thereof and the imposition of time limitations for questions by participants at the meeting).

Preferred Stock

The Amended and Restated Certificate authorizes the Board to provide for series of preferred stock and, with respect to each such series, to fix the number of shares constituting such series and the designation of such series, the voting powers (if any) of the shares of such series, and the preferences and relative, participating, optional or other special rights, if any, and any qualifications, limitations or restrictions thereof, of the shares of such series.

The Company believes that the ability of the Board to issue one or more series of preferred stock provides it with flexibility in structuring possible future financings and acquisitions, and in meeting other corporate needs that might arise. The authorized shares of the preferred stock, as well as shares of Common Stock, will be available for issuance without further action by our stockholders, unless action is required by applicable law or the rules of any stock exchange or automated quotation system on which our securities may be listed or traded. The New York Stock Exchange currently requires stockholder approval as a prerequisite to listing shares in several instances, including in some cases where the present or potential issuance of shares could result in a 20 percent increase in the number of share of Common Stock outstanding or in the amount of voting securities outstanding. If the approval of stockholders of the Company is not required for the issuance of shares of preferred stock or Common Stock, the Board may determine not to seek stockholder approval.

Although the Board has no intention at the present time of doing so, it could issue a series of preferred stock that could, depending on the terms of such series, impede the completion of a merger, tender offer or other takeover attempt. The Board will make any determination to issue such shares based on its judgment as to the best interests of the Company and its stockholders. The Board, in so acting, could issue preferred stock having terms that could discourage an acquisition attempt through which an acquirer may be able to change the composition of the Board, including a tender offer or other transaction that some, or a majority, of the stockholders of the Company might believe to be in their best interests or in which stockholders might receive a premium for their stock over the then current market price of such stock.

Business Combinations

The Amended and Restated Certificate prohibits any "Business Combination" (as defined in the Amended and Restated Certificate) with "Interested Stockholders" (as defined in the Amended and Restated Certificate) without the approval of the holders of at least 66 2/3 percent of the votes entitled to be cast by holders of all the then outstanding shares of stock entitled to vote on all matters submitted to stockholders of the Company generally ("Voting Shares") not owned by an Interested Stockholder unless (i) the Business Combination is approved by a majority of the "Continuing Directors" (as defined in the Amended and Restated Certificate) or (ii) certain detailed requirements as to, among other things, the value and type of consideration to be paid to the stockholders of the Company, the maintenance of the dividend policy of the Company, the public disclosure of the Business Combination and the absence of any major change in the business or equity capital structure of the Company without the approval of a majority of the Continuing Directors, have been satisfied.

The Amended and Restated Certificate generally defines an "Interested Stockholder" as any person (other than the Company or any subsidiary, any employee benefit plan of the Company or any subsidiary or any trustee or fiduciary with respect to any such plan or holding Voting Shares for the purpose of funding any such plan or funding other employee benefits for employees of us or any subsidiary when acting in such capacity) who

(a) is or has announced or publicly disclosed a plan or intention to become the beneficial owner of Voting Shares representing five percent or more of the votes entitled to be cast by the holders of all then outstanding Voting Shares or (b) is an affiliate or associate of the Company and at any time within the two-year period immediately prior to the date in question was the beneficial owner of Voting Shares representing five percent or more of the votes entitled to be cast by the holders of all then outstanding Voting Shares.

The Amended and Restated Certificate defines a "Continuing Director" as any member of the Board, while such person is a member of the Board, who is not an affiliate or associate or representative of the Interested Stockholder and was a member of the Board prior to the time that the Interested Stockholder became an Interested Stockholder, and any successor thereto, while such successor is a member of the Board, who is not an affiliate or associate or representative of the Interested Stockholder and is recommended or elected to succeed the Continuing Director by a majority of Continuing Directors.

Amendment of Certain Provisions of the Certificate of Incorporation and By-Laws

Under the DGCL, the stockholders of a corporation have the right to adopt, amend or repeal the by-laws and, with the approval of the board of directors, the certificate of incorporation of a corporation. In addition, if the certificate of incorporation so provides, the by-laws may be adopted, amended or repealed by the board of directors. The Amended and Restated Certificate provides that the By-Laws may be amended by the Board or by the stockholders of the Company.

The Amended and Restated Certificate also provides that any proposal to amend or repeal, or adopt any provision inconsistent with, the provisions of the Amended and Restated Certificate regarding Business Combinations proposed by or on behalf of an Interested Stockholder or affiliate thereof requires (at a minimum) the affirmative vote of the holders of at least 66 2/3 percent of the votes entitled to be cast by holders of the outstanding Voting Shares, excluding Voting Shares beneficially owned by any Interested Stockholder, unless the proposal is unanimously recommended by the Board and each director qualifies as a Continuing Director. Approval by the Board, together with the affirmative vote of the holders of a majority in voting power of the outstanding Voting Shares, is required to amend all other provisions of the Amended and Restated Certificate.

The Business Combination supermajority voting requirement could have the effect of making more difficult any amendment by stockholders of the Business Combination provisions of the Amended and Restated Certificate described above, even if a majority of the stockholders of the Company believe that such amendment would be in their best interest.

Antitakeover Legislation

Section 203 of the DGCL provides that, subject to certain exceptions specified herein, a corporation shall not engage in any "business combination" with any "interested stockholder" for a three-year period following the time that such stockholder becomes an interested stockholder unless:

(i) prior to such time, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;

(ii) upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85 percent of the voting stock of the corporation outstanding at the time the transaction commenced (excluding certain shares); or

(iii) on or subsequent to such time the business combination is approved by the board of directors of the corporation and authorized at any annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66 2/3 percent of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 of the DGCL generally defines an "interested stockholder" to include (x) any person that is the owner of 15 percent or more of the outstanding voting stock of the corporation, or is an affiliate or associate of the corporation and was the owner of 15 percent or more of the outstanding voting stock of the corporation at any time within three years immediately prior to the relevant date and (y) the affiliates and associates of any such person.

Section 203 of the DGCL generally defines a "business combination" to include (1) any merger or consolidation involving the corporation and the interested stockholders; (2) any merger, sale or other disposition of 10 percent or more of the assets of the corporation with or to an interested stockholder; (3) subject to certain exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder; (4) any transaction which would result in increasing the proportionate share of the stock of the corporation or its subsidiaries owned by the interested stockholder; and (5) the receipt by the interested stockholder of the benefit (except proportionately as a stockholder) of any loans, advances, guarantees, pledges, or other financial benefits.

Under certain circumstances, Section 203 of the DGCL makes it more difficult for a person who would be an interested stockholder to effect various business combinations with a corporation for a three-year period, although a certificate of incorporation or stockholder-adopted by-laws may exclude a corporation from the restrictions imposed thereunder. Neither the Amended and Restated Certificate nor the By-Laws exclude the Company from the restrictions imposed upon Section 203 of the DGCL. It is anticipated that the provisions of Section 203 of the DGCL may encourage companies interested in acquiring the Company to negotiate in advance with the Board since the stockholder approval requirement would be avoided if the Board approves, prior to the time the stockholder becomes an interested stockholder, either the business combination or the transaction which results in the stockholder becoming an interested stockholder.

Transfer Agent and Registrar

The Transfer Agent and Registrar for our common stock is EQ Shareowner Services. Its address is 1110 Centre Pointe Curve, Suite 101, Mendota Heights, MN 55120.

Listing on The New York Stock Exchange

The Class A Common Stock is listed on the New York Stock Exchange under the symbol "TEN."

EXHIBIT 10.5

DRiV INCORPORATED
SUPPLEMENTAL RETIREMENT PLAN
(Effective as of January 1, 2020)

1. History, Purpose and Effective Date. The Tenneco Automotive Inc. Supplemental Retirement Plan (the "Plan") was established effective as of January 1, 2005 by Tenneco Inc. (known as Tenneco Automotive Inc. prior to October 28, 2005, "Tenneco"). The Plan was maintained as an unfunded plan for the purpose of providing retirement benefits with respect to certain salaried employees that are equal to retirement benefits lost under the Tenneco Employees Retirement Plan (previously known as the Tenneco Automotive Inc. Retirement Plan for Salaried Employees, the "Tenneco Retirement Plan") as a result of the imposition of the limitations contained in the Internal Revenue Code of 1986, as amended (the "Code"). The portion of the Plan that provides for benefits limited by Code Section 415 was maintained as an "excess benefit plan" as described in Section 3(36) of the Employee Retirement Income Security Act of 1974, as amended ("ERISA"). The other benefits provided for under the Plan were only available to a "select group of management or highly compensated employees" as determined by the committee that was then known as the Compensation/Nominating/ Governance Committee of the Board of Directors of the Company (the "Committee"), and the portion of the Plan providing such benefits was intended to satisfy the ERISA exemption requirements for a plan limited to such group. Benefits under the Plan were frozen effective as of December 31, 2006, no person became a Participant in the Plan after December 31, 2006, no compensation or service (for purposes of benefit accrual) for periods after December 31, 2006 has been or shall be taken into account under the Plan, and no person accrued or shall accrue any additional benefits under the Plan after December 31, 2006. Effective as of January 1, 2020 (the "Effective Date"), DRiV Incorporated (the "Company"), assumed sponsorship of, and all rights, powers duties and obligations of Tenneco under and with respect to, the Plan. Capitalized terms set forth herein that are not otherwise defined shall have the meaning set forth in the DRiV Employees Retirement Plan (the "Retirement Plan"). The following provisions constitute an amendment, restatement, and continuation of the Plan in the form of "DRiV Incorporated Supplemental Retirement Plan". For the avoidance of doubt, the purpose of the amendment and restatement of the Plan is to reflect the assumption of the Plan by the Company. From and after the Effective Date, the Committee under the Plan shall refer to the Compensation Committee of the Board of Directors of the Company.

2. Eligibility. As of the Effective Date, the Plan shall remain frozen and no person shall become eligible to participate in the Plan or become a Participant in the Plan after the Effective Date.

3. Amount of Benefit. The benefit payable under the Plan to a Participant, or the Participant's Eligible Spouse, Eligible Child(ren) or other eligible beneficiary(ies), all as determined under the provisions of the Retirement Plan (the "Plan Benefit"), shall equal the excess, if any, of (a) over (b) where:

(a) is the benefit that would be paid under the Retirement Plan if the provisions of the Retirement Plan were administered without regard to the limitations imposed by the Code and, only with respect to Participants who, at any time, were executive incentive level participants in Tenneco's Value Added "TAVA" Incentive Compensation Plan (the "TAVA Plan"), if Final Average Compensation, as computed under the Retirement Plan, were determined on the basis of compensation paid during the three calendar years (of the five calendar year period ending no later than the calendar year immediately preceding his or her termination or retirement) for which such compensation is the highest, and increased by the quotient of (i) the total of the cash bonuses, as defined below, paid to the Participant in the three calendar years (during the same five calendar year period ending no later than the calendar year immediately preceding his or her termination or retirement) for which such total is the highest, divided by (ii) three or such lesser number of calendar years (included in such period) in which such bonuses were paid to the Participant; provided, that the calendar year including his or her termination or retirement shall be included if such event follows the payment of regular bonuses for that year; and provided, that bonuses and salary, respectively, deferred at the election of the Participant shall be counted only in the year that they would have been paid absent such election, and provided, further, that the foregoing language shall be applied to count bonuses which relate to a calendar year as paid in that year, for example, 2005 bonuses will be counted in 2005 notwithstanding the fact that they are actually paid in 2006; and

(b) is the total benefit that is payable under the Retirement Plan.

Unless otherwise provided in writing, no benefit shall be payable under the Plan unless a benefit also is payable under the Retirement Plan. Cash bonus means only cash bonuses paid under the TAVA Plan and other cash bonuses as the Committee determines. Notwithstanding any other provision of the Plan, the Plan Benefit payable under the Plan to any Participant (or the Participant's Eligible Spouse or Eligible Child(ren) or other eligible beneficiary(ies)) shall be equal to the Participant's Plan Benefit under the Plan immediately prior to the Effective Date.

4. Form of Benefit. The Plan Benefit shall be in the form of a single lump sum payment and shall be payable as soon as practicable after the Participant's separation from service (but in no event prior to the date on which the Participant attains age 55 and has completed at least 10 years of service or age 65 if the Participant has fewer than 10 years of service upon his separation from service); provided, however, that with respect to any Participant who is a 'key employee' as defined by Section 409A(a)(2)(B)(i) of the Code, payment of the Plan Benefit shall be made no earlier than six months from the Participant's separation from service with the Company. The actuarial factors set forth in the Retirement Plan shall be used to compute Plan Benefits, provided that, for purposes of a lump sum payment, the interest rate used shall be the annual rate of interest on 30 year Treasury securities as specified by the IRS for the second calendar month preceding the first day of the plan year during which the annuity starting date occurs, and the applicable mortality table described in Rev. Rul. 95-6, 1995-1 C.B., or in such other formal guidance as may be issued from time to time by the IRS.

5. Unfunded Plan. The Plan shall be maintained as an unfunded non-qualified deferred compensation plan. All benefits under this Plan shall be payable from the general assets of the Company and its affiliates. No person shall be entitled to receive any benefits under this Plan from the funds of the Retirement Plan.

6. No Assignment. No benefit under this Plan shall be assignable or alienable or subjected, by attachment or otherwise, to the claims of creditors of any person.

7. No Guarantee of Employment. This Plan shall not be construed to give any Participant the right to be retained in the employment of the Company or any of its affiliates.

8. Operation and Administration. This Plan shall be operated under the direction of and administration of the Committee. The Committee shall have the sole and complete authority and discretion to interpret the terms and provisions of the Plan and to adopt, alter and repeal such administrative rules, regulations and practices governing the operation of the Plan, and to determine facts under the Plan as it shall from time to time deem advisable. The Committee's decision in all matters involving the interpretation and application of this Plan shall be final and binding. The Committee shall establish a claims procedure which is consistent with the claims procedures employed under the Retirement Plan.

9. Governing Law. To the extent not preempted by federal law, this Plan shall be construed, administered and enforced in accordance with the laws of the State of Illinois.

10. Amendment and Discontinuance. The Company reserves the right, by action of the Committee, to amend or discontinue the Plan; provided, however, that no such amendment or discontinuance shall impair or adversely affect any benefits accrued under this Plan as of the date of such action.

11. Supplements and Special Provisions. The provisions of the Plan as applied to any group of Participants may be modified or supplemented from time to time by the adoption of one or more Supplements. Each Supplement shall form a part of the Plan as of the Supplement's effective date. In the event of any inconsistency between a Supplement and the Plan document, the terms of the Supplement shall govern.

12. Special Section 409A Provisions. It is intended that the Plan comply with the provisions of section 409A of the Code and all provisions of the Plan shall be construed and interpreted in accordance with the requirements of section 409A of the Code and applicable guidance thereunder. Notwithstanding any other provision of this Plan to the contrary, if any payment or benefit hereunder is subject to section 409A of the Code, and if such payment or benefit is to be paid or provided on account of the Participant's termination of employment (or other separation from service):

(a) and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment or benefit is required to be made or provided prior to the first day of the seventh month following the Participant's separation from service or termination of employment, such payment or benefit shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service (or, if earlier, on death); and

(b) the determination as to whether the Participant has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

Pursuant to the authority granted to the undersigned, effective as of January 1, 2020, the undersigned officer, on behalf of and in the name of the Company, hereby adopts this amended and restated DRiV Incorporated Supplemental Retirement Plan.

Date: December 20, 2019 DRiV Incorporated

By /s/ Kaled Awada

Its Kaled Awada

EXHIBIT 10.32

October 1, 2018

Mr. Rainer Jueckstock
[Address]

Dear Rainer:

The purpose of this letter is to document the terms of Tenneco Inc.'s ("Tenneco") offer of employment effective as of the closing of Tenneco's acquisition of Federal-Mogul (the "Closing").

The key terms of Tenneco's offer of employment are described below.

1. **Position**: Your employment with Tenneco (and its affiliates) will commence effective as of the Closing as Tenneco's Executive Vice President and President Powertrain and, following the successful completion of Tenneco's previously announced intention to separate into two independent publicly traded companies (the "Spinoff"), you will continue in those positions with the future "Powertrain Technology" company (Tenneco Clean Air and Federal-Mogul Powertrain). You will report to Roger Wood, who, immediately following the Closing, will be the Co-Chief Executive Officer of Tenneco and, immediately following the Spinoff, will be the Chairman and Chief Executive Officer of the future Powertrain Technology company. Your reporting relationships will be to a position, not an individual.
2. **Base Salary:** Your initial base salary will be $950,000 per year ($79,166.67 per month) less appropriate taxes and withholding, paid in accordance with Tenneco's normal payroll practices. Beginning in 2020 and each year thereafter, your base salary will be reviewed and, in turn, may be adjusted, subject to approval by the Compensation Committee of Tenneco's Board of Directors (the "Compensation Committee").
3. **Annual Incentive Compensation:** Your target bonus opportunity for the 2018 calendar year will remain at 120% of your annual base salary (or $1,140,000). The 2018 bonus will be determined and payable on the same terms and conditions as would have applied under the Federal-Mogul bonus plan as in effect prior to the Closing, including satisfaction of any applicable performance criteria. Beginning January 1, 2019, you will be eligible to participate in Tenneco's executive annual incentive plan in a manner consistent with other Tenneco executives. The terms of the annual incentive plan are set forth in the Tenneco Inc. Annual Incentive Plan ("AIP" - copy attached). Your initial target bonus opportunity for the 2019 calendar year performance period under the AIP will be 90% of your annual base salary ($855,000 based on the offered salary) although the actual value will be determined by the Compensation Committee. The payment of an annual incentive to you under the AIP is subject to achievement of pre-defined performance goals for the company, the approval by the Compensation Committee, as well as the terms of the AIP (or successor plan).
4. **Long-Term Incentive Compensation:** Your long-term incentive compensation ("LTI") will be subject to the following:
   a. Your outstanding LTI granted by Federal-Mogul for the period 2016-2018 will remain in effect through December 31, 2018 in accordance with its terms.
   b. Your outstanding LTI granted by Federal-Mogul for the periods 2017-2019 and 2018-2020 will be adjusted in accordance with the applicable plans to reflect Tenneco's acquisition of Federal-Mogul and the Spinoff.
   c. Beginning in 2019, you will be eligible to participate in Tenneco's LTI plan in a manner consistent with other similarly-situated Tenneco executives. The terms of the LTI plan are set forth in the Tenneco Long-Term Incentive Plan, as amended, a copy of which is attached. Each year the Compensation Committee will determine and approve the mix of LTI awards that will be granted to you and the aggregate target value of these awards. Your first eligibility for a full LTI award will be in February 2019. The final award size, award type, performance conditions and other terms of this award will be approved by the Compensation Committee in February 2019 at the same time the terms of these awards are established for other executives at the company. Your 2019 LTI award is currently estimated to have a $1,450,000 value.
5. **Health, Welfare and Retirement Benefits:** For the remainder of calendar year 2018, you will continue to participate in the health, welfare and retirement plans in which you participate immediately prior to the Closing, subject to the terms and conditions of such plans. Effective as of January 1, 2019, you will be eligible to participate in Tenneco's broad-based health and welfare and defined contribution retirement plans in a manner consistent with other Tenneco executives although you have indicated that you are going to waive participation in the defined contribution retirement plan. This letter will constitute an irrevocable waiver of your participation in the defined contribution plan and other qualified retirement plans of Tenneco and its affiliates in the future. Please refer to benefit plan documents for specific terms and eligibility. The company reserves the right to change these benefit programs and any of our other benefit

programs. You will not be eligible to participate in any Tenneco nonqualified retirement plans, such as the Excess Benefit Plan and the SERP.

6. **Vacation and holiday paid time off:** You will be entitled to a total of four weeks of paid vacation per year: two weeks in accordance with the provisions of the company's vacation policy and two additional negotiated weeks. Your vacation accrual will thereafter increase only in accordance with the vacation schedule in the policy, taking into account your service with Federal-Mogul as of the Closing. In addition, the company is typically closed during the week between Christmas and New Year's Day holidays. You will also be eligible for paid holidays and personal floating holidays in accordance with the company's policies. When you leave employment with Tenneco, you will receive a payment for any vacation you have accrued and not used. Vacation is prorated to your date of employment and accrued on a monthly basis; provided, however, that you will retain any accrued but unpaid vacation that you have as of the Closing.
7. **Special Benefits.**
    a. For the period commencing on your employment commencement date and ending on December 31, 2018, you will continue to receive an automobile allowance based on an annual amount of $32,000, prorated for the remainder of the 2018 year. You will not be entitled to this benefit after calendar year 2018.
    b. The company will make contributions to the German pension plan that covers you immediately prior to the Closing in an amount of up to €125,000 per annum. This contribution will typically be made in the first quarter of the year following the year to which such contribution relates (e.g., the contribution for 2018 typically will be made in the first quarter of 2019).
8. **Severance Through December 31, 2018:** For the remainder of calendar year 2018, you will continue to be eligible to participate in the Federal-Mogul LLC Change in Control and Severance Plan (the "F-M CIC Severance Plan") and the Federal-Mogul LLC Severance Plan for Salaried Employees (the "F-M Severance Plan") in accordance with their terms; provided, however, that you hereby agree to waive all of your rights under and with respect to the F-M CIC Severance Plan and the F-M Severance Plan (and any other agreements with Federal-Mogul) to terminate employment for "good reason" or "constructive discharge" or "constructive termination" (or terms of similar import) and to receive payments and benefits thereunder after the Closing on account of any such termination. Your eligibility for severance payments and benefits after December 31, 2018 are described below.
9. **Change-In-Control (CIC) Protection:** You will be eligible to participate in Tenneco's Change-In-Control Severance Benefit Plan for Key Executives (the "CIC Plan") effective as of January 1, 2019. Benefits under the CIC Plan are payable if you are discharged (either actually or constructively) within two years after a change-in-control that occurs after the effective date of your employment. The CIC Plan generally provides a lump-sum payment equal to two times base salary and targeted annual bonus in effect immediately prior to the change-in-control for Group II level participants. Continuing participation in certain insurance plans and outplacement services are also provided.
10. **Severance (not related to CIC):** You will be eligible to participate in the Tenneco Automotive Operating Company Inc. Severance Benefit Plan (the "Severance Plan") effective as of January 1, 2019. Benefits are payable under the Severance Plan if you are discharged by the company other than for Cause or if you terminate due to Constructive Termination (and, in any case, other than under circumstances which would entitle you to benefits under the CIC Plan). The Severance Plan generally provides a lump-sum payment equal to one times base salary and targeted annual bonus for the year in which the termination occurs for Group I participants, subject to your execution of a general release and such other documents as the company may reasonably request. The Severance Plan also provides a medical coverage subsidy in certain cases and outplacement benefits. "Cause" and "Constructive Termination" have the meanings specified in the Severance Plan.
11. **Stock Ownership Guidelines:** Upon employment, you will be subject to Tenneco's stock ownership guideline policy, requiring that you hold qualifying shares of Tenneco equal to three times base salary, to be attained by the first month of January following five years of employment.
12. **Insider Trading Policy:** Upon employment, you will be subject to Tenneco's Insider Trading Policy, which, among other things, limits the timing and types of transactions you may make with respect to Tenneco securities and related derivatives.
13. **Employment at Will:** This offer does not constitute a contract of employment for any specific period of time, but will create an employment at-will relationship that may be terminated at any time by you or the company, with or without cause.
14. **Effect on Other Arrangements:** The foregoing terms and conditions of employment supersede all prior agreements between you and Federal-Mogul Corporation, Federal-Mogul LLC and/or any of their affiliates, including your Employment Agreement dated April 1, 2012, as amended (the "Employment Agreement"), relating to the subject matter of this letter. In addition, in your new position and for periods after December 31, 2018, you will not be eligible to participate in (or receive benefits under) the F-M CIC Severance Plan or the F-M Severance Plan but instead you will be eligible to participate in Tenneco severance plans as described above. By accepting this offer, you hereby agree (a) that you hereby waive your participation in, and all of your rights under and with respect to, the F-M CIC Severance Plan and the F-M Severance Plan (including any rights to payments or benefits), effective for periods after December

31, 2018, (b) you hereby waive your rights under and with respect to the F-M CIC Severance Plan, the F-M Severance Plan and any other agreements with Federal-Mogul to terminate employment for "good reason" or "constructive discharge" or "constructive termination" (or terms of similar import) and to receive payments and benefits thereunder on account of any such termination (as described in Section 8), effective as of the Closing, (c) that this letter constitutes a termination of your participation in the F-M CIC Severance Plan and the F-M Severance Plan along with any other agreements with Federal-Mogul pertaining to your compensation and/or employment (other than specifically described herein), effective as of the Closing, and (d) that this letter constitutes a termination of the Employment Agreement effective as of the Closing. The foregoing waivers and termination will be effective as of the Closing except as expressly provided herein.

Your offer is contingent upon the verification of the information you have provided to the company, successful completion of employment paperwork and execution of the Tenneco Confidentiality Agreement (this will be part of your "on-boarding" process).

Two copies of this offer letter have been provided. Please sign the offer letter and return it to me as soon as possible. The second copy should be retained for your personal records.

Rainer, we look forward to you joining Tenneco and are excited for you to contribute and share in its future success. Please contact me to acknowledge your acceptance or with any other questions or concerns.

Sincerely,

/s/ Gregg A. Bolt

Gregg A. Bolt
Senior Vice President
Tenneco Automotive Operating Company Inc., a Tenneco company

I have read, understand and accept this offer of employment effective as of the Closing. In particular, I understand and knowingly agree to the provisions of Section 14 hereof relating to my waiver of rights under and with respect to, and termination of participation in, benefit plans.

In addition, effective as of the Closing, I hereby make an irrevocable election to have no contributions made to the Tenneco 401(k) Retirement Savings Plan or any such other plan or arrangement sponsored by Tenneco and its affiliates that is tax-qualified under section 401(a) of the U.S. Internal Revenue Code of 1986, as amended (the "Code", or as otherwise described in section 219(g)(5)(A) of the Code).

By: /s/ Rainer Jueckstock Date: 10/03/2018

Print Name: Rainer Jueckstock

EXHIBIT 10.33

October 1, 2018

Mr. Brad Norton
[Address]

Dear Brad:

The purpose of this letter is to document the terms of Tenneco Inc.'s ("Tenneco") offer of employment effective as of the closing of Tenneco's acquisition of Federal-Mogul (the "Closing").

The key terms of Tenneco's offer of employment are described below.

1. **Position**: Your employment with Tenneco (and its affiliates) will commence effective as of the Closing as Tenneco's Executive Vice President and President Original Equipment and, following the successful completion of Tenneco's previously announced intention to separate into two independent publicly traded companies (the "Spinoff"), you will continue in this position with the future "Aftermarket and Ride Performance" company. You will report to Brian Kesseler, who, immediately following the Closing, will be the Co-Chief Executive Officer of Tenneco and, immediately following the Spinoff, will be the Chairman and Chief Executive Officer of the future Aftermarket and Ride Performance company.

2. **Base Salary:** Your initial base salary will be $700,000 per year ($58,333.33 per month) less appropriate taxes and withholding, paid in accordance with Tenneco's normal payroll practices. Beginning in 2020 and each year thereafter, your base salary will be reviewed and, in turn, may be adjusted, subject to approval by the Compensation Committee of Tenneco's Board of Directors (the "Compensation Committee").

3. **Annual Incentive Compensation:** Your target bonus opportunity for the 2018 calendar year will remain at 100% of your annual base salary (or $700,000). The 2018 bonus will be determined and payable on the same terms and conditions as would have applied under the Federal-Mogul bonus plan as in effect prior to the Closing, including satisfaction of any applicable performance criteria. Beginning January 1, 2019, you will be eligible to participate in Tenneco's executive annual incentive plan in a manner consistent with other Tenneco executives. The terms of the annual incentive plan are set forth in the Tenneco Inc. Annual Incentive Plan ("AIP" - copy attached). Your initial target bonus opportunity for the 2019 calendar year performance period under the AIP will be 80% of your annual base salary (or $560,000 based on the offered salary) although the actual value will be determined by the Compensation Committee. The payment of an annual incentive to you under the AIP is subject to achievement of pre-defined performance goals for the company, the approval by the Compensation Committee, as well as the terms of the AIP (or successor plan).

4. **Long-Term Incentive Compensation:** Your long-term incentive compensation ("LTI") will be subject to the following:
   a. Your outstanding LTI granted by Federal-Mogul for the period 2016-2018 will remain in effect through December 31, 2018 in accordance with its terms.

   b. Your outstanding LTI granted by Federal-Mogul for the periods 2017-2019 and 2018-2020 will be adjusted in accordance with the applicable plans to reflect Tenneco's acquisition of Federal-Mogul and the Spinoff.

   c. Beginning in 2019, you will be eligible to participate in Tenneco's LTI plan in a manner consistent with other similarly-situated Tenneco executives. The terms of the LTI plan are set forth in the Tenneco Long-Term Incentive Plan, as amended, a copy of which is attached. Each year the Compensation Committee will determine and approve the mix of LTI awards that will be granted to you and the aggregate target value of these awards. Your first eligibility for a full LTI award will be in February 2019. The final award size, award type, performance conditions and other terms of this award will be approved by the Compensation Committee in February 2019 at the same time the terms of these awards are established for other executives at the company. Your 2019 LTI award is currently estimated to have a $1,100,000 value.

5. **Health, Welfare and Retirement Benefits:** For the remainder of calendar year 2018, you will continue to participate in the health, welfare and retirement plans in which you participate immediately prior to the Closing, subject to the terms and conditions of such plans. Effective as of January 1, 2019, you will be eligible to participate in Tenneco's broad-based health and welfare plans and Tenneco's 401(k) Plan in a manner consistent with other similarly-situated executives of the company. The 401(k) plan will provide a 100% company match on your first 3%, and 50% of your next 2%, of base pay contributions and we expect that it will provide a base pay company retirement contribution of between 2.5% and 4% of salary (depending on your age at the relevant time and after you have completed a year of service, taking into account your Federal-Mogul service as of the Closing), subject to 401(k) Plan and IRS maximums. Please refer to benefit plan documents for specific terms and eligibility. The company reserves the right to change these benefit programs and any of our other benefit programs. Effective as of January 1, 2019, you will also be eligible to participate in Tenneco's Excess Benefit Plan which we expect will provide you with a benefit of between 2.5% and 4.0% of your bonus compensation and matching contributions and company retirement contributions at the rate applicable under the plan on your compensation in excess of the IRS limitation on compensation under section 401(a)(17) of the Internal Revenue Code.

6. **Vacation and holiday paid time off:** You will be entitled to a total of four weeks of paid vacation per year: two weeks in accordance with the provisions of the company's vacation policy and two additional negotiated weeks. Your vacation accrual will thereafter increase only in accordance with the vacation schedule in the policy, taking into account your service with Federal-Mogul as of the Closing. In addition, the company is typically closed during the week between Christmas and New Year's Day holidays. You will also be eligible for paid holidays and personal floating holidays in accordance with the company's policies. When you leave employment with Tenneco, you will receive a payment for any vacation you have accrued and not used. Vacation is prorated to your date of employment and accrued on a monthly basis; provided, however, that you will retain any accrued but unpaid vacation that you have as of the Closing.

7. **Automobile Allowance:** You will continue to receive an automobile allowance through December 31, 2018. You will not be entitled to this benefit after calendar year 2018.

8. **Severance Through December 31, 2018:** For the remainder of calendar year 2018, you will continue to be eligible to participate in the Federal-Mogul LLC Change in Control and Severance Plan (the "F-M CIC Severance Plan") and the Federal-Mogul LLC Severance Plan for Salaried Employees (the "F-M Severance Plan") in accordance with their terms; provided, however, that you hereby agree to waive all of your rights under and with respect to the F-M CIC Severance Plan and the F-M Severance Plan (and any other agreements with Federal-Mogul) to terminate employment for "good reason" or "constructive discharge" or "constructive termination" (or terms of similar import) and to receive payments and benefits thereunder after the Closing on account of any such termination. Your eligibility for severance payments and benefits after December 31, 2018 are described below.

9. **Change-In-Control (CIC) Protection:** You will be eligible to participate in Tenneco's Change-In-Control Severance Benefit Plan for Key Executives (the "CIC Plan") effective as of January 1, 2019. Benefits under the CIC Plan are payable if you are discharged (either actually or constructively) within two years after a change-in-control that occurs after the effective date of your employment. The CIC Plan generally provides a lump-sum payment equal to two times base salary and targeted annual bonus in effect immediately prior to the change-in-control for Group II level participants. Continuing participation in certain insurance plans and outplacement services are also provided.

10. **Severance (not related to CIC):** You will be eligible to participate in the Tenneco Automotive Operating Company Inc. Severance Benefit Plan (the "Severance Plan") effective as of January 1, 2019. Benefits are payable under the Severance Plan if you are discharged by the company other than for Cause or if you terminate due to Constructive Termination (and, in any case, other than under circumstances which would entitle you to benefits under the CIC Plan). The Severance Plan generally provides a lump-sum payment equal to one times annual base salary and targeted annual bonus for the year in which the termination occurs for Group I participants, subject to your execution of a general release and such other documents as the company may reasonably request. The Severance Plan also provides a medical coverage subsidy in certain cases and outplacement benefits. "Cause" and "Constructive Termination" have the meanings specified in the Severance Plan.

11. **Stock Ownership Guidelines:** Upon employment, you will be subject to Tenneco's stock ownership guideline policy, requiring that you hold qualifying shares of Tenneco equal to three times base salary, to be attained by the first month of January following five years of employment.

12. **Insider Trading Policy:** Upon employment, you will be subject to Tenneco's Insider Trading Policy, which, among other things, limits the timing and types of transactions you may make with respect to Tenneco securities and related derivatives.

13. **Employment at Will:** This offer does not constitute a contract of employment for any specific period of time, but will create an employment at-will relationship that may be terminated at any time by you or the company, with or without cause.

14. **Effect on Other Arrangements:** The foregoing terms and conditions of employment supersede all prior agreements between you and Federal-Mogul Corporation, Federal-Mogul LLC and/or any of their affiliates relating to the subject matter of this letter. In addition, in your new position and for periods after December 31, 2018, you will not be eligible to participate in (or receive benefits under) the F-M CIC Severance Plan or the F-M Severance Plan but instead you will be eligible to participate in Tenneco severance plans as described above. By accepting this offer, you hereby agree (a) that you hereby waive your participation in, and all of your rights under and with respect to, the F-M CIC Severance Plan and the F-M Severance Plan (including any rights to payments or benefits), effective for periods after December 31, 2018, (b) you hereby waive your rights under and with respect to the F-M CIC Severance Plan, the F-M Severance Plan and any other agreements with Federal-Mogul to terminate employment for "good reason" or "constructive discharge" or "constructive termination" (or terms of similar import) and to receive payments and benefits thereunder on account of any such termination (as described in Section 8), effective as of the Closing, and (c) that this letter constitutes a termination of your participation in the F-M CIC Severance Plan and the F-M Severance Plan along with any other agreements with Federal-Mogul pertaining to your compensation and/or employment (other than specifically described herein), effective as of the Closing. The foregoing waivers and termination will be effective as of the Closing except as expressly provided herein.

Your offer is contingent upon the verification of the information you have provided to the company, successful completion of employment paperwork and execution of the Tenneco Confidentiality Agreement (this will be part of your "on-boarding" process).

Two copies of this offer letter have been provided. Please sign the offer letter and return it to me as soon as possible. The second copy should be retained for your personal records.

Brad, we look forward to you joining Tenneco and are excited for you to contribute and share in its future success. Please contact me to acknowledge your acceptance or with any other questions or concerns.

Sincerely,

/s/ Kaled Awada

Kaled Awada
Senior Vice President and Chief Human Resources Officer
Tenneco Automotive Operating Company Inc., a Tenneco company

I have read, understand and accept this offer of employment effective as of the Closing. In particular, I understand and knowingly agree to the provisions of Section 14 hereof relating to my waiver of rights under and with respect to, and termination of participation in, benefit plans.

By: /s/ Bradley S. Norton Date: Oct. 2, 2018

Print Name: Bradley S. Norton

EXHIBIT 10.35

TENNECO
EXCESS BENEFIT PLAN

(As Amended and Restated Effective as of January 1, 2020)

SECTION 1

GENERAL

1.1. History, Purpose and Effective Date. Tenneco Inc. previously adopted the Tenneco Inc. Excess Benefit Plan, effective as of January 1, 2007, to provide benefits to eligible employees of the Company and the Employers (as defined in subsection 1.2) whose benefits under the Tenneco 401(k) Retirement Savings Plan are limited as the result of certain limitations of the Internal Revenue Code of 1986, as amended (the "Code"), and as a result of the compensation that is taken into account under such plan for contribution purposes. The Plan was amended and restated effective as of January 1, 2013 and has been further amended. Effective as of January 1, 2020, certain liabilities under the Plan were transferred to the DRiV Incorporated Excess Benefit Plan (the "DRiV Plan") as described in Section 4 hereof. The following provisions constitute an amendment, restatement and continuation of the Tenneco Excess Benefit Plan (the "Plan") effective as of January 1, 2020 (the "Effective Date"). The Plan is intended to constitute an unfunded plan maintained primarily for the purpose of providing deferred compensation for a select group of management or highly compensated employees. The Plan is intended to comply with section 409A of the Internal Revenue Code of 1986, as amended (the "Code") and will be interpreted and administered in accordance therewith.

1.2. Employers and Related Companies. Tenneco Automotive Operating Company Inc. (the "Company") and any Related Company which, with the consent of the Company, adopts the Plan are referred to below collectively as the "Employers" and individually as an "Employer". The term "Related Company" means any corporation or trade or business during any period that it is, along with the Company, a member of a controlled group of trades or businesses within the meaning of sections 414(b) and (c) of the Code. As of the Effective Date, without any further action of any person, (a) Tenneco Automotive Operating Company will continue as an Employer under the Plan and (b) neither DRiV Incorporated ("DRiV") nor any of its subsidiaries shall be Employers under the Plan. Other Employers, if applicable, are set forth on Schedule 1 hereof.

1.3. Plan Administration. The authority to control and manage the operation and administration of the Plan will be vested in the committee or committees established by the Company with the authority to take administrative actions under and with respect to the Plan (the "Administrative Committee"). In controlling and managing the operation and administration of the Plan, the Administrative Committee will have full and discretionary power and authority to conclusively interpret and construe the provisions of the Plan, to determine the amount of benefits and the rights or eligibility of employees or Participants under the Plan and to establish a claims procedure, and will have such other powers and authorities as may be necessary to discharge its duties hereunder. Any interpretation of the Plan and any decision made by the Administrative Committee on any matter within the discretion of the Administrative Committee shall be binding on all persons. A misstatement or other mistake of fact shall be corrected when it becomes known, and the Administrative Committee shall make such adjustment on account thereof as it considers equitable and practicable. The Administrative Committee may delegate such of its ministerial or discretionary duties and functions as it may deem appropriate to any employee or group of employees of any Employer. Notwithstanding the foregoing, no member of the Administrative Committee may decide any matter relating to his or her own benefits under the Plan.

1.4. Source of Benefit Payments. Benefits payable under the Plan by any Employer will be paid from the general revenues and assets of such Employer and no Employer will be required to set up a funded reserve or otherwise set aside specific funds for the payment of its obligations under the Plan. None of the individuals entitled to benefits under the Plan will have any claim on, or any beneficial ownership interest in, any assets of any Employer, and any rights of such individuals under the Plan will constitute unsecured contractual rights only.

1.5. Applicable Laws. The Plan will be construed and administered in accordance with the internal laws of the State of Michigan to the extent that such laws are not preempted by the laws of the United States of America.

1.6. Gender and Number. Where the context admits, words in any gender will include any other gender, words in the singular will include the plural and the plural will include the singular.

1.7. Plan Year. The Plan Year shall be the calendar year.

1.8. Supplements. The provisions of the Plan as applied to any Employer, to any group of employees of any Employer may, with the consent of the Company, be modified or supplemented from time to time by the adoption of one or more Supplements. Each Supplement shall form a part of the Plan as of the Supplement's effective date. In the event of any inconsistency between a Supplement and the Plan document, the terms of the Supplement shall govern.

SECTION 2

PARTICIPATION

2.1 Eligibility for Participation. The Compensation Committee of the Board of Directors of the Company (the "Compensation Committee") shall determine those employees of the Employers who will be eligible to participate in the Plan for a Plan Year; provided, however, that unless otherwise provided by the Compensation Committee, an employee of an Employer with a designation of EICP 1 or higher (other than any such employee who is specifically excluded from participation by the Compensation Committee) shall be eligible to participate in the Plan (each an "Eligible Employee"). Once an individual has been designated as an Eligible Employee, he shall remain as an Eligible Employee as long as he continues to be employed by the Employers or, if earlier, the first day of the first Plan Year following the date as of which he is no longer designated EICP 1 or higher.

2.2 Effective Date of Participation; Reemployment. Each person who is an Eligible Employee as of the first day of a Plan Year shall become a "Participant" in the Plan as of the first day of the Plan Year. If a person becomes an Eligible Employee after the first day of a Plan Year, he shall become a "Participant" in the Plan as of the first day on which he is an Eligible Employee. Once an individual becomes a Participant in the Plan for a Plan Year, he shall remain a Participant for the entire Plan Year (or portion thereof); provided, however, that an individual's participation in the Plan for a Plan Year shall end as of his Termination Date (as defined in subsection 5.1(a)) except as provided in Section 3. Notwithstanding the foregoing, if a Participant's Termination Date occurs during a Plan Year and he is employed or reemployed by an Employer or Related Company prior to the last day of the Plan Year, he shall immediately become a Participant upon his reemployment.

2.3 Restricted Participation. During any period that a Participant continues in the employ of an Employer or a Related Company but is not an Eligible Employee and during any period for which no Employer Deferred Contributions (as defined in subsection 3.2) are made with respect to the Participant, the Participant, or in the event of his death, his beneficiary, will be considered and treated as a Participant for all purposes of the Plan except for purposes of Section 3.

2.4 Plan Not Contract of Employment. The Plan does not constitute a contract of employment or continued service, and nothing in the Plan will give any Participant the right to be retained in the employ of any Employer, nor any right or claim to any benefit under the Plan, except to the extent specifically provided under the terms of the Plan.

SECTION 3

ACCOUNTS AND CONTRIBUTIONS

3.1. Participant Accounts. The Administrative Committee shall maintain a bookkeeping "Account" in the name of each Participant to reflect such Participant's interest under the Plan.

3.2. Contributions.

(a) Participant Contributions. Participants are not required or permitted to make any contributions under the Plan.

(b) Employer Bonus Contributions. Each Employer shall make contributions to the Plan for each Plan Year ("Employer Bonus Contributions") on behalf of each of its employees who is a Participant for such Plan

Year who was paid a bonus (or who would have been paid a bonus but for a deferral election related to such bonus) under the Company's annual performance bonus plan (currently known as the Tenneco Inc. Annual Incentive Plan) (the "Bonus") from an Employer for such Plan Year. The amount of the Employer Bonus Contribution made by an Employer for any Plan Year on behalf of any Participant shall be equal to (i) the Company Retirement Contribution percentage that applies to such Participant for such Plan Year under the Tenneco 401(k) Investment Plan (the "401(k) Plan") (determined as of the first day of the Plan Year (or the date on which the Participant was first eligible to participate in the 401(k) Plan for such Plan Year, if later), without regard to any changes in such percentage during the Plan Year), multiplied by (ii) the Bonus. Employer Bonus Contributions shall be credited to the applicable Participants' Accounts in accordance with subsection 5.1.

(c) Employer Retirement Contributions. Each Employer shall make contributions to the Plan for each Plan Year ("Employer Retirement Contributions") on behalf of each of its employees who is a Participant in the Plan for such Plan Year and whose Company Retirement Contributions under the 401(k) Plan for such Plan Year are limited for such Plan Year by the limitations of section 401(a)(17) of the Code. The amount of Employer Retirement Contributions made by any Employer for any Plan Year on behalf of any Participant shall be equal to (i) the Company Retirement Contribution percentage that applies to such Participant for such Plan Year under the 401(k) Plan (determined as of the first day of the Plan Year (or the date on which the Participant was first eligible to participate in the 401(k) Plan for such Plan Year, if later) without regard to any changes in such percentage during the Plan Year), multiplied by (ii) the Participant's Compensation (as defined in the 401(k) Plan for purposes of Company Retirement Contributions thereunder, but without regard to the limitations of section 401(a)(17) of the Code) for such Plan Year in excess of the limitations of section 401(a)(17) of the Code for such Plan Year. Employer Retirement Contributions shall be credited to the applicable Participants' Accounts in accordance with subsection 5.1.

(d) Employer Matching Contributions. Each Employer shall make contributions to the Plan for each Plan Year ("Employer Matching Contributions") on behalf of each of its employees who is a Participant in the Plan for such Plan Year, who has made the maximum permitted salary deferrals to the 401(k) Plan for such Plan Year, who is employed by the Employer on the last day of the Plan Year and whose Enhanced Company Match Contributions under the 401(k) Plan for such Plan Year are limited for such Plan Year by the limitations of section 401(a)(17) of the Code. The amount of Employer Matching Contribution made by any Employer for any Plan Year on behalf of any Participant shall be equal to the difference (but not less than zero) between (i) the maximum Enhanced Company Match Contributions that could have been made on behalf of the Participant under the 401(k) Plan for that year had the limitations of section 401(a)(17) of the Code had not applied minus (ii) the maximum Enhanced Company Match Contributions that could have been made on behalf of the Participant under the 401(k) Plan for that year taking into account the limitations of section 401(a)(17) of the Code. Employer Matching Contributions shall be credited to the applicable Participants' Accounts in accordance with subsection 5.1.

Employer Bonus Contributions, Employer Retirement Contributions and Employer Matching Contributions are sometimes collectively referred to herein as "Employer Deferred Contributions".

SECTION 4

TRANSFERRED PARTICIPANTS AND TRANSFERRED BENEFITS

Effective as of the Effective Date, the account balances of all Transferred Participants (as defined below) shall be transferred to the DRiV Plan. The amount of the benefits transferred from the Plan to the DRiV Plan are referred to herein as "Transferred Benefits". The amount of the Transferred Benefits shall be determined after all adjustments required under the Plan as of (or prior to) December 31, 2019 are completed. For purposes of the Plan, "Transferred Participants" means Participants in the Plan as of December 31, 2019 who are in the following categories:

(a) employees who are employed by the Company or any Related Company immediately prior to the Effective Date ("Active Employees") in connection with the Company's Motorparts business;

(b) Active Employees who are employed in connection with the Company's Ride Performance business;

(c) all participants in the Plan who are not employed by the Company or any Related Company immediately prior to the Effective Date ("Former Employees") and who are designated by the Company and DRiV as former Ride Performance employees;

(d) Active Employees who are designated by the Company and DRiV as DRiV Corporate Staff and DRiV Global Services employees; and

(e) Former Employees who are designated by the Company and DRiV as former Clean Air employees.

Other than the liabilities for Transferred Benefits, all liabilities shall be retained by the Plan. For the avoidance of doubt, the retained liabilities shall include liabilities for Participants in the following categories: (1) Active Employees who were employed immediately prior to the Effective Date in connection with the Company's Clean Air business, (2) Active Employees in the Company's Powertrain business and Former Employees who are designated by the Company and DRiV as former Powertrain employees, (3) Active Employees who are designated by the Company and DRiV as Company Corporate Staff employees, and (4) Former Employees who are designated by the Company and DRiV as former Motorparts employees.

SECTION 5

PLAN ACCOUNTING

5.1 Adjustment of Accounts. Each Participant's Account shall be adjusted in accordance with this Section 5, in a uniform, nondiscriminatory manner, as of each business day on which the New York Stock Exchange is open for business (each an "Accounting Date"). As of each Accounting Date, the balance of each Participant's Account shall be adjusted as follows:

(a) first, charge to the Account balance the amount of any distributions under the Plan with respect to that Account that have not previously been charged;

(b) next, credit to the Account balance the amount of Employer Deferred Contributions made on behalf of the Participant in accordance with Section 3 since the preceding Accounting Date; and

(c) finally, adjust the Account balance for the applicable investment return in accordance with subsection 5.2.

5.2 Investment Return. The following shall apply with respect to amounts credited to a Participant's Account:

(a) Amounts credited to a Participant's Account in accordance with subsection 5.1 shall be adjusted as of each Accounting Date to reflect the value of an investment equal to the Participant's Account balance in one or more assumed investments that the Administrative Committee offers from time to time and communicated to Participants (the "Investment Funds"), and which the Participant directs the Administrative Committee to use for purposes of adjusting his Account. Such amount shall be determined without regard to taxes that would be payable with respect to any such Investment Fund, but will be adjusted for any investment management or similar fee that is customarily paid with respect to the Investment Fund.

(b) To the extent permitted by the Administrative Committee, the Participant may elect to have different portions of his Account balance for any period adjusted on the basis of different Investment Funds and any election by a Participant with respect to an Investment Fund shall be subject to such rules and regulations established from time to time by the Administrative Committee.

(c) Notwithstanding the election by Participants of certain investments in specified Investment Funds and the adjustment of their Accounts based on such investment elections, the Plan does not require, and no trust or other instrument that may be maintained in connection with the Plan shall require, that any assets or amounts that are set aside in trust or otherwise for the purpose of paying Plan benefits shall actually be invested in the investment alternatives selected by Participants.

(d) Any change in the Participant's investment direction shall be made in accordance with rules established by the Administrative Committee, shall apply prospectively only and shall be implemented as soon as practicable after the direction is received by the Administrative Committee.

The Administrative Committee may eliminate any Investment Fund at any time; provided, however, that the Administrative Committee may not retroactively eliminate any Investment Fund.

5.3 No Actual Investment. Notwithstanding any other provision of the Plan that may be interpreted to the contrary, the Investment Funds are to be used for measurement purposes only and Participants' election of any such Investment Fund, the allocation of amounts to Participants' Accounts, the calculation of any additional amounts and the crediting or debiting of amounts to Participants' Accounts shall not be considered or construed in any manner as an actual investment of Participants' Accounts in any investment alternative. In the event that the Company or any other Employer, in its own discretion, decides to invest funds in any or all of the investment funds that correspond to the Investment Funds under the Plan, no Participant shall have any rights in or to such actual investments themselves. Without limiting the generality of the foregoing, a Participant's Account balance shall at all times be a bookkeeping entry only and shall not represent any investment made on his behalf by the Employers and the Participant shall at all times remain an unsecured creditor of the Employers.

5.4 Statement of Plan Account. The Administrative Committee will cause to be delivered to each Plan Participant a statement of the balances of his Account as required by law.

SECTION 6

PAYMENT OF PLAN BENEFITS

6.1 Certain Definitions. For purposes of the Plan:

(a) A Participant's "Termination Date" shall mean the date on which his employment with the Employers and Related Companies terminates for any reason. Whether a Participant has had a termination of employment shall be interpreted and administered in all respects in accordance with section 409A of the Code and applicable regulations issued thereunder.

(b) A Participant's Years of Service shall be equal to the number of Vesting Service Years credited to him under the 401(k) Plan for purposes of vesting (and prior to the Effective Date, the Years of Service as determined under the Tenneco 401(k) Retirement Savings Plan); provided, however, that if a Participant is not a participant in the 401(k) Plan, his Years of Service shall be determined in accordance with the foregoing, as if he were a participant in the 401(k) Plan.

6.2 Vesting. A Participant shall become vested in his Employer Deferred Contributions, and income, loses, appreciation and depreciation attributable thereto, when he completes three Years of Service. If a Participant's Termination Date occurs prior to the date on which he completes three Years of Service, he shall forfeit the balance in his Account and he shall have no further rights to any portion of such balance.

6.3 Time and Form of Payment. The vested balance of a Participant's Account shall be distributed in a lump sum cash payment within 30 days following his Termination Date. Notwithstanding the foregoing or any other provision of the Plan to the contrary, if the Participant is a specified employee (within the meaning of section 409A of the Code) on his Termination Date, the amount credited to his Account under the Plan shall be paid in a lump sum cash payment on the first business day of the seventh month following his Termination Date (or if earlier, the date of his death).

6.4 Withholding for Tax Liability. Any Employer may withhold or cause to be withheld from any Employer Deferred Contributions or any other amounts otherwise due to the Participant or any payment of benefits made pursuant to the Plan any taxes required to be withheld and such sum as the Employer may reasonably estimate to be necessary to cover any taxes for which the Employer may be liable and that may be assessed with regard to such deferrals or payments under the Plan.

6.5 Beneficiary Designation. A Participant may, from time to time, designate in writing any legal or natural person or persons (who may be designated contingently or successively) to whom payments are to be made if the Participant dies before receiving payment of his entire Account balance. A beneficiary designation form will be effective only after it is filed in writing with the Administrative Committee while the Participant is alive and will cancel all beneficiary designation forms filed earlier.

6.6 Payment to Persons Under Legal Disability. In the event that any amount will be payable under this Plan to a Participant under legal or other disability who, in the opinion of the Administrative Committee, is unable to administer such payments, the payments will be made to the legal conservator of the estate of such Participant or, if no such legal conservator will have been appointed, then to any individual (for the benefit of such Participant) whom the Administrative Committee may from time to time approve.

6.7 Benefits May Not Be Assigned or Alienated. Benefits payable to Participants or beneficiaries under this Plan may not be anticipated, assigned (either at law or in equity), alienated, pledged, encumbered or subject to attachment, garnishment, levy, execution or other legal or equitable process.

6.8 Special Section 409A Provisions. It is intended that the Plan comply with the provisions of section 409A of the Code and all provisions of the Plan shall be construed and interpreted in accordance with the requirements of section 409A of the Code and applicable guidance thereunder. Notwithstanding any other provision of this Plan to the contrary, if any payment or benefit hereunder is subject to section 409A of the Code, and if such payment or benefit is to be paid or provided on account of the Participant's termination of employment (or other separation from service), the determination as to whether the Participant has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

SECTION 7

AMENDMENT AND TERMINATION

The Company reserves the right to amend or terminate the Plan by action of the Compensation Committee, or the committee or person to which it delegates such authority, and each Employer reserves the right to terminate the Plan, as applied to it; provided, however, that no such amendment or termination of the Plan will reduce the amount credited to any Participant as of the date of such amendment or termination. Any termination of the Plan will comply with Section 409A of the Code, and applicable regulations.

IN WITNESS WHEREOF, the undersigned, on behalf of the Company, hereby certifies that the foregoing is a true and correct copy of the Plan as in effect on the date hereof.

TENNECO INC.

BY: /s/ Jeffrey S. Bowen

ITS: Authorized Executive under the Assignment and Assumption Agreement

SCHEDULE 1

EMPLOYERS

Tenneco Automotive Operating Company Inc.

Federal-Mogul Piston Rings LLC

Federal-Mogul Ignition LLC

Federal-Mogul Powertrain LLC

Federal-Mogul Risk Advisory Services LLC

Federal-Mogul Sevierville LLC

Federal-Mogul Valve Train International LLC

Tenneco Automotive Walker Inc.

SUPPLEMENT A

BONUS BANK AMOUNTS

This Supplement A to the Tenneco Inc. Excess Benefit Plan (the "Plan") shall apply to any Participant in the Plan who had a balance in his or her Bonus Reserve Account under the Tenneco Inc. Value Added ("TAVA") Incentive Compensation Plan as of December 31, 2018. Unless otherwise specified, capitalized terms used in this Supplement shall have the meaning specified in the Plan.

The balance in the Participant's Bonus Reserve Account shall be paid to the Participant in a lump sum as of March 15, 2024 or, if earlier, upon the Participant's Termination Date. Notwithstanding any other provision of the Plan to the contrary, if any payment under this Supplement A is subject to section 409A of the Code, the provisions of subsection 6.8 of the Plan shall apply to the extent applicable.

EXHIBIT 10.36

DRiV INCORPORATED
EXCESS BENEFIT PLAN

(Effective as of January 1, 2020)

SECTION 1

GENERAL

1.1 History, Purpose and Effective Date. DRiV Incorporated (the "Company") has established the DRiV Incorporated Excess Benefit Plan (the "Plan"), effective as of January 1, 2020 (the "Effective Date"), to provide benefits to eligible employees of the Company and the Employers (as defined in subsection 1.2) whose benefits under the DRiV 401(k) Retirement Savings Plan (the "401(k) Plan") are limited as the result of certain limitations of the Internal Revenue Code of 1986, as amended (the "Code"), and as a result of the compensation that was taken into account under the 401(k) Plan for contribution purposes. Effective as of the Effective Date, certain liabilities under the Tenneco Inc. Excess Benefit Plan (the "Tenneco Plan") were transferred to the Plan as described in Section 4 hereof. The Plan is intended to constitute an unfunded plan maintained primarily for the purpose of providing deferred compensation for a select group of management or highly compensated employees. The Plan is intended to comply with section 409A of the Internal Revenue Code of 1986, as amended (the "Code") and will be interpreted and administered in accordance therewith.

1.2 Employers and Related Companies. The Company and any Related Company which, with the consent of the Company, adopts the Plan are referred to below collectively as the "Employers" and individually as an "Employer". The term "Related Company" means any corporation or trade or business during any period that it is, along with the Company, a member of a controlled group of trades or businesses within the meaning of sections 414(b) and (c) of the Code. As of the Effective Date, the Employers are set forth on Schedule 1 hereof.

1.3 Plan Administration. The authority to control and manage the operation and administration of the Plan will be vested in the committee or committees established by the Company with the authority to take administrative actions under and with respect to the Plan (the "Administrative Committee"). In controlling and managing the operation and administration of the Plan, the Administrative Committee will have full and discretionary power and authority to conclusively interpret and construe the provisions of the Plan, to determine the amount of benefits and the rights or eligibility of employees or Participants under the Plan and to establish a claims procedure, and will have such other powers and authorities as may be necessary to discharge its duties hereunder. Any interpretation of the Plan and any decision made by the Administrative Committee on any matter within the discretion of the Administrative Committee shall be binding on all persons. A misstatement or other mistake of fact shall be corrected when it becomes known, and the Administrative Committee shall make such adjustment on account thereof as it considers equitable and practicable. The Administrative Committee may delegate such of its ministerial or discretionary duties and functions as it may deem appropriate to any employee or group of employees of any Employer. Notwithstanding the foregoing, no member of the Administrative Committee may decide any matter relating to his or her own benefits under the Plan.

1.4 Source of Benefit Payments. Benefits payable under the Plan by any Employer will be paid from the general revenues and assets of such Employer and no Employer will be required to set up a funded reserve or otherwise set aside specific funds for the payment of its obligations under the Plan. None of the individuals entitled to benefits under the Plan will have any claim on, or any beneficial ownership interest in, any assets of any Employer, and any rights of such individuals under the Plan will constitute unsecured contractual rights only.

1.5 Applicable Laws. The Plan will be construed and administered in accordance with the internal laws of the State of Illinois to the extent that such laws are not preempted by the laws of the United States of America.

1.6 Gender and Number. Where the context admits, words in any gender will include any other gender, words in the singular will include the plural and the plural will include the singular.

1.7 Plan Year. The Plan Year shall be the calendar year.

1.8 Supplements. The provisions of the Plan as applied to any Employer, to any group of employees of any Employer may, with the consent of the Company, be modified or supplemented from time to time by the adoption of one or more Supplements. Each Supplement shall form a part of the Plan as of the Supplement's effective date. In the event of any inconsistency between a Supplement and the Plan document, the terms of the Supplement shall govern.

SECTION 2

PARTICIPATION

1.9 Eligibility for Participation. The Compensation Committee of the Board of Directors of the Company (the "Compensation Committee") shall determine those employees of the Employers who will be eligible to participate in the Plan for a Plan Year; provided, however, that, unless otherwise provided by the Compensation Committee, an employee of an Employer with a designation of EICP 1 or higher (other than any such employee who is specifically excluded from participation by the Compensation Committee) shall be eligible to participate in the Plan (each an "Eligible Employee"). Once an individual has been designated as an Eligible Employee, he shall remain as an Eligible Employee as long as he continues to be employed by the Employers or, if earlier, the first day of the first Plan Year following the date as of which he is no longer designated EICP 1 or higher.

1.10 Effective Date of Participation; Reemployment. Each person who is an Eligible Employee as of the first day of a Plan Year shall become a "Participant" in the Plan as of the first day of the Plan Year. If a person becomes an Eligible Employee after the first day of a Plan Year, he shall become a "Participant" in the Plan as of the first day on which he is an Eligible Employee. Once an individual becomes a Participant in the Plan for a Plan Year, he shall remain a Participant for the entire Plan Year (or portion thereof); provided, however, that an individual's participation in the Plan for a Plan Year shall end as of his Termination Date (as defined in subsection 5.1(a)) except as provided in Section 3. Notwithstanding the foregoing, if a Participant's Termination Date occurs during a Plan Year and he is employed or reemployed by an Employer or Related Company prior to the last day of the Plan Year, he shall immediately become a Participant upon his reemployment. Transferred Participants (as defined in Section 4) shall become Participants in the Plan as of the Effective Date with respect to their Transferred Benefits (as defined in Section 4). For the avoidance of doubt, a Transferred Participant shall be a Participant in the Plan other than with respect to his or her Transferred Benefits only if he or she otherwise satisfies the requirements for participation in the Plan.

1.11 Restricted Participation. During any period that a Participant continues in the employ of an Employer or a Related Company but is not an Eligible Employee and during any period for which no Employer Deferred Contributions (as defined in subsection 3.2) are made with respect to the Participant, the Participant, or in the event of his death, his beneficiary, will be considered and treated as a Participant for all purposes of the Plan except for purposes of Section 3.

1.12 Plan Not Contract of Employment. The Plan does not constitute a contract of employment or continued service, and nothing in the Plan will give any Participant the right to be retained in the employ of any Employer, nor any right or claim to any benefit under the Plan, except to the extent specifically provided under the terms of the Plan.

SECTION 3

ACCOUNTS AND CONTRIBUTIONS

2.1 Participant Accounts. The Administrative Committee shall maintain a bookkeeping "Account" in the name of each Participant to reflect such Participant's interest under the Plan.

2.2 Contributions.

(a) Participant Contributions. Participants are not required or permitted to make any contributions under the Plan.

(b) Employer Bonus Contributions. Each Employer shall make contributions to the Plan for each Plan Year ("Employer Bonus Contributions") on behalf of each of its employees who is a Participant for such Plan Year who was paid a bonus (or who would have been paid a bonus but for a deferral election related to such bonus) under the Company's annual performance bonus (the "Bonus") from an Employer for such Plan Year. The amount of the Employer Bonus Contribution made by an Employer for any Plan Year on behalf of any Participant shall be equal to (i) the Company Retirement Contribution percentage that applies to such Participant for such Plan Year under the 401(k) Plan (determined as of the first day of the Plan Year (or the date on which the Participant was first eligible to participate in the 401(k) Plan for such Plan Year, if later), without regard to any changes in such percentage during the Plan Year), multiplied by (ii) the Bonus. Employer Bonus Contributions shall be credited to the applicable Participants' Accounts in accordance with subsection 5.1.

(c) Employer Retirement Contributions. Each Employer shall make contributions to the Plan for each Plan Year ("Employer Retirement Contributions") on behalf of each of its employees who is a Participant in the Plan for such Plan Year and whose Company Retirement Contributions under the 401(k) Plan for such Plan Year are limited for such Plan Year by the limitations of section 401(a)(17) of the Code. The amount of Employer Retirement Contributions made by any Employer for any Plan Year on behalf of any Participant shall be equal to (i) the Company Retirement Contribution percentage that applies to such Participant for such Plan Year under the 401(k) Plan (determined as of the first day of the Plan Year (or the date on which the Participant was first eligible to participate in the 401(k) Plan for such Plan Year, if later) without regard to any changes in such percentage during the Plan Year), multiplied by (ii) the Participant's Compensation (as defined in the 401(k) Plan, but without regard to the limitations of section 401(a)(17) of the Code) for such Plan Year in excess of the limitations of section 401(a)(17) of the Code for such Plan Year. Employer Retirement Contributions shall be credited to the applicable Participants' Accounts in accordance with subsection 5.1.

(d) Employer Matching Contributions. Each Employer shall make contributions to the Plan for each Plan Year ("Employer Matching Contributions") on behalf of each of its employees who is a Participant in the Plan for such Plan Year, who has made the maximum permitted salary deferrals to the 401(k) Plan for such Plan Year, who is employed by the Employer on the last day of the Plan Year and whose Matching Company Contributions under the 401(k) Plan for such Plan Year are limited for such Plan Year by the limitations of section 401(a)(17) of the Code. The amount of Employer Matching Contribution made by any Employer for any Plan Year on behalf of any Participant shall be equal to the difference (but not less than zero) between (i) the maximum Matching Company Contributions that could have been made on behalf of the Participant under the 401(k) Plan for that year had the limitations of section 401(a)(17) of the Code had not applied minus (ii) the maximum Matching Company Contributions that could have been made on behalf of the Participant under the 401(k) Plan for that year taking into account the limitations of section 401(a)(17) of the Code. Employer Matching Contributions shall be credited to the applicable Participants' Accounts in accordance with subsection 5.1.

Employer Bonus Contributions, Employer Retirement Contributions and Employer Matching Contributions are sometimes collectively referred to herein as "Employer Deferred Contributions".

SECTION 4

TRANSFERRED PARTICIPANTS AND TRANSFERRED BENEFITS

Effective as of the Effective Date, the account balances of all individuals (the "Transferred Participants") who, immediately prior the Effective Date, (a) had accrued benefits under the Tenneco Plan and (b) were in any of the Transferred Categories (defined below) shall be transferred to the Plan. The amount of the benefits transferred from the Tenneco Plan to the Plan are referred to herein as "Transferred Benefits". The amount of the Transferred Benefits shall be determined after all adjustments required under the Tenneco Plan as of (or prior to) December 31, 2019 are completed. For purposes of the Plan, the "Transferred Categories" shall mean:

(e) employees who are employed by the Company or any Related Company immediately prior to the Effective Date ("Active Employees") in connection with the Company's Motorparts business;

(f) Active Employees who are employed in connection with the Company's Ride Performance business and all participants in the Tenneco Plan who are not active employees immediately prior to the Effective Date ("Former Employees") and who are designated by ("Tenneco") and the Company as former Ride Performance employees; and

(g) Active Employees who are designated by Tenneco and the Company as DRiV Corporate Staff and DRiV Global Services employees; and

(h) Former Employees who are designated by Tenneco and the Company as former Clean Air employees.

SECTION 5

PLAN ACCOUNTING

2.3 Adjustment of Accounts. Each Participant's Account shall be adjusted in accordance with this Section 5, in a uniform, nondiscriminatory manner, as of each business day on which the New York Stock Exchange is open for business (each an "Accounting Date"). As of each Accounting Date, the balance of each Participant's Account shall be adjusted as follows:

(a) first, charge to the Account balance the amount of any distributions under the Plan with respect to that Account that have not previously been charged;

(b) next, credit to the Account balance the amount of Employer Deferred Contributions made on behalf of the Participant in accordance with Section 3 since the preceding Accounting Date; and

(c) finally, adjust the Account balance for the applicable investment return in accordance with subsection 5.2.

Amounts attributable to Transferred Benefits of a Transferred Participant shall be credited to the Account of the Transferred Participant as of the Effective Date.

2.4 Investment Return. The following shall apply with respect to amounts credited to a Participant's Account:

(a) Amounts credited to a Participant's Account in accordance with subsection 5.1 shall be adjusted as of each Accounting Date to reflect the value of an investment equal to the Participant's Account balance in one or more assumed investments that the Administrative Committee offers from time to time and communicated to Participants (the "Investment Funds"), and which the Participant directs the Administrative Committee to use for purposes of adjusting his Account. Such amount shall be determined without regard to taxes that would be payable with respect to any such Investment Fund, but will be adjusted for any investment management or similar fee that is customarily paid with respect to the Investment Fund.

(b) To the extent permitted by the Administrative Committee, the Participant may elect to have different portions of his Account balance for any period adjusted on the basis of different Investment Funds and any election by a Participant with respect to an Investment Fund shall be subject to such rules and regulations established from time to time by the Administrative Committee.

(c) Notwithstanding the election by Participants of certain investments in specified Investment Funds and the adjustment of their Accounts based on such investment elections, the Plan does not require, and no trust or other instrument that may be maintained in connection with the Plan shall require, that any assets or amounts that are set aside in trust or otherwise for the purpose of paying Plan benefits shall actually be invested in the investment alternatives selected by Participants.

(d) Any change in the Participant's investment direction shall be made in accordance with rules established by the Administrative Committee, shall apply prospectively only and shall be implemented as soon as practicable after the direction is received by the Administrative Committee.

(e) As of the Effective Date, any amounts attributable to Transferred Benefits shall be invested in same the Investment Funds as such amounts were invested under the Tenneco Plan immediately prior to the Effective Date.

The Administrative Committee may eliminate any Investment Fund at any time; provided, however, that the Administrative Committee may not retroactively eliminate any Investment Fund.

2.5 No Actual Investment. Notwithstanding any other provision of the Plan that may be interpreted to the contrary, the Investment Funds are to be used for measurement purposes only and Participants' election of any such Investment Fund, the allocation of amounts to Participants' Accounts, the calculation of any additional amounts and the crediting or debiting of amounts to Participants' Accounts shall not be considered or construed in any manner as an actual investment of Participants' Accounts in any investment alternative. In the event that the Company or any other Employer, in its own discretion, decides to invest funds in any or all of the investment funds that correspond to the Investment Funds under the Plan, no Participant shall have any rights in or to such actual investments themselves.

Without limiting the generality of the foregoing, a Participant's Account balance shall at all times be a bookkeeping entry only and shall not represent any investment made on his behalf by the Employers and the Participant shall at all times remain an unsecured creditor of the Employers.

2.6 Statement of Plan Account. The Administrative Committee will cause to be delivered to each Plan Participant a statement of the balances of his Account as required by law.

SECTION 6

PAYMENT OF PLAN BENEFITS

2.7 Certain Definitions. For purposes of the Plan:

(a) A Participant's "Termination Date" shall mean the date on which his employment with the Employers and Related Companies terminates for any reason. Whether a Participant has had a termination of employment shall be interpreted and administered in all respects in accordance with section 409A of the Code and applicable regulations issued thereunder.

(b) A Participant's Years of Service shall be equal to the number of Years of Service credited to him under the 401(k) Plan for purposes of vesting; provided, however, that if a Participant is not a participant in the 401(k) Plan, his Years of Service shall be determined in accordance with the foregoing, as if he were a participant in the 401(k) Plan.

2.8 Vesting. A Participant shall become vested in his Employer Deferred Contributions, and income, loses, appreciation and depreciation attributable thereto, when he completes three Years of Service. If a Participant's Termination Date occurs prior to the date on which he completes three Years of Service, he shall forfeit the balance in his Account and he shall have no further rights to any portion of such balance. The amount of the Transferred Balances transferred to the Plan shall be vested to the same extent as of the Effective Date as such Transferred Balances were vested under the Tenneco Plan immediately prior to the Effective Date.

2.9 Time and Form of Payment. The vested balance of a Participant's Account shall be distributed in a lump sum cash payment within 30 days following his Termination Date. Notwithstanding the foregoing or any other provision of the Plan to the contrary, if the Participant is a specified employee (within the meaning of section 409A of the Code) on his Termination Date, the amount credited to his Account under the Plan shall be paid in a lump sum cash payment on the first business day of the seventh month following his Termination Date. Without limiting the generality of the foregoing, any Transferred Balances shall be paid at the same time and in the same form as applied to such Transferred Balances immediately prior to the Effective Date.

2.10 Withholding for Tax Liability. Any Employer may withhold or cause to be withheld from any Employer Deferred Contributions or any other amounts otherwise due to the Participant or any payment of benefits made pursuant to the Plan any taxes required to be withheld and such sum as the Employer may reasonably estimate to be necessary to cover any taxes for which the Employer may be liable and that may be assessed with regard to such deferrals or payments under the Plan.

2.11 Beneficiary Designation. A Participant may, from time to time, designate in writing any legal or natural person or persons (who may be designated contingently or successively) to whom payments are to be made if the Participant dies before receiving payment of his entire Account balance. A beneficiary designation form will be effective only after it is filed in writing with the Administrative Committee while the Participant is alive and will cancel all beneficiary designation forms filed earlier. Unless otherwise provided by the Administrative Committee, the beneficiary designation in effect with respect to Transferred Benefits shall apply with respect to a Participant's Account under the Plan unless it is changed on or after the Effective Date in accordance with the terms of the Plan.

2.12 Payment to Persons Under Legal Disability. In the event that any amount will be payable under this Plan to a Participant under legal or other disability who, in the opinion of the Administrative Committee, is unable to administer such payments, the payments will be made to the legal conservator of the estate of such Participant or, if no such legal conservator will have been appointed, then to any individual (for the benefit of such Participant) whom the Administrative Committee may from time to time approve.

2.13 Benefits May Not Be Assigned or Alienated. Benefits payable to Participants or beneficiaries under this Plan may not be anticipated, assigned (either at law or in equity), alienated, pledged, encumbered or subject to attachment, garnishment, levy, execution or other legal or equitable process.

2.14 Special Section 409A Provisions. It is intended that the Plan comply with the provisions of section 409A of the Code and all provisions of the Plan shall be construed and interpreted in accordance with the requirements of section 409A of the Code and applicable guidance thereunder. Notwithstanding any other provision of this Plan to the contrary, if any payment or benefit hereunder is subject to section 409A of the Code, and if such payment or benefit is to be paid or provided on account of the Participant's termination of employment (or other separation from service):

(a) and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment or benefit is required to be made or provided prior to the first day of the seventh month following the Participant's separation from service or termination of employment, such payment or benefit shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service (or, if earlier, on death); and

(b) the determination as to whether the Participant has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

SECTION 7

AMENDMENT AND TERMINATION

The Company reserves the right to amend or terminate the Plan by action of the Compensation Committee, or the committee or person to which it delegates such authority, and each Employer reserves the right to terminate the Plan, as applied to it; provided, however, that no such amendment or termination of the Plan will reduce the amount credited to any Participant as of the date of such amendment or termination.

Pursuant to the authority granted to the undersigned by the Company, effective as of January 1, 2020, the undersigned officer, on behalf of and in the name of the Company, hereby adopts the DRiV Incorporated Excess Benefit Plan.

Date: December 20, 2019 DRiV Incorporated

By /s/ Kaled Awada

Its Kaled Awada

SUPPLEMENT A

BONUS BANK AMOUNTS

This Supplement A to the DRiV Incorporated Excess Benefit Plan (the "Plan") shall apply to any Transferred Participant in the Plan who had a balance in his or her Bonus Reserve Account under the Tenneco Inc. Value Added ("TAVA") Incentive Compensation Plan as of December 31, 2018. Unless otherwise specified, capitalized terms used in this Supplement shall have the meaning specified in the Plan.

The balance in the Transferred Participant's Bonus Reserve Account shall be paid to the Participant in a lump sum as of March 15, 2024 or, if earlier, upon the Participant's termination of employment. Notwithstanding any other provision of the Plan to the contrary, if any payment under this Supplement A is subject to section 409A of the Code, the provisions of subsection 6.8 of the Plan shall apply to the extent applicable.

EXHIBIT 10.52

TENNECO INC.
CASH-SETTLED
LONG-TERM PERFORMANCE UNIT AWARD AGREEMENT
(2020-2022 Performance Period)

____
Participant

Effective as of **[Grant Date]** (the "Grant Date"), the Participant has been granted a Cash Incentive Award (the "Award") under the Tenneco Inc. 2006 Long-Term Incentive Plan (the "Plan"). The Award is subject to the following terms and conditions (sometimes referred to as this "Award Agreement") and the terms and conditions of the Plan as the same has been and may be amended from time to time. Terms used in this Award Agreement are defined elsewhere in this Award Agreement; provided, however, that, capitalized terms used herein and not otherwise defined shall have the meaning set forth in the Plan.

1. General Terms of the Award. The following terms and conditions apply to the Award:
Performance Period: January 1, 2020 to December 31, 2022

Target Award (Dollar Value): $____________________

Performance Targets: 50% based on Cumulative Division Cash
50% based on Cumulative Division EBITDA

Appendix A of this Award Agreement, which is incorporated herein and forms a part of this Award Agreement, sets forth the manner in which "Cumulative Division Cash" and "Cumulative Division EBITDA" are calculated and applied for purposes of this Award Agreement. Cumulative Division Cash and Cumulative Division EBITDA are sometimes referred to herein individually as a "Performance Target" and collectively as the "Performance Targets".

2. Determination of Amount of Award. The amount of the Target Award that becomes vested pursuant to this Award (the "Vested Award") shall be based on satisfaction of the Performance Targets and continuing employment as described in this Award Agreement. The maximum amount of the Target Award that shall become vested pursuant to this Award based on the satisfaction of the Performance Targets shall be determined in accordance with the following:

(a) *Cumulative Division Cash Target Award-Non Enterprise Participant.* For purposes hereof, the Participant's "Cumulative Division Cash Target Award" is equal to 50% of his or her total Target Award. The maximum value of the Cumulative Division Cash Target Award (expressed as a percentage, the "Cumulative Division Cash Vesting Percentage") that may become vested hereunder (subject to the terms and conditions of the Plan and this Award Agreement) is based on Cumulative Division Cash (calculated as described in Appendix A) achieved for the Performance Period against the Cumulative Division Cash Performance Target established by the Committee for the Performance Period, based on the following chart:

Cumulative Division Cash Performance Target	Cumulative Division Cash Vesting Percentage
*	200% (maximum)
*	100% (target)
*	50% (threshold)
*	0%

*As established by the Committee (as adjusted in accordance with the Plan and this Award Agreement), based on the Participant's division allocation as of the Grant Date.

(b) *Cumulative Division EBITDA Target Award-Non-Enterprise Participant.* For purposes hereof, the Participant's "Cumulative Division EBITDA Target Award" is equal to 50% of his or her total

Target Award. The maximum value of the Cumulative Division EBITDA Target Award (expressed as a percentage, the "Cumulative Division EBITDA Vesting Percentage") that may become vested hereunder (subject to the terms and conditions of the Plan and this Award Agreement) is based on Cumulative Division EBITDA (calculated as described in Appendix A) achieved for the Performance Period against the Cumulative Division EBITDA Performance Target established by the Committee for the Performance Period, based on the following chart:

Cumulative Division EBITDA Performance Target	**Cumulative Division EBITDA Vesting Percentage**
*	200% (maximum)
*	100% (target)
*	50% (threshold)
*	0%

*As established by the Committee (as adjusted in accordance with the Plan and this Award Agreement), based on the Participant's division allocation as of the Grant Date.

(c) *Special Rules for Enterprise Participants.* Notwithstanding the foregoing, for purposes hereof:

(i) In the case of an Enterprise Participant (as defined Paragraph 3(f)), the Enterprise Participant's "Cumulative Division Cash Target Award" is equal to 50% of his or her total Target Award and the maximum value of the Cumulative Division Cash Target Award (expressed as a percentage, the "Cumulative Division Cash Vesting Percentage") that may become vested hereunder (subject to the terms and conditions of the Plan and this Award Agreement) is based 25% on the Performance Targets achieved for the Performance Period against the Cumulative Division Cash Performance Target established by the Committee for the Performance Period based on the chart applicable under Paragraph 2(a) and 25% on the following chart:

Cumulative Division Cash Performance Target	**Cumulative Division Cash Vesting Percentage**
*	200% (maximum)
*	100% (target)
*	50% (threshold)
*	0%

*As established by the Committee (as adjusted in accordance with the Plan and this Award Agreement), based on the division not covered by Paragraph 2(a).

(ii) an Enterprise Participant's "Cumulative Division EBITDA Target Award" is equal to 50% of his or her total Target Award and the maximum value of the Cumulative Division EBITDA Target Award (expressed as a percentage, the "Cumulative Division EBITDA Vesting Percentage") that may become vested hereunder (subject to the terms and conditions of the Plan and this Award Agreement) is based 25% on the Cumulative Division EBITDA achieved for the Performance Period against the Cumulative Division EBITDA Performance Target established by the Committee for the Performance Period based on the chart applicable under Paragraph 2(b) and 25% on the following chart:

Cumulative Division EBITDA Performance Target	**Cumulative Division EBITDA Vesting Percentage**
*	200% (maximum)
*	100% (target)
*	50% (threshold)
*	0%

*As established by the Committee (as adjusted in accordance with the Plan and this Award Agreement), based on the division not covered by Paragraph 2(b).

(d) *Interpolation.* Linear interpolation shall be used to determine the Cumulative Division Cash Vesting Percentage and Cumulative Division EBITDA Vesting Percentage, as applicable, under Paragraphs 2(a), (b) and (c) in the event Cumulative Division Cash or Cumulative Division EBITDA, as applicable, does not fall directly on one of the targets, as applicable, listed in the above charts.

(e) *Determination of Performance and Amount of Vested Award.* As soon as practicable after the end of the Performance Period, the Committee shall determine whether and the extent to which the Performance Targets have been satisfied for the Performance Period and the value of the Participant's Target Award that becomes the Vested Award based on such performance, subject to the terms and conditions of Paragraph 3 and the other terms and conditions of this Award Agreement.

(f) *Adjustment of* Performance *Targets in Certain Circumstances.* Without limiting the generality of the Committee's authority to adjust any aspect of this Award in accordance with the terms hereof or the provisions of the Plan, in the event that the determination as to whether and the extent to which the Performance Targets are met occurs other than as of the last date of the Performance Period in accordance with Paragraph 3(e), the Performance Targets shall be pro-rated for the portion of the Performance Period elapsed as of the date the determination is to be made as described in Appendix A. In the event of a Business Transaction (defined below), the Performance Targets shall be adjusted to remove the future portion of the applicable Performance Target that is attributable to the business divested in connection with the Business Transaction. For purposes of the Award Agreement, a "Business Transaction" means a corporate transaction, other than a New Tenneco Transaction or a DRiV Transaction (each as defined in Paragraph 3), and any other transaction involving the Company that constitutes a spin-off, sale of assets, sale of a subsidiary, combination, split-up, or other similar material transaction as determined by the Committee.

3. Payment and Settlement of Award.

(a) *Unvested Award.* Except as otherwise specifically provided herein, the Participant shall have no right with respect to any payments or other amounts in respect of this Award until the Award is actually paid and settled on the Settlement Date (as defined below) and if the Participant's Termination Date occurs before the Settlement Date, this Award shall immediately expire and shall be forfeited and the Participant shall have no further rights with respect thereto. In addition, this Award is subject to forfeiture if the Participant fails to accept the Award within the first twelve (12) months following the Grant Date in accordance with procedures established by the Company.

(b) *Payment and Settlement Generally.* Except as otherwise provided in this Paragraph 3, payment and settlement of the Vested Award shall be made following the end of the Performance Period as of a date determined by the Committee and no later than two and one-half months after the end of the Performance Period (such date, the "Settlement Date"). Payment and settlement of the Vested Award shall be made in the form of cash. Upon the payment and settlement of the Award, the Award shall be cancelled.

(c) *Termination for Death, Total Disability or Retirement.* Notwithstanding the provisions of Paragraphs 3(a) and (b), if the Participant's Termination Date occurs on or before the applicable Settlement Date (as determined under Paragraph 3(b)):

(i) as a result of the Participant's death or Total Disability (as defined below), the value of the Target Award that shall become the Vested Award shall equal the product of (A) 100% of the value of the Target Award subject to this Award, multiplied by (B) the Termination Multiplier (as defined below), which Vested Award shall be paid and settled within sixty

(60) days after the Participant's Termination Date (and such date shall be the "Settlement Date" for purposes of this Award Agreement); or

(ii) as a result of Retirement (as defined below) the value of the Target Award that shall become the Vested Award shall equal to the product of (A) the value of the Target Award subject to this Award that would have become a Vested Award pursuant to Paragraph 2 based on performance for the Performance Period had the Participant's Termination Date not occurred prior to the end of the Performance Period, multiplied by (B) the Termination Multiplier, which Vested Award shall be paid and settled on the Settlement Date (as determined under Paragraph 3(b)).

For purposes of this Paragraph 3(c), if the Participant's Termination Date occurs after the end of the Performance Period and prior to the Settlement Date (as determined under Paragraph 3(b)) as a result of the Participant's death, Total Disability or Retirement, the Participant (or, in the event of his or her death, his or her beneficiary) shall be entitled to payment and settlement on the Settlement Date (as determined under Paragraph 3(b)) of that portion of the Target Award that would have become a Vested Award pursuant to Paragraph 2 based on performance for the Performance Period had his or her Termination Date not occurred prior to the applicable Settlement Date.

(d) *Special Vesting Rules for Special Projects.* In the event that the Participant is assigned to a special project with a limited scope (as approved by the Committee or in accordance with guidelines established by the Committee) and if the Participant's Termination Date occurs prior to the Settlement Date (as determined under Paragraph 3(b)) as a result of termination by the Company or a Subsidiary for reasons other than for Cause (as defined below), then the amount of the Target Award that shall become the Vested Award is 100% of the Target Award subject to this Award, which Vested Award shall be paid and settled within sixty (60) days after the Participant's Termination Date (and such date shall be the "Settlement Date" for purposes of this Award Agreement).

(e) *Change in Control and Other Business Transactions.* Except as expressly provided herein, the provisions of this Paragraph 3(e) shall supersede the provisions of Article 6 of the Plan. To the extent applicable, the following provisions shall apply to the Participant based on whether the Participant is a DRiV Participant or a New Tenneco Participant (each as defined below) as of the date of the applicable transaction.

(i) In the event of a Change in Control other than a New Tenneco Transaction or a DRiV Transaction (each as defined below), the provisions of Article 6 of the Plan shall apply.

(ii) The following shall apply if a New Tenneco Transaction occurs during the Performance Period:

(A) In the case of New Tenneco Participants, the Committee shall determine whether and the extent to which the Performance Targets have been satisfied (and the amount of the Vested Award based on performance) under the provisions of Paragraph 2 as if the date of the New Tenneco Transaction was the last day of the Performance Period; provided, however, that in the case of any New Tenneco Participant who is an Enterprise Participant, any portion of the Award that is to be calculated with respect to Performance Targets based on the performance of the DRiV Division shall be calculated as of the last day of the calendar year preceding the year in which the New Tenneco Transaction occurs in accordance with the provisions of Paragraph 2 based on the Performance Targets applicable to the DRiV Division as if the last day of such calendar year was the last day of the Performance Period. The portion of the Target Award that shall become the Vested

Award pursuant to this subclause (A) is the greater of the value of the Vested Award determined in accordance with Paragraph 2 (as modified by this subclause (A) and, in the case of Enterprise Participants, determined separately with respect to the portion determined based on New Tenneco performance and DRiV performance) or 100% of the Target Award subject to this Award and, in the case of Enterprise Participants, determined separately with respect to the portion determined based on New Tenneco performance and DRiV performance. Payment and settlement of the Vested Award shall be made to each New Tenneco Participant within sixty (60) days following the New Tenneco Transaction and, upon payment and settlement, the Award shall be cancelled.

(B) In the case of DRiV Participants, the Award shall continue in accordance with its terms (including payment and settlement); provided, however, that in the case of any DRiV Participant who is an Enterprise Participant, any portion of the Award that is to be calculated with respect to Performance Targets based on the performance of the New Tenneco Division shall be calculated as of the last day of the calendar year preceding the year in which the New Tenneco Transaction occurs in accordance with the provisions of Paragraph 2 based on the Performance Targets applicable to the New Tenneco Division as if the last day of such calendar year was the last day of the Performance Period and any remaining portion of the Performance Period shall be calculated based solely on the Performance Targets applicable to the DRiV Division.

(iii) The following shall apply if a DRiV Transaction (other than a DRiV Transaction that is a spin-off) occurs during the Performance Period:

(A) In the case of DRiV Participants, the Committee shall determine whether and the extent to which the Performance Targets have been satisfied (and the amount of the Vested Award based on performance) under the provisions of Paragraph 2 as if the date of the DRiV Transaction was the last day of the Performance Period provided, however, that in the case of any DRiV Participant who is an Enterprise Participant, any portion of the Award that is to be calculated with respect to Performance Targets based on the performance of the New Tenneco Division shall be calculated as of the last day of the calendar year preceding the year in which the DRiV Transaction occurs in accordance with the provisions of Paragraph 2 based on the Performance Targets applicable to the New Tenneco Division as if the last day of such calendar year was the last day of the Performance Period. The portion of the Target Award that shall become the Vested Award pursuant to this subclause (A) is the greater of the value of the Vested Award determined in accordance with Paragraph 2 (as modified by this subclause (A) and, in the case of Enterprise Participants, determined separately with respect to the portion determined based on DRiV performance and New Tenneco performance) or 100% of the Target Award subject to this Award and, in the case of Enterprise Participants, determined separately with respect to the portion determined based on DRiV performance and New Tenneco performance. Payment and settlement of the Vested Award shall be made to each DRiV Participant within sixty (60) days following the DRiV Transaction and, upon payment and settlement, the Award shall be cancelled.

(B) In the case of New Tenneco Participants, the Award shall continue in accordance with its terms (including payment and settlement); provided, however, that in the case of any New Tenneco Participant who is an Enterprise Participant, any portion of the Award that is to be calculated with respect to Performance Targets based on the performance of the DRiV Division shall be calculated as of the last day of the calendar year preceding the year in which the DRiV Transaction occurs in accordance with the provisions of Paragraph 2 based on the Performance Targets applicable to the DRiV Division as if the last day of such calendar year was the last day of the Performance Period and any remaining portion of the Performance Period shall be calculated based solely on the Performance Targets applicable to the New Tenneco Division.

(iv) The following shall apply if a DRiV Transaction that is a spin-off occurs during the Performance Period:

(A) In the case of New Tenneco Participants and DRiV Participants other than Enterprise Participants, the Award shall continue in accordance with its terms (including payment and settlement).

(B) In the case of Enterprise Participants, for the portion of the Performance Period ending with the last day of the calendar year preceding the date of the spin-off, any portion of the Award that is to be calculated with respect to Performance Targets based on the DRiV Division (in the case of a New Tenneco Participant) or the New Tenneco Division (in the case of a DRiV Participant) shall be calculated as of the last day of the calendar year preceding the year in which the spin-off occurs in accordance with Paragraph 2 as if the last day of such calendar year was the last day of the Performance Period and any remaining portion of the Performance Period shall be calculated based solely on the Performance Targets applicable to the DRiV Division (in the case of a DRiV Participant) or the New Tenneco Division (in the case of a New Tenneco Participant).

(f) *Certain Definitions.* For purposes of this Award Agreement, the following terms shall have the meaning specified:

(i) "Cause" means, with respect to the Participant, (A) fraud, embezzlement, or theft in connection with his or her employment (B) gross negligence in the performance of his or her duties, (C) his or her conviction, guilty plea, or plea of nolo contendere with respect to a felony, (D) the willful and continued failure to substantially perform his or her duties for the Company or any of its Subsidiaries (except where the failure results from incapacity due to disability), (E) the failure to meet the obligations required by his or her position, as determined in the reasonable discretion of the Committee, or (F) the willful or negligent engagement in conduct which is, or could reasonably be expected to be, materially injurious to any of the Company or any of its Subsidiaries, monetarily or otherwise. For purposes of the foregoing, no act, or failure to act, on the part of the Participant shall be deemed "willful" unless done, or omitted to be done, by the Participant not in good faith and without reasonable belief that his or her act, or failure to act, was in the best interest of the Company and its Subsidiaries.

(ii) "DRiV Division" means the Company's business consisting primarily of the Company's Global Motorparts business group and Global Ride Performance business group and applicable reporting lines thereunder as determined from time to time by the Company.

(iii) "DRiV Participant" means a Participant (including an Enterprise Participant) who is employed primarily in the Company's DRiV Division as of the Grant Date, subject to changes in such division allocation permitted under this Award Agreement.

(iv) "DRiV Transaction" means (A) a sale of the Company's DRiV Division; provided, however, that a sale of the DRiV Division shall not constitute a DRiV Transaction unless the sale constitutes a sale of all or substantially all of the DRiV Division or (B) a spin-off of the Company's DRiV Division. A DRiV Transaction shall not constitute a Change in

Control for purposes of this Award Agreement even if it otherwise constitutes a Change in Control for purposes of the Plan.

(v) "Enterprise Participant" means a DRiV Participant or a New Tenneco Participant who is designated by the Committee as an Enterprise Participant as of the Grant Date.

(vi) "New Tenneco Division" means the Company's business consisting primarily of the Company's Global Clean Air business group and Global Powertrain business group and applicable reporting lines thereunder as determined from time to time by the Company.

(vii) "New Tenneco Participant" means a Participant (including an Enterprise Participant) who is employed primarily in the Company's New Tenneco Division as of the Grant Date, subject to changes in such division allocation permitted under this Award Agreement.

(viii) "New Tenneco Transaction" means a sale of the Company's New Tenneco Division; provided, however, that a sale of the New Tenneco Division shall not constitute a New Tenneco Transaction unless the sale constitutes a sale of all or substantially all of the New Tenneco Division. A New Tenneco Transaction shall not constitute a Change in Control for purposes of this Award Agreement even if it otherwise constitutes a Change in Control for purposes of the of the Plan.

(ix) "Retirement" means the Participant's termination of employment with the Company and its Subsidiaries after the date on which the Participant attains (A) age 65 or (B) age 55 and has completed at least 10 years of service with the Company and its Subsidiaries and is not for any other reason, including voluntary resignation, termination by the Company or a Subsidiary for cause, which shall include the failure of the Participant to meet the obligations required by his or her position (as determined in the reasonable discretion of the company), or termination by the Participant for good reason or constructive discharge.

(x) "Termination Multiplier" means a fraction, the numerator of which is the number of full months of the Participant's employment during the Performance Period prior to his or her Termination Date and the denominator of which is thirty six (36).

(xi) "Total Disability" means an event that results in the Participant being (A) unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, or (B) by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, receiving income replacement benefits for a period of not less than three (3) months under an accident and health plan covering employees of the Company or its Subsidiaries.

(g) *Effect of Contrary Terms in Employment Agreement.* In the event that the Company (or any of its Subsidiaries) is a party to a written employment agreement with the Participant, and if the employment agreement is inconsistent with the provisions of this Paragraph 3, the terms of the employment agreement will take precedence over the foregoing provisions, as applicable.

(h) *Section 409A.* It is the intent that none of the payments provided pursuant to this Paragraph 3 or otherwise under this Award Agreement be subject to Section 409A of the Code. In the event that any of the payments are subject to Section 409A of the Code and the payment is to be made other than on the Settlement Date (as determined under Paragraph 3(b)), such payment shall be made at a time other than the Settlement Date determined under Paragraph 3(b) only if permitted under

Section 409A of the Code and otherwise shall be made as of the Settlement Date determined under Paragraph 3(b).

4. Payment in Certain Cases. If the Participant is entitled to receive payment for this Award pursuant to Article 6 of the Plan (relating to Change in Control), that payment shall be equal to the amount the Participant would have received hereunder as if (a) his or her service had continued through the end of the Performance Period and (b) he or she had earned the "target" level of the Target Award.

5. Withholding. All Awards and distributions under the Plan, including this Award and any distribution in respect of this Award, are subject to withholding of all applicable taxes, and the delivery of any cash or other benefits under the Plan or this Award is conditioned on satisfaction of the applicable tax withholding obligations. Such withholding obligations may be satisfied, at the Participant's election, (a) through cash payment by the Participant, or (b) through the surrender of cash to which the Participant is otherwise entitled under the Plan (including this Award); provided, however, that any withholding obligations with respect to any Participant shall be satisfied by the method set forth in subparagraph (b) of this Paragraph 5 (through the withholding of cash otherwise payable pursuant to this Award) unless the Participant otherwise elects in accordance with this Paragraph 5.

6. Transferability. This Award is not transferable except as designated by the Participant by will or by the laws of descent and distribution or pursuant to a qualified domestic relations order.

7. Heirs and Successors. If any benefits deliverable to the Participant under this Award Agreement have not been delivered at the time of the Participant's death, such benefits shall be delivered to the Participant's Designated Beneficiary, in accordance with the provisions of this Award Agreement. The "Designated Beneficiary" shall be the beneficiary or beneficiaries designated by the Participant in a writing filed with the Company in such form and at such time as the Company shall require and in accordance with such rules and procedures established by the Company. If a deceased Participant fails to designate a beneficiary, or if the Designated Beneficiary does not survive the Participant, any rights that would have been exercisable by the Participant and any benefits distributable to the Participant shall be distributed to the legal representative of the estate of the Participant.

8. Administration. The authority to administer and interpret this Award and this Award Agreement shall be vested in the Committee, and the Committee shall have all powers with respect to this Award and this Award Agreement as it has with respect to the Plan. Any interpretation of this Award or this Award Agreement by the Committee and any decision made by it with respect to the Award or the Award Agreement is final and binding on all persons. Notwithstanding the foregoing, an "Administrative Committee" consisting of the Chief Executive Officer of the Company, the Chief Financial Officer of the Company, and the Chief Human Resources Officer of the Company shall have all of the rights, powers, duties, authorities, and obligations of, the Committee under this Award Agreement with respect to allocating the Participant (or modifying the Participant's allocation) to the DRiV Division or the New Tenneco Division based on the services provided by the Participant or as determined appropriate in the case of a transaction described in Paragraph 3(e); provided, however, that the Administrative Committee may not take any action with respect to any Participant who is determined by the Company to be an officer of the Company for purposes of Section 16 of the Securities Exchange Act of 1934, as amended; and provided further that no change in division allocation shall apply with respect to any Enterprise Participant. The action of any individual Administrative Committee member consistent with the authority delegated to the Administrative Committee shall be considered to be action of the Committee.

9. Addendum to Award Agreement. Notwithstanding any provision of this Award Agreement, if the Participant resides and/or works outside the United States of America (the "United States", "U.S." or "U.S.A."), this Award shall be subject to the special terms and conditions set forth in the Addendum hereto for the Participant's country. Further, if the Participant transfers residence and/or employment to another country reflected in the Addendum, the special terms and conditions for such country will apply to the Participant to the extent the Company determines, in its sole discretion, that the application of such special terms and conditions is necessary or advisable for legal or administrative reasons (or the Company may establish alternative terms and conditions as

may be necessary or advisable to accommodate Participant's transfer). The Addendum shall constitute part of this Award Agreement.

10. Notices. Any notice required or permitted under this Award Agreement shall be deemed given when delivered personally, or when deposited in a United States Post Office, postage prepaid, addressed, as appropriate, to the Committee or the Company at the Company's principal offices, to the Participant at the Participant's address as last known by the Company or, in any case, such other address as one party may designate in writing to the other.

11. Governing Law. The validity, construction and effect of this Award Agreement shall be determined in accordance with the laws of the State of Illinois and applicable federal law.

12. Amendments. The Board may, at any time, amend or terminate the Plan, and the Committee may amend this Award Agreement, provided that, except as provided in the Plan, no amendment or termination may, in the absence of written consent to the change by the affected Participant (or, if the Participant is not then living, the affected beneficiary), adversely affect the rights of any Participant or beneficiary under this Award Agreement prior to the date such amendment or termination is adopted by the Board or the Committee, as the case may be. Without limiting the generality of the foregoing or of Paragraph 15, the Committee may amend or terminate this Award at any time prior to the Settlement Date in its sole discretion to exercise downward discretion in the amount payable under this Award if the Committee determines that the payout yielded or that would be yielded by this Award for the Performance Period does not accurately reflect the applicable performance for the Performance Period.

13. Award Not Contract of Employment. The Award does not constitute a contract of employment or continued service, and the grant of the Award shall not give the Participant the right to be retained in the employ or service of the Company or any Subsidiary, nor any right or claim to any benefit under the Plan or this Award Agreement, unless such right or claim has specifically accrued under the terms of the Plan and this Award Agreement.

14. Severability. If a provision of this Award Agreement is held invalid by a court of competent jurisdiction, the remaining provisions shall nonetheless be enforceable according to their terms. Further, if any provision is held to be overbroad as written, that provision shall be amended to narrow its application to the extent necessary to make the provision enforceable according to applicable law and enforced as amended.

15. Plan Governs/Other Terms. The Award evidenced by this Award Agreement is granted pursuant to the Plan, and this Award and this Award Agreement are in all respects governed by the Plan and subject to all of the terms and provisions thereof, whether such terms and provisions are incorporated in this Award Agreement by reference or are expressly cited. Notwithstanding any other provision of the Plan or this Award Agreement, (a) all Awards are subject to the Company's recoupment or clawback policies as applicable and as in effect from time to time, (b) if the Committee determines, in its sole discretion, that the Participant at any time has willfully engaged in any activity that the Committee determines was or is harmful to the Company or any of its Subsidiaries, any unpaid portion of the Award shall be forfeited and the Participant shall have no rights with respect thereto, (c) the Committee may, in its sole and absolute discretion, adjust any Performance Target or the calculation thereof, and (d nothing in this Agreement supersedes or limits the Committee's authority under the Plan.

16. Counterparts. This Award Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original and all of which together shall constitute one and the same instrument.

17. Special Section 409A Rules. It is intended that any amounts payable under this Award Agreement shall either be exempt from or comply with section 409A of the Code. The provisions of this Award shall be construed and interpreted in accordance with section 409A of the Code. Notwithstanding any other provision of this Award Agreement to the contrary, if any payment or benefit hereunder is subject to section 409A of the Code,

and if such payment or benefit is to be paid or provided on account of the Participant's termination of employment (or other separation from service):

(a) and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment or benefit is required to be made or provided prior to the first day of the seventh month following the Participant's separation from service or termination of employment, such payment or benefit shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service; and

(b) the determination as to whether the Participant has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

TENNECO INC.

____

Senior Vice President and Chief Human Resources Officer

ACCEPTED:

____

Type or Print Legal Name (Date)

____

Signature

____

Social Security Number or National ID

____

Street Address

____

City/State/Zip/Country

APPENDIX A[1]

DRiV DIVISION

DEFINITIONS AND CALCULATION METHODOLOGIES

Cumulative Division Cash

"Cumulative Division Cash" means the Division Cash for the entire Performance Period or portion of Performance Period, as applicable for the calculation for which Cumulative Division Cash is to be determined.

"Division Cash" means, with respect to the DRiV Division for any calendar year, the reported EBITDA for the calendar year for the Division, (i) plus (gain)/loss on asset sales, (ii) plus the expense of stock-based compensation, (iii) minus the increase/(decrease) in operating working capital, (iv) plus other operating cash flows, (v) minus cash paid for property, plant and equipment, (vi) minus cash paid for software-related intangibles, (vii) plus proceeds from asset sales, (viii) minus payments for net assets purchased, (ix) plus changes in other long-term operating assets and liabilities, (x) plus adjustments to exclude the impact of acquisitions and divestitures, (xi) plus adjustments to exclude the impact of litigation or claim judgments and settlements, and (xii) other significant adjustments approved by the Committee. This definition is in line with management's internal reporting of what is termed "divisional cash flow".

"EBITDA" means earnings before interest expense, income taxes and non-controlling interests, and depreciation and amortization expenses, as determined in accordance with normal business practices.

In the event that Cumulative Division Cash is to be determined based on a period other than a full calendar year pursuant to Paragraph 3(e) of the Award Agreement, Cumulative Division Cash shall be calculated on a pro rata basis to reflect the portion of the Performance Period elapsed through the date of the applicable determination.

Cumulative Division EBITDA

"Cumulative Division EBITDA" means the Division EBITDA for the entire Performance Period or portion of the Performance Period, as applicable, for the calculation for which Cumulative Division EBITDA is to be determined.

"Division EBITDA" means, with respect to the DRiV Division for any calendar year, the reported EBITDA for the DRiV Division for such calendar year, adjusted, if material, for (i) gains or losses on sales of assets, (ii) restructuring charges, (iii) asset impairments, (iv) asset write-downs, (v) litigation or claim judgments or settlements, (vi) the effect of changes in tax laws, accounting principles or other laws or provisions affecting reported results, (vii) accruals for reorganization and restructuring programs, (viii) gains and losses that are treated as unusual in nature or that occur infrequently as defined under Accounting Standards Codification Topic 225 and/or in management's discussion and analysis of financial condition and results of operations for the DRiV Division appearing in the Company's annual report to stockholders for the applicable year, (ix) acquisitions or divestitures, and (x) other significant adjustments approved by the Committee.

In the event that Cumulative Division EBITDA is to be determined based on a period other than a full calendar year pursuant to Paragraph 3(e) of the Award Agreement, Cumulative Division EBITDA shall be calculated on a pro rata basis to reflect the portion of the Performance Period elapsed through the date of the applicable determination.

[1] This will be attached to awards for employees in the DRiV Division.

APPENDIX A[2]
NEW TENNECO DIVISION

DEFINITIONS AND CALCULATION METHODOLOGIES

Cumulative Division Cash

"Cumulative Division Cash" means the Division Cash for the entire Performance Period or portion of Performance Period, as applicable for the period for which Cumulative Division Cash is to be determined.

"Division Cash" means, with respect to the New Tenneco Division for any calendar year, the reported EBITDA for the calendar year for the Division, (i) plus (gain)/loss on asset sales, (ii) plus the expense of stock-based compensation, (iii) minus the increase/(decrease) in operating working capital, (iv) plus other operating cash flows, (v) minus cash paid for property, plant and equipment, (vi) minus cash paid for software-related intangibles, (vii) plus proceeds from asset sales, (viii) minus payments for net assets purchased, (ix) plus changes in other long-term operating assets and liabilities, (x) plus adjustments to exclude the impact of acquisitions and divestitures, (xi) plus adjustments to exclude the impact of litigation or claim judgments and settlements, and (xii) other significant adjustments approved by the Committee. This definition is in line with management's internal reporting of what is termed "divisional cash flow".

"EBITDA" means earnings before interest expense, income taxes and non-controlling interests, and depreciation and amortization expenses, as determined in accordance with normal business practices.

In the event that Cumulative Division Cash is to be determined based on a period other than a full calendar year pursuant to Paragraph 3(e) of the Award Agreement, Cumulative Division Cash shall be calculated on a pro rata basis to reflect the portion of the Performance Period elapsed through the date of the applicable determination.

Cumulative Division EBITDA

"Cumulative Division EBITDA" means the Division EBITDA for the entire Performance Period or portion of the Performance Period, as applicable, for the calculation for which Cumulative Division EBITDA is to be determined.

"Division EBITDA" means, with respect to the New Tenneco Division for any calendar year, the reported EBITDA for the New Tenneco Division for such calendar year, adjusted, if material, for (i) gains or losses on sales of assets, (ii) restructuring charges, (iii) asset impairments, (iv) asset write-downs, (v) litigation or claim judgments or settlements, (vi) the effect of changes in tax laws, accounting principles or other laws or provisions affecting reported results, (vii) accruals for reorganization and restructuring programs, (viii) gains and losses that are treated as unusual in nature or that occur infrequently as defined under Accounting Standards Codification Topic 225 and/or in management's discussion and analysis of financial condition and results of operations for the New Tenneco Division appearing in the Company's annual report to stockholders for the applicable year, (ix) acquisitions or divestitures, and (x) other significant adjustments approved by the Committee.

In the event that Cumulative Division EBITDA is to be determined based on a period other than a full calendar year pursuant to Paragraph 3(e) of the Award Agreement, Cumulative Division EBITDA shall be calculated on a pro rata basis to reflect the portion of the Performance Period elapsed through the date of the applicable determination.

[2] This will be attached to awards for employees in the New Tenneco Division.

APPENDIX A[3]
ENTERPRISE PARTICIPANTS

DEFINITIONS AND CALCULATION METHODOLOGIES

Cumulative Division Cash

"Cumulative Division Cash" means the Division Cash for the entire Performance Period or portion of Performance Period, as applicable for the calculation for which Cumulative Division Cash is to be determined.

"Division Cash" means, with respect to the DRiV Division or the New Tenneco Division, as applicable, for any calendar year, the reported EBITDA for the calendar year for the Division, (i) plus (gain)/loss on asset sales, (ii) plus the expense of stock-based compensation, (iii) minus the increase/(decrease) in operating working capital, (iv) plus other operating cash flows, (v) minus cash paid for property, plant and equipment, (vi) minus cash paid for software-related intangibles, (vii) plus proceeds from asset sales, (viii) minus payments for net assets purchased, (ix) plus changes in other long-term operating assets and liabilities, (x) plus adjustments to exclude the impact of acquisitions and divestitures, (xi) plus adjustments to exclude the impact of litigation or claim judgments and settlements, and (xii) other significant adjustments approved by the Committee. This definition is in line with management's internal reporting of what is termed "divisional cash flow".

"EBITDA" means earnings before interest expense, income taxes and non-controlling interests, and depreciation and amortization expenses, as determined in accordance with normal business practices.

In the event that Cumulative Division Cash is to be determined based on a period other than a full calendar year pursuant to Paragraph 3(e) of the Award Agreement, Cumulative Division Cash shall be calculated on a pro rata basis to reflect the portion of the Performance Period elapsed through the date of the applicable determination.

Cumulative Division EBITDA

"Cumulative Division EBITDA" means the Division EBITDA for the entire Performance Period or portion of the Performance Period, as applicable, for the calculation for which Cumulative Division EBITDA is to be determined.

"Division EBITDA" means, with respect to the DRiV Division or the New Tenneco Division, as applicable, for any calendar year, the reported EBITDA for the DRiV Division for such calendar year, adjusted, if material, for (i) gains or losses on sales of assets, (ii) restructuring charges, (iii) asset impairments, (iv) asset write-downs, (v) litigation or claim judgments or settlements, (vi) the effect of changes in tax laws, accounting principles or other laws or provisions affecting reported results, (vii) accruals for reorganization and restructuring programs, (viii) gains and losses that are treated as unusual in nature or that occur infrequently as defined under Accounting Standards Codification Topic 225 and/or in management's discussion and analysis of financial condition and results of operations for the DRiV Division or the New Tenneco Division, as applicable, appearing in the Company's annual report to stockholders for the applicable year, (ix) acquisitions or divestitures, and (x) other significant adjustments approved by the Committee.

In the event that Cumulative Division EBITDA is to be determined based on a period other than a full calendar year pursuant to Paragraph 3(e) of the Award Agreement, Cumulative Division EBITDA shall be calculated on a pro rata basis to reflect the portion of the Performance Period elapsed through the date of the applicable determination.

[3] This will be attached to awards for employees who are designated as Enterprise Participants.

EXHIBIT 10.53

TENNECO INC. 2006 LONG-TERM INCENTIVE PLAN
CASH-SETTLED RESTRICTED STOCK UNIT AWARD AGREEMENT

____
Participant Name

Division Allocation as of Grant Date: [DRiV or New Tenneco]

Effective as of **[Grant Date]** (the "Grant Date"), the Participant has been granted a Full Value Award under the Tenneco Inc. 2006 Long-Term Incentive Plan (the "Plan") in the form of [Number of Awards Granted] cash-settled restricted stock units ("Restricted Stock Units"), where each vested Restricted Stock Unit shall have a value equal to the Fair Market Value of one share of Common Stock on the applicable Settlement Date (as defined herein). The Award is subject to the following terms and conditions (sometimes referred to as this "Award Agreement") and the terms and conditions of the Plan as the same has been and may be amended from time to time. Terms used in this Award Agreement are defined elsewhere in this Award Agreement; provided, however, that, capitalized terms used herein and not otherwise defined shall have the meaning set forth in the Plan.

1. <u>Dividend Cash Amounts</u>. This Award contains the right to receive cash credits to a hypothetical bookkeeping account (a "Dividend Cash Account") in respect of dividends paid with respect to shares of Common Stock in accordance with the following:

(a) If a dividend with respect to shares of Common Stock is payable in cash, then, as of the applicable dividend payment date, the Participant's Dividend Cash Account shall be credited with an amount (a "Dividend Cash Amount") equal to (i) the cash dividend payable with respect to a share of Common Stock, multiplied by (ii) the number of Restricted Stock Units outstanding on the applicable dividend record date.

(b) If a dividend with respect to shares of Common Stock is payable in shares of Common Stock, then, as of the applicable dividend payment date, the Participant's Dividend Cash Account shall be credited with a Dividend Cash Amount in an amount equal to (i) the number of shares of Common Stock distributed in the dividend with respect to a share of Common Stock, divided by (ii) the Fair Market Value of a share of Common Stock on the dividend payment date, multiplied by (iii) the number of Restricted Stock Units outstanding on the applicable dividend record date.

The Dividend Cash Amounts credited to the Participant's Dividend Cash Account shall be subject to the same vesting provisions as the Restricted Stock Units to which the Dividend Cash Amounts relate and shall be settled in accordance with Paragraph 4. No Dividend Cash Amounts with respect to a Restricted Stock Unit shall be credited under this Award Agreement for any period after the Vesting Date (as defined in Paragraph 2) applicable to such Restricted Stock Unit. Amounts credited to a Participant's Dividend Cash Account shall not be credited with any investment earnings.

2. <u>Vesting and Forfeiture of Restricted Stock Units and Dividend Cash Amounts</u>. All Restricted Stock Units and Dividend Cash Amounts credited to the Participant's Dividend Cash Account shall be unvested unless and until they become vested and nonforfeitable in accordance with this Paragraph 2. Subject to the terms and conditions of this Award Agreement and the Plan, [one-third (1/3) of the Restricted Stock Units and associated Dividend Cash Amounts awarded hereunder shall vest on each of the first, second and third anniversary of the Grant Date (each a "Vesting Date")], provided that the Participant is continuously employed by the Company or a Subsidiary through the applicable Vesting Date. Notwithstanding the foregoing:

(a) if the Participant's Termination Date occurs by reason of Total Disability (as defined in Paragraph 3) or death, any unvested Restricted Stock Units that are outstanding on the Termination Date (and any associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement;

(b) if the Participant's Termination Date occurs by reason of Retirement (as defined in Paragraph 3) [after the first anniversary of the Grant Date], any unvested Restricted Stock Units that are outstanding on the Termination Date (and associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement;[1]

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

(c) in the event that the Participant is assigned to a special project with a limited scope (as approved by the Committee and communicated to the Participant) and if the Participant's Termination Date occurs as a result of termination by the Company for reasons other than for Cause (as defined in Paragraph 3), then any unvested portion of the Award that is outstanding on the Termination Date shall immediately vest on the Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement;

(d) in the event of a Change in Control other than a New Tenneco Transaction or a DRiV Transaction (each as defined in Paragraph 3), the terms of Article 6 of the Plan shall control;

(e) The following shall apply if a New Tenneco Transaction occurs:

(i) If the Participant is a New Tenneco Participant, any unvested Restricted Stock Units that are outstanding on the date of the New Tenneco Transaction (and any associated Dividend Cash Amounts) shall immediately vest on the date of the New Tenneco Transaction and the date of the New Tenneco Transaction shall be the "Vesting Date" for purposes of this Award Agreement, and

(ii) If the Participant is a DRiV Participant, any outstanding unvested Restricted Stock Units (and associated Dividend Cash Amounts) shall be paid and settled as of the Settlement Date (determined in accordance with Paragraph 4) provided that the DRiV Participant's Termination Date does not occur prior to the Settlement Date; provided, however, that if the DRiV Participant's Termination Date occurs prior to the Settlement Date as a result of death, Total Disability or a termination by the Company or a Subsidiary for reasons other than Cause, any unvested Restricted Stock Units that are outstanding on the Termination Date (and associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement;

(f) The following shall apply if a DRiV Transaction that is a sale of DRiV occurs:

(i) If the Participant is a DRiV Participant, any unvested Restricted Stock Units that are outstanding on the date of the DRiV Transaction (and any associated Dividend Cash Amounts) shall immediately vest on the date of the DRiV Transaction and the date of the DRiV Transaction shall be the "Vesting Date" for purposes of this Award Agreement, and

(ii) If the Participant is a New Tenneco Participant, any outstanding unvested Restricted Stock Units (and associated Dividend Cash Amounts) shall be paid and settled as of the Settlement Date (determined in accordance with Paragraph 4) provided that the New Tenneco Participant's Termination Date does not occur prior to the Settlement Date; provided, however, that if the New Tenneco's Termination Date occurs prior to the Settlement Date as a result of death, Total Disability or a termination by the Company or a Subsidiary for reasons other than Cause, any unvested Restricted Stock Units that are outstanding on the Termination Date (and associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement; and

(g) If a DRiV Transaction occurs that is a spin-off of DRiV, the provisions of this Agreement shall continue to apply without regard to the DRiV Transaction.

All Restricted Stock Units and associated Dividend Cash Amounts that are not vested upon the Participant's Termination Date shall immediately expire and shall be forfeited and the Participant shall have no further rights thereto. In addition, this Award is subject to forfeiture if the Participant fails to accept the Award within the first twelve (12) months following the Grant Date in accordance with procedures established by the Company. In the event of forfeiture for any reason, the balance in the Participant's Dividend Cash Account shall be reduced by the amount of any Dividend Cash Amounts that are forfeited.

3. Special Definitions. For purposes of this Award Agreement, the following terms shall have the meaning specified:

(a) "Cause" means, with respect to the Participant, (i) fraud, embezzlement, or theft in connection with his or her employment, (ii) gross negligence in the performance of his or her duties, (iii) his or her conviction, guilty plea, or plea of nolo contendere with respect to a felony, (iv) the willful and continued failure to substantially perform his or her duties for the Company or any of its Subsidiaries (except where the failure results from

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

incapacity due to disability), (v) the failure to meet the obligations required by his or her position, as determined in the reasonable discretion of the Committee, or (vi) the willful or negligent engagement in conduct which is, or could reasonably be expected to be, materially injurious to any of the Company or any of its Subsidiaries, monetarily or otherwise. For purposes of the foregoing, no act, or failure to act, on the part of the Participant shall be deemed "willful" unless done, or omitted to be done, by the Participant not in good faith and without reasonable belief that his or her act, or failure to act, was in the best interest of the Company and its Subsidiaries.

(b) "DRiV Participant" means a Participant who is employed primarily in the Company's DRiV Division as of the relevant date of determination for purposes of Paragraph 2(e) or (f). The Participant's Division Allocation as of the Grant Date is reflected above. Nothing herein shall prohibit or restrict the Company or the Committee from changing the Participant's Division Allocation prior to the relevant date of determination for purposes of Paragraph 2(e) or (f). For the avoidance of doubt, the Participant's Division Allocation for purposes of this Agreement applies solely for purposes of this Agreement.

(c) "DRiV Transaction" means (i) a sale or (ii) spin-off, in each case of the Company's DRiV Division (consisting primarily of the Company's Global Motorparts business group and Global Ride Performance business group and applicable reporting lines thereunder as determined from time to time by the Company); provided, however, that a sale of the DRiV Division shall not constitute a DRiV Transaction unless the sale constitutes a sale of all or substantially all of the DRiV Division. A DRiV Transaction shall not constitute a Change in Control for purposes of this Award Agreement even if it otherwise constitutes a Change in Control for purposes of the Plan.

(d) "New Tenneco Participant" means a Participant who is employed primarily in the Company's New Tenneco Division as of the relevant date of determination for purposes of Paragraph 2(e) or (f). The Participant's Division Allocation as of the Grant Date is reflected above. Nothing herein shall prohibit or restrict the Company or the Committee from changing the Participant's Division Allocation prior to the relevant date of determination for purposes of Paragraph 2(e) or (f). For the avoidance of doubt, the Participant's Division Allocation for purposes of this Agreement applies solely for purposes of this Agreement.

(e) "New Tenneco Transaction" means a sale of the Company's New Tenneco Division (consisting primarily of the Company's Global Clean Air business group and Global Powertrain business group and applicable reporting lines thereunder as determined from time to time by the Company); provided, however, that a sale of the New Tenneco Division shall not constitute a New Tenneco Transaction unless the sale constitutes a sale of all or substantially all of the New Tenneco Division. A New Tenneco Transaction shall not constitute a Change in Control for purposes of this Award Agreement even if it otherwise constitutes a Change in Control for purposes of the of the Plan.

(f) "Retirement" means the Participant's termination of employment with the Company and its Subsidiaries after the date on which the Participant attains (A) age 65 or (B) age 55 and has completed at least 10 years of service with the Company and its Subsidiaries and is not for any other reason, including voluntary resignation, termination by the Company or a Subsidiary for cause, which shall include the failure of the Participant to meet the obligations required by his or her position (as determined in the reasonable discretion of the Company), or termination by the Participant for good reason or constructive discharge.

(g) "Total Disability" means an event that results in the Participant being (i) unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, or (ii) by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, receiving income replacement benefits for a period of not less than three (3) months under an accident and health plan covering employees of the Company or its Subsidiaries.

4. Settlement and Payment. Subject to the terms and conditions of this Award Agreement, Restricted Stock Units and associated Dividend Cash Amounts that have become vested in accordance with Paragraph 2 shall be paid and settled as of the applicable Vesting Date. The date on which payment and settlement occurs is referred to as the "Settlement Date." Unless otherwise determined by the Committee in accordance with the terms of the Plan, (a) settlement of the vested Restricted Stock Units on a Settlement Date shall be made in the form of an amount of cash equal to the Fair Market Value of a share of Common Stock for each Restricted Stock Unit being settled as of such Settlement Date, plus an amount of cash equal to the

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Fair Market Value of any fractional Restricted Stock Unit being settled as of such Settlement Date and (b) settlement of the vested Dividend Cash Amounts on a Settlement Date shall be paid in a cash lump sum payment. Upon the settlement of any vested Restricted Stock Units such Restricted Stock Units shall be cancelled and upon payment of any Dividend Cash Amounts the balance in the Participant's Dividend Cash Account shall be reduced by the amount paid to the Participant pursuant to subparagraph (b).

5. Withholding. All Awards and distributions under the Plan, including this Award and any distribution in respect of this Award, are subject to withholding of all applicable taxes, and the delivery of any cash or other benefits under the Plan or this Award is conditioned on satisfaction of the applicable tax withholding obligations. Such withholding obligations may be satisfied, at the Participant's election, (a) through cash payment by the Participant or (b) through the surrender of cash to which the Participant is otherwise entitled under the Plan (including this Award); provided, however, that any withholding obligations with respect to any Participant shall be satisfied by the method set forth in subparagraph (b) of this Paragraph 5 (through the withholding of cash otherwise payable pursuant to this Award) unless the Participant otherwise elects in accordance with this Paragraph 5.

6. Transferability. This Award is not transferable except as designated by the Participant by will or by the laws of descent and distribution or pursuant to a qualified domestic relations order.

7. Heirs and Successors. If any benefits deliverable to the Participant under this Award Agreement have not been delivered at the time of the Participant's death, such benefits shall be delivered to the Participant's Designated Beneficiary, in accordance with the provisions of this Award Agreement. The "Designated Beneficiary" shall be the beneficiary or beneficiaries designated by the Participant in a writing filed with the Company in such form and at such time as the Company shall require and in accordance with such rules and procedures established by the Company. If a deceased Participant fails to designate a beneficiary, or if the Designated Beneficiary does not survive the Participant, any rights that would have been exercisable by the Participant and any benefits distributable to the Participant shall be distributed to the legal representative of the estate of the Participant.

8. Administration. The authority to administer and interpret this Award and this Award Agreement shall be vested in the Committee, and the Committee shall have all powers with respect to this Award and this Award Agreement as it has with respect to the Plan. Any interpretation of this Award or this Award Agreement by the Committee and any decision made by it with respect to this Award or this Award Agreement is final and binding on all persons. Notwithstanding the foregoing, an "Administrative Committee" consisting of the Chief Executive Officer of the Company, the Chief Financial Officer of the Company, and the Chief Human Resources Officer of the Company shall have all of the rights, powers, duties, authorities, and obligations of, the Committee under this Award Agreement with respect to allocating the Participant (or modifying the Participant's allocation) to the DRiV Division or the New Tenneco Division based on the services provided by the Participant or as determined appropriate in the case of a transaction described in Paragraph 2(e) or (f); provided, however, that the Administrative Committee may not take any action with respect to any Participant who is determined by the Company to be an officer of the Company for purposes of Section 16 of the Securities Exchange Act of 1934, as amended. The action of any individual Administrative Committee member consistent with the authority delegated to the Administrative Committee shall be considered to be action of the Committee.

9. Addendum to Award Agreement. Notwithstanding any provision of this Award Agreement, if the Participant resides and/or works outside the United States of America (the "United States," "U.S." or "U.S.A."), this Award shall be subject to the special terms and conditions set forth in the addendum to this Award Agreement (the "Addendum") for the Participant's country. Further, if the Participant transfers residence and/or employment to another country reflected in the Addendum, the special terms and conditions for such country will apply to the Participant to the extent the Company determines, in its sole discretion, that the application of such special terms and conditions is necessary or advisable for legal or administrative reasons (or the Company may establish alternative terms and conditions as may be necessary or advisable to accommodate Participant's transfer). The Addendum shall constitute part of this Award Agreement.

10. Adjustment of Award. The number of Restricted Stock Units awarded pursuant to this Award may be adjusted by the Committee in accordance with the Plan to reflect certain corporate transactions which affect the number, type or value of the Restricted Stock Units.

11. Notices. Any notice required or permitted under this Award Agreement shall be deemed given when delivered personally, or when deposited in a United States Post Office, postage prepaid, addressed, as appropriate, to the Committee or the Company at the Company's principal offices, to the Participant at the Participant's address as last known by the Company or, in any case, such other address as one party may designate in writing to the other.

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

12. Governing Law. The validity, construction and effect of this Award Agreement shall be determined in accordance with the laws of the State of Illinois and applicable federal law.

13. Amendments. The Board may, at any time, amend or terminate the Plan, and the Committee may amend this Award Agreement, provided that, except as provided in the Plan, no amendment or termination may, in the absence of written consent to the change by the affected Participant (or, if the Participant is not then living, the affected beneficiary), adversely affect the rights of any Participant or beneficiary under this Award Agreement prior to the date such amendment or termination is adopted by the Board or the Committee, as the case may be.

14. Award Not Contract of Employment. The Award does not constitute a contract of employment or continued service, and the grant of the Award shall not give the Participant the right to be retained in the employ or service of the Company or any Subsidiary, nor any right or claim to any benefit under the Plan or this Award Agreement, unless such right or claim has specifically accrued under the terms of the Plan and this Award Agreement.

15. Unfunded Obligation. The Award shall not be funded, no trust, escrow or other provisions shall be established to secure payments and distributions due hereunder and this Award shall be regarded as unfunded for purposes of the Employee Retirement Income Security Act of 1974, as amended, and the Code. The Participant shall be treated as a general, unsecured creditor of the Company with respect to amounts payable hereunder, and shall have no rights to any specific assets of the Company. Without limiting the generality of the foregoing, any amounts credited to the Dividend Cash Account will remain general assets of the Company and shall be payable solely from the general assets of the Company.

16. Severability. If a provision of this Award Agreement is held invalid by a court of competent jurisdiction, the remaining provisions shall nonetheless be enforceable according to their terms. Further, if any provision is held to be overbroad as written, that provision shall be amended to narrow its application to the extent necessary to make the provision enforceable according to applicable law and enforced as amended.

17. Plan Governs; Other Terms. The Award evidenced by this Award Agreement is granted pursuant to the Plan, and this Award and this Award Agreement are in all respects governed by the Plan and subject to all of the terms and provisions thereof, whether such terms and provisions are incorporated in this Award Agreement by reference or are expressly cited. Notwithstanding any other provision of the Plan or this Award Agreement, (a) all Awards are subject to the Company's recoupment or clawback policies as applicable and as in effect from time to time and (b) if the Committee determines, in its sole discretion, that the Participant at any time has willfully engaged in any activity that the Committee determines was or is harmful to the Company or any of its Subsidiaries, any unpaid portion of the Award shall be forfeited and the Participant shall have no rights with respect thereto.

18. Counterparts. This Award Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original and all of which together shall constitute one and the same instrument.

19. Special Section 409A Rules. It is intended that any amounts payable under this Award Agreement shall either be exempt from or comply with section 409A of the Code. The provisions of this Award shall be construed and interpreted in accordance with section 409A of the Code. Notwithstanding any other provision of this Award Agreement to the contrary, if any payment or benefit hereunder is subject to section 409A of the Code, and if such payment or benefit is to be paid or provided on account of the Participant's termination of employment (or other separation from service):

(a) and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment or benefit is required to be made or provided prior to the first day of the seventh month following the Participant's separation from service or termination of employment, such payment or benefit shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service; and

(b) the determination as to whether the Participant has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

ACCEPTED:

PARTICIPANT: TENNECO INC.:

______________________________ ______________________________

Electronic Signature Senior Vice President and Chief Human Resources Officer

____

Acceptance Date

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

EXHIBIT 10.54

TENNECO INC. 2006 LONG-TERM INCENTIVE PLAN
RESTRICTED STOCK UNIT AWARD AGREEMENT

____
Participant Name

Division Allocation as of Grant Date: [DRiV or New Tenneco]

Effective as of **[Grant Date]** (the "Grant Date"), the Participant has been granted a Full Value Award under the Tenneco Inc. 2006 Long-Term Incentive Plan (the "Plan") in the form of restricted stock units with respect to [Number of Awards Granted] shares of Common Stock ("Restricted Stock Units"). The Award is subject to the following terms and conditions (sometimes referred to as this "Award Agreement") and the terms and conditions of the Plan as the same has been and may be amended from time to time. Terms used in this Award Agreement are defined elsewhere in this Award Agreement; provided, however, that, capitalized terms used herein and not otherwise defined shall have the meaning set forth in the Plan.

1. Dividend Cash Amounts. This Award contains the right to receive cash credits to a hypothetical bookkeeping account (a "Dividend Cash Account") in respect of dividends paid with respect to shares of Common Stock in accordance with the following:

(a) If a dividend with respect to shares of Common Stock is payable in cash, then, as of the applicable dividend payment date, the Participant's Dividend Cash Account shall be credited with an amount (a "Dividend Cash Amount") equal to (i) the cash dividend payable with respect to a share of Common Stock, multiplied by (ii) the number of Restricted Stock Units outstanding on the applicable dividend record date.

(b) If a dividend with respect to shares of Common Stock is payable in shares of Common Stock, then, as of the applicable dividend payment date, the Participant's Dividend Cash Account shall be credited with a Dividend Cash Amount in an amount equal to (i) the number of shares of Common Stock distributed in the dividend with respect to a share of Common Stock, divided by (ii) the Fair Market Value of a share of Common Stock on the dividend payment date, multiplied by (iii) the number of Restricted Stock Units outstanding on the applicable dividend record date.

The Dividend Cash Amounts credited to the Participant's Dividend Cash Account shall be subject to the same vesting provisions as the Restricted Stock Units to which the Dividend Cash Amounts relate and shall be settled in accordance with Paragraph 4. No Dividend Cash Amounts with respect to a Restricted Stock Unit shall be credited under this Award Agreement for any period after the Vesting Date (as defined in Paragraph 2) applicable to such Restricted Stock Unit. Amounts credited to a Participant's Dividend Cash Account shall not be credited with any investment earnings.

2. Vesting and Forfeiture of Restricted Stock Units and Dividend Cash Amounts. All Restricted Stock Units and Dividend Cash Amounts credited to the Participant's Dividend Cash Account shall be unvested unless and until they become vested and nonforfeitable in accordance with this Paragraph 2. Subject to the terms and conditions of this Award Agreement and the Plan, [one-third (1/3) of the Restricted Stock Units and associated Dividend Cash Amounts awarded hereunder shall vest on each of the first, second and third anniversary of the Grant Date (each a "Vesting Date")], provided that the Participant is continuously employed by the Company or a Subsidiary through the applicable Vesting Date. Notwithstanding the foregoing:

(a) if the Participant's Termination Date occurs by reason of Total Disability (as defined in Paragraph 3) or death, any unvested Restricted Stock Units that are outstanding on the Termination Date (and any associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement;

(b) if the Participant's Termination Date occurs by reason of Retirement (as defined in Paragraph 3) [after the first anniversary of the Grant Date], any unvested Restricted Stock Units that are outstanding on the Termination Date (and associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement;[1]

(c) in the event that the Participant is assigned to a special project with a limited scope (as approved by the Committee and communicated to the Participant) and if the Participant's Termination Date occurs as a result of termination by the Company for reasons other than for Cause (as defined in Paragraph 3), then any unvested portion of the Award that is outstanding on the Termination Date shall immediately vest on the

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement;

(d) in the event of a Change in Control other than a New Tenneco Transaction or a DRiV Transaction (each as defined in Paragraph 3), the terms of Article 6 of the Plan shall control;

(e) The following shall apply if a New Tenneco Transaction occurs:

(i) If the Participant is a New Tenneco Participant, any unvested Restricted Stock Units that are outstanding on the date of the New Tenneco Transaction (and any associated Dividend Cash Amounts) shall immediately vest on the date of the New Tenneco Transaction and the date of the New Tenneco Transaction shall be the "Vesting Date" for purposes of this Award Agreement, and

(ii) If the Participant is a DRiV Participant, any outstanding unvested Restricted Stock Units (and associated Dividend Cash Amounts) shall be paid and settled as of the Settlement Date (determined in accordance with Paragraph 4) provided that the DRiV Participant's Termination Date does not occur prior to the Settlement Date; provided, however, that if the DRiV Participant's Termination Date occurs prior to the Settlement Date as a result of death, Total Disability or a termination by the Company or a Subsidiary for reasons other than Cause, any unvested Restricted Stock Units that are outstanding on the Termination Date (and associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement;

(f) The following shall apply if a DRiV Transaction that is a sale of DRiV occurs:

(i) If the Participant is a DRiV Participant, any unvested Restricted Stock Units that are outstanding on the date of the DRiV Transaction (and any associated Dividend Cash Amounts) shall immediately vest on the date of the DRiV Transaction and the date of the DRiV Transaction shall be the "Vesting Date" for purposes of this Award Agreement, and

(ii) If the Participant is a New Tenneco Participant, any outstanding unvested Restricted Stock Units (and associated Dividend Cash Amounts) shall be paid and settled as of the Settlement Date (determined in accordance with Paragraph 4) provided that the New Tenneco Participant's Termination Date does not occur prior to the Settlement Date; provided, however, that if the New Tenneco's Termination Date occurs prior to the Settlement Date as a result of death, Total Disability or a termination by the Company or a Subsidiary for reasons other than Cause, any unvested Restricted Stock Units that are outstanding on the Termination Date (and associated Dividend Cash Amounts) shall immediately vest on the Termination Date and the Termination Date shall be the "Vesting Date" for purposes of this Award Agreement; and

(g) If a DRiV Transaction occurs that is a spin-off of DRiV, the provisions of this Agreement shall continue to apply without regard to the DRiV Transaction.

All Restricted Stock Units and associated Dividend Cash Amounts that are not vested upon the Participant's Termination Date shall immediately expire and shall be forfeited and the Participant shall have no further rights thereto. In addition, this Award is subject to forfeiture if the Participant fails to accept the Award within the first twelve (12) months following the Grant Date in accordance with procedures established by the Company. In the event of forfeiture for any reason, the balance in the Participant's Dividend Cash Account shall be reduced by the amount of any Dividend Cash Amounts that are forfeited.

3. Special Definitions. For purposes of this Award Agreement, the following terms shall have the meaning specified:

(a) "Cause" means, with respect to the Participant, (i) fraud, embezzlement, or theft in connection with his or her employment, (ii) gross negligence in the performance of his or her duties, (iii) his or her conviction, guilty plea, or plea of nolo contendere with respect to a felony, (iv) the willful and continued failure to substantially perform his or her duties for the Company or any of its Subsidiaries (except where the failure results from incapacity due to disability), (v) the failure to meet the obligations required by his or her position, as determined in the reasonable discretion of the Committee, or (vi) the willful or negligent engagement in conduct which is, or could reasonably be expected to be, materially injurious to any of the Company or any

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

of its Subsidiaries, monetarily or otherwise. For purposes of the foregoing, no act, or failure to act, on the part of the Participant shall be deemed "willful" unless done, or omitted to be done, by the Participant not in good faith and without reasonable belief that his or her act, or failure to act, was in the best interest of the Company and its Subsidiaries.

(b) "DRiV Participant" means a Participant who is employed primarily in the Company's DRiV Division as of the relevant date of determination for purposes of Paragraph 2(e) or (f). The Participant's Division Allocation as of the Grant Date is reflected above. Nothing herein shall prohibit or restrict the Company or the Committee from changing the Participant's Division Allocation prior to the relevant date of determination for purposes of Paragraph 2(e) or (f). For the avoidance of doubt, the Participant's Division Allocation for purposes of this Agreement applies solely for purposes of this Agreement.

(c) "DRiV Transaction" means (i) a sale or (ii) spin-off, in each case of the Company's DRiV Division (consisting primarily of the Company's Global Motorparts business group and Global Ride Performance business group and applicable reporting lines thereunder as determined from time to time by the Company); provided, however, that a sale of the DRiV Division shall not constitute a DRiV Transaction unless the sale constitutes a sale of all or substantially all of the DRiV Division. A DRiV Transaction shall not constitute a Change in Control for purposes of this Award Agreement even if it otherwise constitutes a Change in Control for purposes of the Plan.

(d) "New Tenneco Participant" means a Participant who is employed primarily in the Company's New Tenneco Division as of the relevant date of determination for purposes of Paragraph 2(e) or (f). The Participant's Division Allocation as of the Grant Date is reflected above. Nothing herein shall prohibit or restrict the Company or the Committee from changing the Participant's Division Allocation prior to the relevant date of determination for purposes of Paragraph 2(e) or (f). For the avoidance of doubt, the Participant's Division Allocation for purposes of this Agreement applies solely for purposes of this Agreement.

(e) "New Tenneco Transaction" means a sale of the Company's New Tenneco Division (consisting primarily of the Company's Global Clean Air business group and Global Powertrain business group and applicable reporting lines thereunder as determined from time to time by the Company); provided, however, that a sale of the New Tenneco Division shall not constitute a New Tenneco Transaction unless the sale constitutes a sale of all or substantially all of the New Tenneco Division. A New Tenneco Transaction shall not constitute a Change in Control for purposes of this Award Agreement even if it otherwise constitutes a Change in Control for purposes of the of the Plan.

(f) "Retirement" means the Participant's termination of employment with the Company and its Subsidiaries after the date on which the Participant attains (A) age 65 or (B) age 55 and has completed at least 10 years of service with the Company and its Subsidiaries and is not for any other reason, including voluntary resignation, termination by the Company or a Subsidiary for cause, which shall include the failure of the Participant to meet the obligations required by his or her position (as determined in the reasonable discretion of the Company), or termination by the Participant for good reason or constructive discharge.

(g) "Total Disability" means an event that results in the Participant being (i) unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, or (ii) by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, receiving income replacement benefits for a period of not less than three (3) months under an accident and health plan covering employees of the Company or its Subsidiaries.

4. Settlement and Payment. Subject to the terms and conditions of this Award Agreement, Restricted Stock Units and associated Dividend Cash Amounts that have become vested in accordance with Paragraph 2 shall be paid and settled as of the applicable Vesting Date. The date on which payment and settlement occurs is referred to as the "Settlement Date." Unless otherwise determined by the Committee in accordance with the terms of the Plan, (a) settlement of the vested Restricted Stock Units on a Settlement Date shall be made in the form of shares of Common Stock with one share of Common Stock being issued in settlement of each Restricted Stock Unit, plus an amount of cash equal to the Fair Market Value of any fractional Restricted Stock Unit being settled as of such Settlement Date and (b) settlement of the vested Dividend Cash Amounts on a Settlement Date shall be paid in a cash lump sum payment. Upon the settlement of any vested Restricted Stock

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

Units such Restricted Stock Units shall be cancelled and upon payment of any Dividend Cash Amounts the balance in the Participant's Dividend Cash Account shall be reduced by the amount paid to the Participant pursuant to subparagraph (b).

5. Withholding. All Awards and distributions under the Plan, including this Award and any distribution in respect of this Award, are subject to withholding of all applicable taxes, and the delivery of any cash or other benefits under the Plan or this Award is conditioned on satisfaction of the applicable tax withholding obligations. Such withholding obligations may be satisfied, at the Participant's election, (a) through cash payment by the Participant or (b) through the surrender of cash or shares of Common Stock to which the Participant is otherwise entitled under the Plan; provided, however, that any withholding obligations with respect to any Participant shall be satisfied by the method set forth in subparagraph (b) (through the withholding of shares otherwise payable pursuant to this Award) unless the Participant otherwise elects in accordance with this Paragraph 5; and provided further that any withholding with respect to payments of Dividend Cash Amounts shall be satisfied by the method set forth in subparagraph (a) of this Paragraph 5. The amount withheld in the form of shares of Common Stock under this Paragraph 5 may not exceed the minimum statutory withholding obligation (based on the minimum statutory withholding rates for Federal and state purposes, including, without limitation, payroll taxes) unless otherwise elected by the Participant, in no event shall the Participant be permitted to elect less than the minimum statutory withholding obligation, and in no event shall the Participant be permitted to elect to have an amount withheld in the form of shares of Common Stock pursuant to this Paragraph 5 that exceeds the maximum individual tax rate for the employee in applicable jurisdictions.

6. Transferability. This Award is not transferable except as designated by the Participant by will or by the laws of descent and distribution or pursuant to a qualified domestic relations order.

7. Heirs and Successors. If any benefits deliverable to the Participant under this Award Agreement have not been delivered at the time of the Participant's death, such benefits shall be delivered to the Participant's Designated Beneficiary, in accordance with the provisions of this Award Agreement. The "Designated Beneficiary" shall be the beneficiary or beneficiaries designated by the Participant in a writing filed with the Company in such form and at such time as the Company shall require and in accordance with such rules and procedures established by the Company. If a deceased Participant fails to designate a beneficiary, or if the Designated Beneficiary does not survive the Participant, any rights that would have been exercisable by the Participant and any benefits distributable to the Participant shall be distributed to the legal representative of the estate of the Participant.

8. Administration. The authority to administer and interpret this Award and this Award Agreement shall be vested in the Committee, and the Committee shall have all powers with respect to this Award and this Award Agreement as it has with respect to the Plan. Any interpretation of this Award or this Award Agreement by the Committee and any decision made by it with respect to this Award or this Award Agreement is final and binding on all persons. Notwithstanding the foregoing, an "Administrative Committee" consisting of the Chief Executive Officer of the Company, the Chief Financial Officer of the Company, and the Chief Human Resources Officer of the Company shall have all of the rights, powers, duties, authorities, and obligations of, the Committee under this Award Agreement with respect to allocating the Participant (or modifying the Participant's allocation) to the DRiV Division or the New Tenneco Division based on the services provided by the Participant or as determined appropriate in the case of a transaction described in Paragraph 2(e) or (f); provided, however, that the Administrative Committee may not take any action with respect to any Participant who is determined by the Company to be an officer of the Company for purposes of Section 16 of the Securities Exchange Act of 1934, as amended. The action of any individual Administrative Committee member consistent with the authority delegated to the Administrative Committee shall be considered to be action of the Committee.

9. Addendum to Award Agreement. Notwithstanding any provision of this Award Agreement, if the Participant resides and/or works outside the United States of America (the "United States," "U.S." or "U.S.A."), this Award shall be subject to the special terms and conditions set forth in the addendum to this Award Agreement (the "Addendum") for the Participant's country. Further, if the Participant transfers residence and/or employment to another country reflected in the Addendum, the special terms and conditions for such country will apply to the Participant to the extent the Company determines, in its sole discretion, that the application of such special terms and conditions is necessary or advisable for legal or administrative reasons (or the Company may establish alternative terms and conditions as may be necessary or advisable to accommodate Participant's transfer). The Addendum shall constitute part of this Award Agreement.

10. Adjustment of Award. The number of Restricted Stock Units awarded pursuant to this Award may be adjusted by the Committee in accordance with the Plan to reflect certain corporate transactions which affect the number, type or value of the Restricted Stock Units.

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

11. Notices. Any notice required or permitted under this Award Agreement shall be deemed given when delivered personally, or when deposited in a United States Post Office, postage prepaid, addressed, as appropriate, to the Committee or the Company at the Company's principal offices, to the Participant at the Participant's address as last known by the Company or, in any case, such other address as one party may designate in writing to the other.

12. Governing Law. The validity, construction and effect of this Award Agreement shall be determined in accordance with the laws of the State of Illinois and applicable federal law.

13. Amendments. The Board may, at any time, amend or terminate the Plan, and the Committee may amend this Award Agreement, provided that, except as provided in the Plan, no amendment or termination may, in the absence of written consent to the change by the affected Participant (or, if the Participant is not then living, the affected beneficiary), adversely affect the rights of any Participant or beneficiary under this Award Agreement prior to the date such amendment or termination is adopted by the Board or the Committee, as the case may be.

14. Award Not Contract of Employment. The Award does not constitute a contract of employment or continued service, and the grant of the Award shall not give the Participant the right to be retained in the employ or service of the Company or any Subsidiary, nor any right or claim to any benefit under the Plan or this Award Agreement, unless such right or claim has specifically accrued under the terms of the Plan and this Award Agreement.

15. Unfunded Obligation. The Award shall not be funded, no trust, escrow or other provisions shall be established to secure payments and distributions due hereunder and this Award shall be regarded as unfunded for purposes of the Employee Retirement Income Security Act of 1974, as amended, and the Code. The Participant shall be treated as a general, unsecured creditor of the Company with respect to amounts payable hereunder, and shall have no rights to any specific assets of the Company. Without limiting the generality of the foregoing, any amounts credited to the Dividend Cash Account will remain general assets of the Company and shall be payable solely from the general assets of the Company.

16. Severability. If a provision of this Award Agreement is held invalid by a court of competent jurisdiction, the remaining provisions shall nonetheless be enforceable according to their terms. Further, if any provision is held to be overbroad as written, that provision shall be amended to narrow its application to the extent necessary to make the provision enforceable according to applicable law and enforced as amended.

17. Plan Governs; Other Terms. The Award evidenced by this Award Agreement is granted pursuant to the Plan, and this Award and this Award Agreement are in all respects governed by the Plan and subject to all of the terms and provisions thereof, whether such terms and provisions are incorporated in this Award Agreement by reference or are expressly cited. Notwithstanding any other provision of the Plan or this Award Agreement, (a) all Awards are subject to the Company's recoupment or clawback policies as applicable and as in effect from time to time and (b) if the Committee determines, in its sole discretion, that the Participant at any time has willfully engaged in any activity that the Committee determines was or is harmful to the Company or any of its Subsidiaries, any unpaid portion of the Award shall be forfeited and the Participant shall have no rights with respect thereto.

18. Counterparts. This Award Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original and all of which together shall constitute one and the same instrument.

19. Special Section 409A Rules. It is intended that any amounts payable under this Award Agreement shall either be exempt from or comply with section 409A of the Code. The provisions of this Award shall be construed and interpreted in accordance with section 409A of the Code. Notwithstanding any other provision of this Award Agreement to the contrary, if any payment or benefit hereunder is subject to section 409A of the Code, and if such payment or benefit is to be paid or provided on account of the Participant's termination of employment (or other separation from service):

(a) and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment or benefit is required to be made or provided prior to the first day of the seventh month following the Participant's separation from service or termination of employment, such payment or benefit shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service; and

(b) the determination as to whether the Participant has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

ACCEPTED:

PARTICIPANT: TENNECO INC.:

Electronic Signature

Senior Vice President and Chief Human Resources Officer

Acceptance Date

[1] Bracketed language to be included at Committee discretion on a grant by grant basis.

EXHIBIT 10.55

CASH RETENTION AGREEMENT

This **CASH RETENTION AGREEMENT** (this "Agreement"), dated as of November 13, 2019 (the "Effective Date"), is by and between Tenneco Inc. ("Tenneco" together with its subsidiaries and affiliates, the "Company Group"), and Peng Guo (the "Executive").

WHEREAS, Tenneco has announced that it plans to separate its businesses into an Aftermarket and Ride Performance company and a Clean Air and Powertrain company during 2020 (the "Separation");

WHEREAS, the Executive has been involved in the transition process relating to Tenneco's acquisition of Federal Mogul LLC and the subsequent endeavors leading to the separation of Tenneco's businesses into two separate companies

WHEREAS, the continued services of the Executive are critical to Tenneco's strategy relating to separation of its businesses; and

WHEREAS, to incentivize the Executive to remain employed by the Company Group through such separation and for a period thereafter, Tenneco desires to enter into this Agreement and provide for the compensation specified herein to be paid to the Executive, subject to all of the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the premises and the respective covenants and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto, intending to be legally bound, hereby agree to the following:

1. Definitions. In addition to defined terms included elsewhere in this Agreement, the following capitalized terms when used herein shall have the meaning specified:

(a) "Cause" shall mean the Executive's: (i) willful failure to perform substantially his or her duties (other than any such failure resulting from incapacity due to Disability); (ii) commission of, or indictment for, a felony or any crime involving fraud or embezzlement or dishonesty or conviction of, or plea of guilty or nolo contendere to a crime or misdemeanor (other than a traffic violation) punishable by imprisonment under federal, state or local law; (ii) engagement in an act of fraud or other act of willful dishonesty or misconduct, towards the Company Group or any member thereof, or detrimental to Company Group or any member thereof, or in the performance of the Executive's duties; (iv) negligence in the performance of employment duties that has a materially detrimental effect on the Company Group or any member thereof; (v) violation of a federal or state securities law or regulation; (vi) the use of a controlled substance without a prescription or the use of alcohol which, while performing services on behalf of the Company Group or any member thereof, in each case, significantly impairs the Executive's ability to carry out his or her duties and responsibilities; (vii) material violation of the policies and procedures of the Company Group or any member of thereof applicable to the Executive; (viii) embezzlement and/or misappropriation of property of the Company Group or any member thereof; or (ix) conduct involving any immoral acts which is reasonably likely to impair the reputation of the Company Group or any member thereof.

(b) "Code" shall mean the Internal Revenue Code of 1986, as amended.

(c) "Disability" shall mean the permanent and total disability of the Executive as determined for purposes of the Company Group long-term disability plan in which the Executive participates (or in which the Executive is eligible to participate) at the time the determination is to be made.

(d) "Good Reason" shall mean any of the following that occur without the Executive's written consent upon or following a Transaction: (i) a material diminishment in the Executive's status, position, duties or responsibilities with the Company Group from those in effect immediately prior to the Transaction (or failure to attain a previously announced enhanced role for such executive following the Separation, if applicable); (ii) a material reduction in the Executive's then current annual cash compensation from the Company Group (or a successor, if applicable) below the sum of (A) the Executive's annual base salary or annual base compensation from the Company Group in effect immediately prior to the Transaction and (B) the Executive's targeted annual long-term incentive award for the calendar year completed immediately prior to the Transaction; provided, however, that a material reduction for purposes of this clause (ii) shall not be deemed to have occurred if the Executive's then current annual cash compensation is reduced as part of an overall cost reduction program that affects all senior executives of the business unit in which, or by which, the Executive is employed and does not disproportionately affect the Executive; (iii) relocation of the Executive's principal place of employment by more than fifty (50) miles from his or her principal place of employment in effect immediately prior to the Transaction; or (iv) a material breach of this Agreement by Tenneco or a successor hereto. The Executive's Termination Date shall not be considered to have terminated for Good Reason unless the Executive gives written notice to Tenneco (or, following a Transaction, his or her employer) of the occurrence of an event constituting Good Reason, the Good Reason event is not cured within thirty (30) days following the date on which the notice is received from the Executive, and the Executive terminates his or her employment within fifteen (15) days after expiration of the cure period.

(e) "Payment Date" shall means, with respect to the Retention Bonus or any portion thereof, the date that is sixty (60) days after the applicable Vesting Date relating to the Retention Bonus (or such portion) and in no event later than two and one-half (2-1/2) months following the end of the year in which the applicable Vesting Date occurs.

(f) "Qualifying Termination" occurs if the Executive's Termination Date occurs coincident with or following a Transaction as a result of (i) termination by the Company Group without Cause or (ii) termination by the Executive for Good Reason.

(g) "Termination Date" shall mean the date on which the Executive's employment with the Company Group terminates for any reason; provided, however, that in connection with a Transaction, the Executive's Termination Date shall be considered to have terminated only if his or her employment with the Company Group and any successors (and affiliates of successors) terminates upon or following the Transaction. Subject to the foregoing, the determination as to whether the Executive has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

(h) "Transaction" shall mean the consummation of the separation of the Company Group's businesses into two separate companies consisting of an Aftermarket and Ride Performance company and a Clean Air and Powertrain company (whether effected through a merger, exchange, sale of stock or assets or other transaction).

2. Award of Retention Bonus. Subject to the terms and conditions set forth herein, the Executive shall be entitled to receive a cash payment in an amount equal to $500,000 (the "Retention Bonus"). The member of the Company Group that is the employer of the Executive on the applicable Payment Date shall be responsible for the payment of the Retention Bonus.

3. Vesting of Retention Bonus. The Executive's right to the Retention Bonus shall vest in accordance with the following, as applicable:

(a) In the event that a Transaction occurs on or prior to December 31, 2020, one third (1/3) of the Retention Bonus will vest on the closing of the Transaction, one third (1/3) of the Retention Bonus will vest on December 31, 2020 and 1/3 will vest on December 31, 2021 (each such date a "Vesting Date"), provided that the Executive's Termination Date has not occurred as of the applicable Vesting Date.

(b) In the event that a Transaction does not occur on or prior to December 31, 2020, fifty percent (50%) of the Retention Bonus will vest on December 31, 2020 and fifty percent (50%) of the Retention Bonus will vest on December 31, 2021 (each such date a "Vesting Date"), provided that the Executive's Termination Date has not occurred as of the applicable Vesting Date.

(c) Notwithstanding the provisions of paragraphs (a) and (b), in the event that the Executive's Termination Date occurs as a result of death, Disability, or as a result of termination by the Company Group without Cause, any portion of the Retention Bonus that is not yet vested as of the Termination Date shall become vested on the Executive's Termination Date and the Termination Date shall be the "Vesting Date" with respect to such portions of the Retention Bonus that become vested on the Termination Date.

(d) Notwithstanding the provisions of paragraphs (a) and (b), in the event that a Transaction occurs prior to a Vesting Date and if the Executive's Termination Date occurs coincident with or after the Transaction and prior to a Vesting Date as a result of a Qualifying Termination, any portion of the Retention Bonus that is not yet vested as of the Termination Date shall become vested on the Executive's Termination Date and the Termination Date shall be the "Vesting Date" with respect to such portions of the Retention Bonus that become vested on the Termination Date.

Except as otherwise expressly provided herein, in the event the Executive's Termination Date occurs for any reason (or no reason) prior to a Vesting Date, the Executive shall forfeit all rights to receive any portion Retention Bonus hereunder for which the Vesting Date has not occurred as of the Termination Date.

4. Payment of Retention Bonus. Subject to the terms and conditions of this Agreement, the Retention Bonus (or portion thereof) that becomes vested in accordance with Section 3 hereof shall be paid, in cash, upon the Payment Date.

5. Tax Withholding. Payment of the Retention Bonus hereunder shall be subject to all applicable income and employment taxes and any other amounts that are required by law to be withheld or deducted therefrom.

6. Unfunded Arrangement. The Retention Bonus hereunder shall not be deemed to create a trust or other funded arrangement. The Executive's rights with respect to the Retention Bonus shall be those of a general unsecured creditor of the Company Group, and under no circumstances shall the Executive have any other interest in any assets of any member of the Company Group by virtue of the award of the Retention Bonus.

7. No Right to Continued Employment. The Executive acknowledges and agrees that the Executive's employment with the Company Group is and shall remain "at-will" and the Executive's employment within the Company Group may be terminated at any time and for any reason (or no reason) by the Executive or the Company Group, with or without notice. Nothing in this Agreement shall confer upon the Executive any right to continued employment with the Company Group (or their respective successors) or to interfere in any way with the right of any member of the Company Group (or their respective successors) to terminate the Executive's employment at any time.

8. Other Benefits. The Retention Bonus is a special incentive payment to the Executive and shall not be taken into account in computing the amount of salary or compensation for purposes of determining any bonus, incentive, pension, retirement, death or other benefit under any other bonus, incentive pension, retirement, insurance or other employee benefit plan of the Company, unless such plan or agreement expressly provides otherwise. The Retention Bonus is an additional incentive payment to the Executive and neither this Agreement nor payment of the Retention Bonus shall supersede or replace any other benefits or payments to which the Executive is or may become entitled under any other benefit plan, program, policy or arrangement of the Company or any of its affiliates.

9. Section 409A Compliance. It is intended that any amounts payable under this Agreement shall either be exempt from or comply with section 409A of the Code. The provisions of this Agreement shall be construed and interpreted in accordance with section 409A of the Code. Notwithstanding any other provision of this Agreement to the contrary, if any payment hereunder is subject to section 409A of the Code, and if such payment is to be paid on account of the Executive's termination of employment (or other separation from service) and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment is required to be made prior to the first day of the seventh month following the Participant's separation from service or termination of employment, such payment shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service (or, if earlier, upon his or her death). In no event shall Tenneco or any other member of the Company Group be liable for any additional tax, interest, or penalties that may be imposed on the Executive as a result of section 409A of the Code.

10. Governing Law. This Agreement and any claim, controversy or dispute arising under or related to this Agreement or the relationship of the parties shall be governed by and construed in accordance the laws of the States of Illinois; without giving effect to any choice of law or conflict of law rules or provisions.

11. Severability. The provisions of this Agreement shall be deemed severable. The invalidity or unenforceability of any provision of this Agreement in any jurisdiction shall not affect the validity, legality or enforceability of the remainder of this Agreement in such jurisdiction or the validity, legality or enforceability of any provision of this Agreement in any other jurisdiction, it being intended that all rights and obligations of the parties hereunder shall be enforceable to the fullest extent permitted by applicable law.

12. Assignment; Successors. This Agreement is intended to bind and inure to the benefit of and be enforceable by the Executive, Tenneco and the other members of the Company Group and their respective heirs, successors and assigns. The Executive may not assign his or her rights or delegate his duties or obligations hereunder without the prior written consent of Tenneco. Tenneco or any other member of the Company Group may assign its rights and obligations hereunder, without the consent of, or notice to, the Executive, to (a) any of other member of the , or (b) to any person or entity that acquires a member of the Company Group or

any portion of its business or its assets, in which case references to Tenneco or an applicable member of the Company Group will refer to such assignee.

13. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original but all of which together shall constitute one and the same instrument.

14. No Obligation; Company Discretion. No provision of this Agreement shall be interpreted to impose an obligation on Tenneco or any other member of the Company Group to accept, agree to or otherwise consummate a Transaction. The decision to consummate a Transaction, and all terms and conditions of such transaction, including the amount, timing and form of consideration to be provided in connection therewith, shall be within the sole and absolute discretion of Tenneco.

15. Entire Agreement; Amendment. This Agreement constitutes the entire agreement by the Executive and the Company with respect to the subject matter hereof, and supersedes any and all prior agreements or understandings between the Executive and the Company with respect to the subject matter hereof, whether written or oral. This Agreement may be amended or modified only by a written instrument executed by the Executive and the Company.

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IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first written above.

/s/ Peng Guo

Executive

TENNECO INC.

By: /s/ Roger J. Wood

Name: Roger J. Wood

Title: Co-Chief Executive Officer

Signature Page to Cash Retention Agreement

EXHIBIT 10.56

CASH RETENTION AGREEMENT

This **CASH RETENTION AGREEMENT** (this "Agreement"), dated as of October 28, 2019 (the "Effective Date"), is by and between Tenneco Inc. ("Tenneco" together with its subsidiaries and affiliates, the "Company Group"), and Jason M. Hollar (the "Executive").

WHEREAS, Tenneco has announced that it plans to separate its businesses into an Aftermarket and Ride Performance company and a Clean Air and Powertrain company during 2020 (the "Separation");

WHEREAS, the Executive has been involved in the transition process relating to Tenneco's acquisition of Federal Mogul LLC and the subsequent endeavors leading to the separation of Tenneco's businesses into two separate companies

WHEREAS, the continued services of the Executive are critical to Tenneco's strategy relating to separation of its businesses; and

WHEREAS, to incentivize the Executive to remain employed by the Company Group through such separation and for a period thereafter, Tenneco desires to enter into this Agreement and provide for the compensation specified herein to be paid to the Executive, subject to all of the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the premises and the respective covenants and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto, intending to be legally bound, hereby agree to the following:

1. Definitions. In addition to defined terms included elsewhere in this Agreement, the following capitalized terms when used herein shall have the meaning specified:

(a) "Cause" shall mean the Executive's: (i) willful failure to perform substantially his or her duties (other than any such failure resulting from incapacity due to Disability); (ii) commission of, or indictment for, a felony or any crime involving fraud or embezzlement or dishonesty or conviction of, or plea of guilty or nolo contendere to a crime or misdemeanor (other than a traffic violation) punishable by imprisonment under federal, state or local law; (ii) engagement in an act of fraud or other act of willful dishonesty or misconduct, towards the Company Group or any member thereof, or detrimental to Company Group or any member thereof, or in the performance of the Executive's duties; (iv) negligence in the performance of employment duties that has a materially detrimental effect on the Company Group or any member thereof; (v) violation of a federal or state securities law or regulation; (vi) the use of a controlled substance without a prescription or the use of alcohol which, while performing services on behalf of the Company Group or any member thereof, in each case, significantly impairs the Executive's ability to carry out his or her duties and responsibilities; (vii) material violation of the policies and procedures of the Company Group or any member of thereof applicable to the Executive; (viii) embezzlement and/or misappropriation of property of the Company Group or any member thereof; or (ix) conduct involving any immoral acts which is reasonably likely to impair the reputation of the Company Group or any member thereof.

(b) "Code" shall mean the Internal Revenue Code of 1986, as amended.

(c) "Disability" shall mean the permanent and total disability of the Executive as determined for purposes of the Company Group long-term disability plan in which the Executive participates (or in which the Executive is eligible to participate) at the time the determination is to be made.

(d) "Good Reason" shall mean any of the following that occur without the Executive's written consent upon or following a Transaction: (i) a material diminishment in the Executive's status, position, duties or responsibilities with the Company Group from those in effect immediately prior to the Transaction (or failure to attain a previously announced enhanced role for such executive following the Separation, if applicable); (ii) a material reduction in the Executive's then current annual cash compensation from the Company Group (or a successor, if applicable) below the sum of (A) the Executive's annual base salary or annual base compensation from the Company Group in effect immediately prior to the Transaction and (B) the Executive's targeted annual long-term incentive award for the calendar year completed immediately prior to the Transaction; provided, however, that a material reduction for purposes of this clause (ii) shall not be deemed to have occurred if the Executive's then current annual cash compensation is reduced as part of an overall cost reduction program that affects all senior executives of the business unit in which, or by which, the Executive is employed and does not disproportionately affect the Executive; (iii) relocation of the Executive's principal place of employment by more than fifty (50) miles from his or her principal place of employment in effect immediately prior to the Transaction; or (iv) a material breach of this Agreement by Tenneco or a successor hereto. The Executive's Termination Date shall not be considered to have terminated for Good Reason unless the Executive gives written notice to Tenneco (or, following a Transaction, his or her employer) of the occurrence of an event constituting Good Reason, the Good Reason event is not cured within thirty (30) days following the date on which the notice is received from the Executive, and the Executive terminates his or her employment within fifteen (15) days after expiration of the cure period.

(e) "Payment Date" shall means, with respect to the Retention Bonus or any portion thereof, the date that is sixty (60) days after the applicable Vesting Date relating to the Retention Bonus (or such portion) and in no event later than two and one-half (2-1/2) months following the end of the year in which the applicable Vesting Date occurs.

(f) "Qualifying Termination" occurs if the Executive's Termination Date occurs coincident with or following a Transaction as a result of (i) termination by the Company Group without Cause or (ii) termination by the Executive for Good Reason.

(g) "Termination Date" shall mean the date on which the Executive's employment with the Company Group terminates for any reason; provided, however, that in connection with a Transaction, the Executive's Termination Date shall be considered to have terminated only if his or her employment with the Company Group and any successors (and affiliates of successors) terminates upon or following the Transaction. Subject to the foregoing, the determination as to whether the Executive has had a termination of employment (or separation from service) shall be made in accordance with the provisions of section 409A of the Code and the guidance issued thereunder without application of any alternative levels of reductions of bona fide services permitted thereunder.

(h) "Transaction" shall mean the consummation of the separation of the Company Group's businesses into two separate companies consisting of an Aftermarket and Ride Performance company and a Clean Air and Powertrain company (whether effected through a merger, exchange, sale of stock or assets or other transaction).

2. Award of Retention Bonus. Subject to the terms and conditions set forth herein, the Executive shall be entitled to receive a cash payment in an amount equal to $2,000,000 (the "Retention Bonus"). The member of the Company Group that is the employer of the Executive on the applicable Payment Date shall be responsible for the payment of the Retention Bonus.

3. Vesting of Retention Bonus. The Executive's right to the Retention Bonus shall vest in accordance with the following, as applicable:

(a) In the event that a Transaction occurs on or prior to December 31, 2020, one third (1/3) of the Retention Bonus will vest on the closing of the Transaction, one third (1/3) of the Retention Bonus will vest on December 31, 2020 and 1/3 will vest on December 31, 2021 (each such date a "Vesting Date"), provided that the Executive's Termination Date has not occurred as of the applicable Vesting Date.

(b) In the event that a Transaction does not occur on or prior to December 31, 2020, fifty percent (50%) of the Retention Bonus will vest on December 31, 2020 and fifty percent (50%) of the Retention Bonus will vest on December 31, 2021 (each such date a "Vesting Date"), provided that the Executive's Termination Date has not occurred as of the applicable Vesting Date.

(c) Notwithstanding the provisions of paragraphs (a) and (b), in the event that the Executive's Termination Date occurs as a result of death, Disability, or as a result of termination by the Company Group without Cause, any portion of the Retention Bonus that is not yet vested as of the Termination Date shall become vested on the Executive's Termination Date and the Termination Date shall be the "Vesting Date" with respect to such portions of the Retention Bonus that become vested on the Termination Date.

(d) Notwithstanding the provisions of paragraphs (a) and (b), in the event that a Transaction occurs prior to a Vesting Date and if the Executive's Termination Date occurs coincident with or after the Transaction and prior to a Vesting Date as a result of a Qualifying Termination, any portion of the Retention Bonus that is not yet vested as of the Termination Date shall become vested on the Executive's Termination Date and the Termination Date shall be the "Vesting Date" with respect to such portions of the Retention Bonus that become vested on the Termination Date.

Except as otherwise expressly provided herein, in the event the Executive's Termination Date occurs for any reason (or no reason) prior to a Vesting Date, the Executive shall forfeit all rights to receive any portion Retention Bonus hereunder for which the Vesting Date has not occurred as of the Termination Date.

4. Payment of Retention Bonus. Subject to the terms and conditions of this Agreement, the Retention Bonus (or portion thereof) that becomes vested in accordance with Section 3 hereof shall be paid, in cash, upon the Payment Date.

5. Tax Withholding. Payment of the Retention Bonus hereunder shall be subject to all applicable income and employment taxes and any other amounts that are required by law to be withheld or deducted therefrom.

6. Unfunded Arrangement. The Retention Bonus hereunder shall not be deemed to create a trust or other funded arrangement. The Executive's rights with respect to the Retention Bonus shall be those of a general unsecured creditor of the Company Group, and under no circumstances shall the Executive have any other interest in any assets of any member of the Company Group by virtue of the award of the Retention Bonus.

7. No Right to Continued Employment. The Executive acknowledges and agrees that the Executive's employment with the Company Group is and shall remain "at-will" and the Executive's employment within the Company Group may be terminated at any time and for any reason (or no reason) by the Executive or the Company Group, with or without notice. Nothing in this Agreement shall confer upon the Executive any right to continued employment with the Company Group (or their respective successors) or to interfere in any way with the right of any member of the Company Group (or their respective successors) to terminate the Executive's employment at any time.

8. Other Benefits. The Retention Bonus is a special incentive payment to the Executive and shall not be taken into account in computing the amount of salary or compensation for purposes of determining any bonus, incentive, pension, retirement, death or other benefit under any other bonus, incentive pension, retirement, insurance or other employee benefit plan of the Company, unless such plan or agreement expressly provides otherwise. The Retention Bonus is an additional incentive payment to the Executive and neither this Agreement nor payment of the Retention Bonus shall supersede or replace any other benefits or payments to which the Executive is or may become entitled under any other benefit plan, program, policy or arrangement of the Company or any of its affiliates.

9. Section 409A Compliance. It is intended that any amounts payable under this Agreement shall either be exempt from or comply with section 409A of the Code. The provisions of this Agreement shall be construed and interpreted in accordance with section 409A of the Code. Notwithstanding any other provision of this Agreement to the contrary, if any payment hereunder is subject to section 409A of the Code, and if such payment is to be paid on account of the Executive's termination of employment (or other separation from service) and if the Participant is a specified employee (within the meaning of section 409A(a)(2)(B) of the Code) and if any such payment is required to be made prior to the first day of the seventh month following the Participant's separation from service or termination of employment, such payment shall be delayed until the first day of the seventh month following the Participant's termination of employment or separation from service (or, if earlier, upon his or her death). In no event shall Tenneco or any other member of the Company Group be liable for any additional tax, interest, or penalties that may be imposed on the Executive as a result of section 409A of the Code.

10. Governing Law. This Agreement and any claim, controversy or dispute arising under or related to this Agreement or the relationship of the parties shall be governed by and construed in accordance the laws of the States of Illinois; without giving effect to any choice of law or conflict of law rules or provisions.

11. Severability. The provisions of this Agreement shall be deemed severable. The invalidity or unenforceability of any provision of this Agreement in any jurisdiction shall not affect the validity, legality or enforceability of the remainder of this Agreement in such jurisdiction or the validity, legality or enforceability of any provision of this Agreement in any other jurisdiction, it being intended that all rights and obligations of the parties hereunder shall be enforceable to the fullest extent permitted by applicable law.

12. Assignment; Successors. This Agreement is intended to bind and inure to the benefit of and be enforceable by the Executive, Tenneco and the other members of the Company Group and their respective heirs, successors and assigns. The Executive may not assign his or her rights or delegate his duties or obligations hereunder without the prior written consent of Tenneco. Tenneco or any other member of the Company Group may assign its rights and obligations hereunder, without the consent of, or notice to, the Executive, to (a) any of other member of the , or (b) to any person or entity that acquires a member of the Company Group or

any portion of its business or its assets, in which case references to Tenneco or an applicable member of the Company Group will refer to such assignee.

13. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original but all of which together shall constitute one and the same instrument.

14. No Obligation; Company Discretion. No provision of this Agreement shall be interpreted to impose an obligation on Tenneco or any other member of the Company Group to accept, agree to or otherwise consummate a Transaction. The decision to consummate a Transaction, and all terms and conditions of such transaction, including the amount, timing and form of consideration to be provided in connection therewith, shall be within the sole and absolute discretion of Tenneco.

15. Entire Agreement; Amendment. This Agreement constitutes the entire agreement by the Executive and the Company with respect to the subject matter hereof, and supersedes any and all prior agreements or understandings between the Executive and the Company with respect to the subject matter hereof, whether written or oral. This Agreement may be amended or modified only by a written instrument executed by the Executive and the Company.

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IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first written above.

/s/ Jason Hollar

Executive

TENNECO INC.

By: /s/ Kaled Awada

Name: Kaled Awada
Title: SVP and Chief Human Resources Officer

Signature Page to Cash Retention Agreement

TENNECO INC.

Company Name	Ownership Type (a)	Primary Jurisdiction
A.E. Group Machines Limited	Indirect	United Kingdom
AE International Limited	Indirect	United Kingdom
Anand I-Power Limited	Indirect	India
Anqing TP Goetze Liner Co., Ltd.	Indirect	China
Anqing TP Goetze Piston Ring Co., Ltd.	Indirect	China
Anqing TP Powder Metallurgy Co. Ltd.	Indirect	China
Armstrong Properties (Pty.) Ltd.	Indirect	South Africa
Ateliers Juliette Adam SAS	Indirect	France
Autopartes Walker, S. de R.L. de C.V.	Indirect	Mexico
Beck Arnley Holdings LLC	Indirect	United States
Carter Automotive Company LLC	Indirect	United States
CATAI s.r.l.	Indirect	Italy
CED'S Inc.	Indirect	Illinois
Clevite Industries Inc.	Indirect	Delaware
Componentes Venezolanos de Direccion, S.A.	Indirect	Venezuela
Cooperatief Federal-Mogul Dutch Investments B.A.	Direct	Netherlands
Coventry Assurance Ltd.	Direct	Bermuda
Dongsuh Federal-Mogul Co., Ltd.	Indirect	South Korea
DRiV Automotive Inc.	Indirect	United States
DRiV Incorporated	Direct	United States
DRiV IP LLC	Direct	United States
Farloc Argentina S.A.I.C. y F.	Indirect	Argentina
FDML Holdings Limited	Indirect	United Kingdom
Federal Mogul (Thailand) Ltd.	Indirect	Thailand
Federal Mogul Aftermarket Egypt Ltd.	Indirect	Egypt

Company Name	Ownership Type (a)	Primary Jurisdiction
Federal Mogul Argentina S.A.	Indirect	Argentina
Federal Mogul Dis Ticaret Anonim Sirketi	Indirect	Turkey
Federal Mogul Hungary Kft.	Indirect	Hungary
Federal Mogul Powertrain Otomotiv Anonim Sirketi	Indirect	Turkey
Federal Mogul SAS	Indirect	France
Federal Mogul Services Sarl	Indirect	France
Federal Mogul Systems Protection SAS	Indirect	France
Federal-Mogul (Anqing) Powder Metallurgy Co., Ltd.	Indirect	China
Federal-Mogul (Changshu) Automotive Parts Co., Ltd.	Indirect	China
Federal-Mogul (China) Co., Ltd.	Indirect	China
Federal-Mogul (Chongqing) Friction Materials Co., Ltd.	Indirect	China
Federal-Mogul (Dalian) Co., Ltd.	Indirect	China
Federal-Mogul (Langfang) Automotive Components Co., Ltd.	Indirect	China
Federal-Mogul (Proprietary) Limited	Indirect	South Africa
Federal-Mogul (Shanghai) Automotive Parts Co., Ltd.	Indirect	China
Federal-Mogul (T&N) Hong Kong Limited	Indirect	Hong Kong
Federal-Mogul (Tianjin) Surface Treatment Co., Ltd.	Indirect	China
Federal-Mogul (Vietnam) Ltd.	Indirect	Vietnam
Federal-Mogul Aftermarket Espana, S.A.	Indirect	Spain
Federal-Mogul Aftermarket France SAS	Indirect	France
Federal-Mogul Aftermarket GmbH	Indirect	Germany
Federal-Mogul Aftermarket Southern Africa (Pty) Limited	Indirect	South Africa
Federal-Mogul Aftermarket UK Limited	Indirect	United Kingdom
Federal-Mogul Anand Bearings India Limited	Direct	India
Federal-Mogul Anand Sealings India Limited	Indirect	India
Federal-Mogul Asia Investments Holding Korea, Ltd.	Indirect	South Korea

Company Name	Ownership Type (a)	Primary Jurisdiction
Federal-Mogul Asia Investments Limited	Indirect	United Kingdom
Federal-Mogul Automotive GmbH & Co. KG	Indirect	Germany
Federal-Mogul Automotive Pty Ltd	Indirect	Australia
Federal-Mogul Automotive Verwaltungs GmbH	Direct	Germany
Federal-Mogul Betriebsgrundstucke Burscheid GmbH	Indirect	Germany
Federal-Mogul Bimet Spolka Akcyjna	Indirect	Poland
Federal-Mogul Bradford Limited	Indirect	United Kingdom
Federal-Mogul Bremsbelag GmbH	Indirect	Germany
Federal-Mogul Burscheid Beteiligungs GmbH	Indirect	Germany
Federal-Mogul Burscheid GmbH	Indirect	Germany
Federal-Mogul Canada Limited	Direct	Canada
Federal-Mogul Chassis LLC	Indirect	United States
Federal-Mogul Componentes de Motores Ltda.	Indirect	Brazil .
Federal-Mogul Controlled Power Limited	Indirect	United Kingdom
Federal-Mogul Coventry Limited	Indirect	United Kingdom
Federal-Mogul de Costa Rica, S.A.	Direct	Costa Rica
Federal-Mogul de Guatemala, Sociedad Anonima	Direct	Guatemala
Federal-Mogul de Matamoros, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul de Mexico, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul de Venezuela, C.A.	Indirect	Venezuela
Federal-Mogul Deva (Qingdao) Automotive Parts Co., Ltd.	Indirect	China
Federal-Mogul Deva GmbH	Indirect	Germany
Federal-Mogul Dimitrovgrad LLC	Indirect	Russia
Federal-Mogul Distribucion de Mexico, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Dong Feng (Shiyan) Engine Components Co., Ltd.	Indirect	China
Federal-Mogul EMEA Distribution Services	Indirect	Belgium
Federal-Mogul Employee Trust Administration Limited	Indirect	United Kingdom

Company Name	Ownership Type (a)	Primary Jurisdiction
Federal-Mogul Engineering Limited	Indirect	United Kingdom
Federal-Mogul FIL-P43, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul FIL-S43, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Filtration LLC	Indirect	United States
Federal-Mogul Finance 1, LLC	Indirect	United States
Federal-Mogul Finance 2, LLC	Indirect	United States
Federal-Mogul Financial Services Poland Sp.z.o.o.	Indirect	Poland
Federal-Mogul Financial Services S.A.S.	Indirect	France
Federal-Mogul Financing Corporation	Direct	United States
Federal-Mogul Friction Products a.s.	Indirect	Czech Republic
Federal-Mogul Friction Products Barcelona, S.L.	Indirect	Spain
Federal-Mogul Friction Products Co., Ltd.	Indirect	China
Federal-Mogul Friction Products GmbH	Indirect	Germany
Federal-Mogul Friction Products International GmbH	Indirect	Germany
Federal-Mogul Friction Products Limited	Indirect	United Kingdom
Federal-Mogul Friction Products Ploiesti SRL	Indirect	Romania
Federal-Mogul Friction Products, S.A.	Indirect	Spain
Federal-Mogul Friction Spain, S.L.	Indirect	Spain
Federal-Mogul Friedberg GmbH	Indirect	Germany
Federal-Mogul Garennes SAS	Indirect	France
Federal-Mogul Germany Investments Holding GmbH	Indirect	Germany
Federal-Mogul Global Aftermarket EMEA	Indirect	Belgium
Federal-Mogul Global Growth Limited	Indirect	United Kingdom
Federal-Mogul GmbH	Indirect	Switzerland
Federal-Mogul Goetze (India) Limited	Indirect	India
Federal-Mogul Gorzyce Sp. z o.o.	Indirect	Poland

Company Name	Ownership Type (a)	Primary Jurisdiction
Federal-Mogul Holding Deutschland GmbH	Indirect	Germany
Federal-Mogul Holding Sweden AB	Direct	Sweden
Federal-Mogul Holdings, Ltd.	Indirect	Mauritius
Federal-Mogul Iberica, S.L.	Indirect	Spain
Federal-Mogul Ignition GmbH	Indirect	Germany
Federal-Mogul Ignition LLC	Indirect	United States
Federal-Mogul Ignition Products India Limited	Indirect	India
Federal-Mogul Ignition Products SAS	Indirect	France
Federal-Mogul Industria de Autopecas Ltda.	Indirect	Brazil
Federal-Mogul Investment Ltd.	Indirect	British Virgin Islands
Federal-Mogul Investments B.V.	Indirect	Netherlands
Federal-Mogul Italy S.r.l.	Indirect	Italy
Federal-Mogul Izmit Piston ve Pim Uretim Tesisleri A.S.	Indirect	Turkey
Federal-Mogul Japan K.K.	Indirect	Japan
Federal-Mogul Juarez S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Lighting, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Limited	Indirect	United Kingdom
Federal-Mogul Luxembourg S.a.r.l.	Indirect	Luxembourg
Federal-Mogul Motorparts (India) Limited	Indirect	India
Federal-Mogul Motorparts (Netherlands) B.V.	Direct	Netherlands
Federal-Mogul Motorparts (Pinghu) Trading Limited	Indirect	China
Federal-Mogul Motorparts (Qingdao) Co., Ltd.	Indirect	China
Federal-Mogul Motorparts (Singapore) Pte. Ltd.	Indirect	Singapore
Federal-Mogul Motorparts (Thailand) Limited	Direct	Thailand
Federal-Mogul Motorparts (Zhejiang) Co., Ltd.	Indirect	China
Federal-Mogul Motorparts Colombia S.A.S.	Indirect	Columbia
Federal-Mogul Motorparts Holding B.V.	Indirect	Netherlands

Company Name	Ownership Type (a)	Primary Jurisdiction
Federal-Mogul Motorparts Holding GmbH	Direct	Germany
Federal-Mogul Motorparts LLC	Direct	United States
Federal-Mogul Motorparts Management (Shanghai) Co., Ltd.	Indirect	China
Federal-Mogul Motorparts Minority Holding B.V.	Indirect	Netherlands
Federal-Mogul Motorparts Philippines, Inc.	Indirect	Philippines
Federal-Mogul Motorparts Ploiesti SRL	Indirect	Romania
Federal-Mogul Motorparts Poland Sp.z.o.o.	Indirect	Poland
Federal-Mogul Motorparts Pty Ltd	Indirect	Australia
Federal-Mogul Motorparts Services SRL	Indirect	Romania
Federal-Mogul MP US LLC	Indirect	United States
Federal-Mogul Naberezhnye Chelny	Indirect	Russia
Federal-Mogul Nürnberg GmbH	Indirect	Germany
Federal-Mogul of South Africa (Proprietary) Limited	Indirect	South Africa
Federal-Mogul Operations France S.A.S.	Indirect	France
Federal-Mogul Piston Rings, LLC	Indirect	United States
Federal-Mogul Plasticos Puntanos, S.A.	Indirect	Argentina
Federal-Mogul Powertrain (Netherlands) B.V.	Direct	Netherlands
Federal-Mogul Powertrain Eastern Europe B.V.	Indirect	Netherlands
Federal-Mogul Powertrain IP LLC	Indirect	United States
Federal-Mogul Powertrain Italy S.R.L	Indirect	Italy
Federal-Mogul Powertrain LLC	Direct	United States
Federal-Mogul Powertrain Mexico Distribucion S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Powertrain Russia GmbH	Indirect	Germany
Federal-Mogul Powertrain Solutions India Private Limited	Indirect	India
Federal-Mogul Powertrain Systems S A (Proprietary) Limited	Indirect	South Africa
Federal-Mogul Powertrain Vostok OOO	Indirect	Russia
Federal-Mogul Products US LLC	Indirect	United States

Company Name	Ownership Type (a)	Primary Jurisdiction
Federal-Mogul Pty Ltd	Indirect	Australia
Federal-Mogul R&L Friedberg Casting GmbH & Co. KG	Indirect	Germany
Federal-Mogul Risk Advisory Services LLC	Indirect	United States
Federal-Mogul S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul S.A.	Indirect	Belgium
Federal-Mogul Sealing System (Nanchang) Co., Ltd.	Indirect	China
Federal-Mogul Sealing Systems GmbH	Indirect	Germany
Federal-Mogul Sejong Co., Ltd	Indirect	Korea
Federal-Mogul Sejong Tech Ltd	Indirect	South Korea
Federal-Mogul Serina Co., Ltd.	Indirect	Thailand
Federal-Mogul Sevierville, LLC	Indirect	United States
Federal-Mogul Shanghai Bearing Co., Ltd.	Indirect	China
Federal-Mogul Shanghai Compound Material Co., Ltd.	Indirect	China
Federal-Mogul Singapore Investments Pte. Ltd.	Indirect	Singapore
Federal-Mogul Sistemas Automotivos Ltda.	Indirect	Brazil
Federal-Mogul Sistemas de Limpadores de Para-Brisas Ltda	Indirect	Brazil
Federal-Mogul Sorocaba-Holding Ltda	Indirect	Brazil
Federal-Mogul SP Mexico, S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Systems Protection Hungary Kft.	Indirect	Hungary
Federal-Mogul Systems Protection Morocco SARL AU	Indirect	Morocco
Federal-Mogul Technology Limited	Indirect	United Kingdom
Federal-Mogul TP Europe GmbH & Co KG	Indirect	Germany
Federal-Mogul TP Liner Europe Otomotiv Ltd. Şti	Indirect	Turkey
Federal-Mogul TP Liners, Inc.	Indirect	United States
Federal-Mogul TP Piston Rings GmbH	Indirect	Germany

Company Name	Ownership Type (a)	Primary Jurisdiction
Federal-Mogul TPR (India) Limited	Indirect	India
Federal-Mogul Transaction LLC	Indirect	United States
Federal-Mogul UK Investments Limited	Indirect	United Kingdom
Federal-Mogul UK Powertrain Limited	Indirect	United Kingdom
Federal-Mogul Valve Train International LLC	Indirect	United States
Federal-Mogul Valve Train S. de R.L. de C.V.	Indirect	Mexico
Federal-Mogul Valvetrain GmbH	Indirect	Germany
Federal-Mogul Valvetrain La Source SAS	Indirect	France
Federal-Mogul Valvetrain Limited	Direct	United Kingdom
Federal-Mogul Valvetrain s.r.o.	Indirect	Czech Republic
Federal-Mogul Valvetrain Schirmeck SAS	Indirect	France
Federal-Mogul VCS Holding B.V.	Indirect	Netherlands
Federal-Mogul VCS, LLC	Indirect	Russia
Federal-Mogul Vermogensverwaltungs GmbH	Indirect	Germany
Federal-Mogul Verwaltungs-und Beteiligungs-GmbH	Indirect	Germany
Federal-Mogul Wiesbaden GmbH	Indirect	Germany
Federal-Mogul World Trade (Asia) Limited	Indirect	Hong Kong
Federal-Mogul World Wide LLC	Indirect	United States
Federal-Mogul Yura (Qingdao) Ignition Co., Ltd.	Indirect	China
Federal-Mogul Zhengsheng (Changsha) Piston Ring Co., Ltd.	Indirect	China
Felt Products MFG. CO. LLC	Indirect	United States
Ferodo America, LLC	Indirect	United States
Ferodo Limited	Indirect	United Kingdom
F-M Holding Daros AB	Indirect	Sweden
F-M Holding Goteborg AB	Indirect	Sweden
F-M Holding Mexico, S.A. de C.V.	Direct	Mexico

Company Name	Ownership Type (a)	Primary Jurisdiction
FM International, LLC	Indirect	United States
F-M Motorparts Limited	Indirect	United Kingdom
F-M Motorparts TSC LLC	Indirect	United States
FM Participacoes e Investimentos LTDA	Indirect	Brazil
FM PBW Bearings Private Limited	Indirect	India
F-M Trademarks Limited	Indirect	United Kingdom
F-M TSC Real Estate Holdings LLC	Indirect	United States
Fonciere de Liberation	Indirect	France
Forjas y Maquinas, S. de R.L. de C.V.	Indirect	Mexico
Frenos Hidraulicos Automotrices, S.A. de C.V.	Indirect	Mexico
Fric-Rot S.A.I.C.	Indirect	Argentina
Gasket Holdings, LLC	Indirect	United States
Gillet Exhaust Manufacturing Limited	Indirect	United Kingdom
Gillet Pressings Cardiff Limited	Indirect	United Kingdom
Goetze Wohnungsbau GmbH	Indirect	Germany
ISA Installations Steuerungs und Automatislerungs GmbH	Indirect	Germany
J.W. Hartley (Motor Trade) Limited	Indirect	United Kingdom
Jurid do Brasil Sistemas Automotivos Ltda.	Indirect	Brazil
KB Autosys Co., Ltd.	Indirect	Korea
KB Autosys India Private Ltd.	Indirect	India
KB Autosys (Zhangjiagang) Co., Ltd.	Indirect	China
Kinetic Pty. Ltd.	Indirect	Australia
Kontich	Direct	Belgium
Leeds Piston Ring & Engineering Co. Limited	Indirect	United Kingdom
Maco Inversiones S.A.	Indirect	Argentina
McCord Payen de Mexico S. de R.L. de C.V.	Indirect	Mexico

Company Name	Ownership Type (a)	Primary Jurisdiction
McPherson Strut Company LLC	Indirect	Delaware
Monroe Amortisor Imalat Ve Ticaret Anonim Sirketi	Indirect	Turkey
Monroe Australia Pty. Limited	Indirect	Australia
Monroe Czechia s.r.o.	Indirect	Czech Republic
Monroe Holding, S. de R.L. de C.V.	Indirect	Mexico
Monroe Manufacturing (Proprietary) Ltd.	Indirect	South Africa
Monroe Mexico, S. de R.L. de C.V.	Indirect	Mexico
Monroe Packaging BVBA	Indirect	Belgium
Monroe Ride Performance Sweden AB	Indirect	Sweden
Monroe Springs (Australia) Pty. Ltd.	Indirect	Australia
Montagewerk Abgastechnik Emden GmbH	Indirect	Germany
Motocare India Private Limited	Indirect	India
Muzzy-Lyon Auto Parts LLC	Indirect	United States
Parts Zone (Thailand) Co., Ltd.	Indirect	Thailand
Payen International Limited	Indirect	United Kingdom
Piston Rings (UK) Limited	Indirect	United Kingdom
Precision Modular Assembly Corp.	Indirect	Delaware
Productos de Frenos Automotrices de Calidad S.A. de C.V.	Indirect	Mexico
Proveedora Walker S. de R.L. de C.V.	Indirect	Mexico
Pullman Standard Inc.	Indirect	Delaware
Qingdao Tenneco FAWSN Automobile Parts Co., Ltd.	Indirect	China
Raimsa, S. de R.L. de C.V.	Indirect	Mexico
Ride Performance Canada Inc.	Indirect	Canada
Ride Performance Japan Ltd.	Indirect	Japan
Ride Performance Korea Limited	Indirect	Korea

Company Name	Ownership Type (a)	Primary Jurisdiction
Ride Performance Mexico Holding LLC	Indirect	United States
Sapav Marketing Ltd	Indirect	Cyprus
Saxid	Indirect	France
SAXID Limited	Indirect	United Kingdom
Saxid s.r.l.	Indirect	Italy
Servicio de Componentes Automotrices, S. de R.L. de C.V.	Indirect	Mexico
Servicios Administrativos Industriales, S. de R.L. de C.V.	Indirect	Mexico
Shanghai Tenneco Exhaust System Co., Ltd.	Indirect	China
Sibirica Energy Limited	Indirect	Cyprus
Sintration Limited	Indirect	United Kingdom
Speyside Real Estate, LLC	Indirect	United States
Subensambles Internacionales, S. de R.L. de C.V.	Indirect	Mexico
T&N de Mexico S. de R.L. de C.V.	Indirect	Mexico
T&N Industries, LLC	Indirect	United States
TA (Australia) Group Pty. Ltd.	Indirect	Australia
Taiwan Federal-Mogul Motorparts Co., Limited	Indirect	Taiwan
TecCom GmbH	Indirect	Germany
Tenneco (Beijing) Exhaust System Co., Ltd.	Indirect	China
Tenneco (Beijing) Ride Control System Co., Ltd.	Indirect	China
Tenneco (Changzhou) Ride Performance Co., Ltd.	Indirect	China
Tenneco (China) Co., Ltd.	Indirect	China
Tenneco (Dalian) Exhaust System Co. Ltd.	Indirect	China
Tenneco (Guangzhou) Co., Ltd.	Indirect	China
Tenneco (Jingzhou) Ride Performance Co., Ltd.	Indirect	China
Tenneco (Mauritius) Limited	Indirect	Mauritius

Company Name	Ownership Type (a)	Primary Jurisdiction
Tenneco (MSCan) Operations Inc.	Indirect	Canada (BC)
Tenneco (MUSA)	Indirect	California
Tenneco (Suzhou) Co., Ltd.	Indirect	China
Tenneco (Suzhou) Emission System Co., Ltd.	Indirect	China
Tenneco (Suzhou) Ride Control Co., Ltd.	Indirect	China
Tenneco (Tianjin) Ride Performance Co. Ltd.	Indirect	China
Tenneco (TM Asia) Ltd.	Indirect	Taiwan
Tenneco (TM Belgium) BVBA	Indirect	Belgium
Tenneco Asheville Inc.	Indirect	Delaware
Tenneco Asia Inc.	Indirect	Delaware
Tenneco Automotie Nederland B.V.	Indirect	Netherlands
Tenneco Automotive (Thailand) Limited	Indirect	Thailand
Tenneco Automotive Brasil Ltda.	Indirect	Brazil
Tenneco Automotive Deutschland GmbH	Indirect	Germany
Tenneco Automotive Eastern Europe Sp. z.o.o.	Indirect	Poland
Tenneco Automotive Europe BVBA	Indirect	Belgium
Tenneco Automotive Europe Coordination Center BVBA	Indirect	Belgium
Tenneco Automotive Foreign Sales Corporation Limited	Indirect	Jamaica
Tenneco Automotive France S.A.S.	Indirect	France
Tenneco Automotive Holdings South Africa Pty. Limited	Indirect	South Africa
Tenneco Automotive Iberica S.A.	Indirect	Spain
Tenneco Automotive Inc. Nevada	Direct	Nevada
Tenneco Automotive India Private Limited	Indirect	India
Tenneco Automotive Italia S.r.l.	Indirect	Italy
Tenneco Automotive Operating Company Inc.	Direct	Delaware
Tenneco Automotive Polska Sp. z.o.o.	Indirect	Poland

Company Name	Ownership Type (a)	Primary Jurisdiction
Tenneco Automotive Port Elizabeth (Proprietary) Limited	Indirect	South Africa
Tenneco Automotive Portugal – Componentes Para Automovel, Unipessoal, LDA.	Indirect	Portugal
Tenneco Automotive RSA Company	Indirect	Delaware
Tenneco Automotive Second RSA Company	Indirect	Delaware
Tenneco Automotive Services Societe Par Actions Simplifiee	Indirect	France
Tenneco Automotive Servicios Mexico, S. de R.L. de C.V.	Indirect	Mexico
Tenneco Automotive Trading Company	Indirect	Delaware
Tenneco Automotive UK Limited	Indirect	United Kingdom
Tenneco Automotive Volga LLC	Indirect	Russia
Tenneco Automotive Walker Inc.	Indirect	Delaware
Tenneco Brake, Inc.	Indirect	Delaware
Tenneco CA Czech Republic s.r.o.	Indirect	Czech Republic
Tenneco CA Mexico, S. de R.L. de C.V.	Indirect	Mexico
Tenneco CA Netherlands BV	Indirect	Netherlands
Tenneco Canada Inc.	Indirect	Canada
Tenneco Clean Air Argentina S.A.I.C.	Indirect	Argentina
Tenneco Clean Air India Private Limited	Indirect	India
Tenneco Clean Air Spain, S.L.U.	Indirect	Spain
Tenneco Clean Air US Inc.	Indirect	United States
Tenneco Deutschland Holdinggesellschaft mbH	Indirect	Germany
Tenneco Eastern European Holdings S.a.r.l.	Indirect	Luxembourg
Tenneco Eberspaecher (Beijing) Exhaust System Co., Ltd.	Indirect	China
Tenneco Emission Control (Pty) Ltd	Indirect	South Africa
Tenneco Etain Societe Par Actions Simplifiee	Indirect	France
Tenneco Europe Limited	Indirect	Delaware

Company Name	Ownership Type (a)	Primary Jurisdiction
Tenneco FAWSN (Changchun) Automobile Parts Co., Ltd.	Indirect	China
Tenneco FAWSN (Foshan) Automobile Parts Co., Ltd.	Indirect	China
Tenneco FAWSN (Tianjin) Automobile Parts Co., Ltd.	Indirect	China
Tenneco Fusheng (Chengdu) Automobile Parts Co., Ltd.	Indirect	China
Tenneco Global Holdings Inc.	Indirect	Delaware
Tenneco GmbH	Indirect	Germany
Tenneco Holdings Danmark ApS	Indirect	Denmark
Tenneco Hong Kong Holdings Limited	Indirect	Hong Kong
Tenneco Hungary Korlatolt Felelossegu Tarsasag	Indirect	Hungary
Tenneco Indústria de Autopeças Ltda.	Indirect	Brazil
Tenneco Innovacion S.L.	Indirect	Spain
Tenneco International Holding Corp.	Indirect	Delaware
Tenneco International Luxembourg S.a.r.l.	Indirect	Luxembourg
Tenneco International Manufacturing S.a.r.l.	Indirect	Luxembourg
Tenneco Japan Ltd.	Indirect	Japan
Tenneco Korea Limited	Indirect	Korea
Tenneco Lingchuan (Chongqing) Exhaust System Co., Ltd.	Indirect	China
Tenneco Management (Europe) Limited	Indirect	United Kingdom
Tenneco Mauritius China Holdings Ltd.	Indirect	Mauritius
Tenneco Mauritius Holdings Limited	Indirect	Mauritius
Tenneco Mexico, S. de R.L. de C.V.	Indirect	Mexico
Tenneco Ride Control South Africa (Pty) Ltd.	Indirect	South Africa
Tenneco Ride Performance US 4 LLC	Indirect	United States
Tenneco Ride Performance US 5 LLC	Indirect	United States
Tenneco RP Germany GmbH	Indirect	Germany

Company Name	Ownership Type (a)	Primary Jurisdiction
Tenneco Silesia spolka z ograniczona odpowiedzialnoscia	Indirect	Poland
Tenneco SpinCo Incorporated	Direct	United States
Tenneco Sverige AB	Indirect	Sweden
Tenneco Walker (Tianjin) Exhaust System Co., Ltd.	Indirect	China
Tenneco Zwickau GmbH	Indirect	Germany
Tenneco-Eberspaecher (Dalian) Exhaust System Co., Ltd.	Indirect	China
Tenneco-Walker (U.K.) Limited	Indirect	United Kingdom
The Pullman Company	Indirect	Delaware
The Tenneco Automotive (UK) Pension Scheme Trustee Limited	Indirect	United Kingdom
Thompson and Stammers (Dunmow) Number 6 Limited	Indirect	United Kingdom
Thompson and Stammers (Dunmow) Number 7 Limited	Indirect	United Kingdom
TM S.r.l. in liquidation	Indirect	Italy
TMC Texas Inc.	Indirect	Delaware
TPR Federal-Mogul Tennessee, Inc.	Indirect	United States
United Piston Ring, Inc.	Indirect	United States
VTD Vakuumtechnik Dresden GmbH	Indirect	Germany
Walker Australia Pty. Limited	Indirect	Australia
Walker Danmark ApS	Indirect	Denmark
Walker Electronic Silencing, Inc.	Indirect	Delaware
Walker Europe, Inc.	Indirect	Delaware
Walker Exhaust (Thailand) Company Limited	Indirect	Thailand
Walker Gillet (Europe) GmbH	Indirect	Germany
Walker Limited	Indirect	United Kingdom
Walker Manufacturing Company	Indirect	Delaware
Walker UK Ltd	Indirect	United Kingdom
Wellworthy Limited	Indirect	United Kingdom

Company Name	Ownership Type (a)	Primary Jurisdiction
Wimetal Societe Par Actions Simplifiee	Indirect	France
Wuhan Tenneco Exhaust System Co., Ltd.	Indirect	China
Yura Federal Mogul Sejong Ignition Limited Liability Company	Indirect	South Korea

(a) Ownership type indicates whether each subsidiary or affiliate is directly owned by Tenneco Inc., indirectly owned by a subsidiary of Tenneco Inc. (in each case, such subsidiary or affiliate may be partially or wholly owned), or a combination thereof.

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-17485, 333-41535, 333-33934, 333-101973, 333-113705, 333-142475, 333-159358, 333-192928, 333-227648, and 333-230532) and the Registration Statements on Form S-3 (Nos. 333-224786 and 333-227646) of Tenneco Inc. of our report dated March 2, 2020 relating to the financial statements and financial statement schedule and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

Milwaukee, Wisconsin
March 2, 2020

Exhibit 24

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ Brian J. Kesseler

Name: Brian J. Kesseler

Exhibit 24.2

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ Jason M. Hollar

Name: Jason M. Hollar

Exhibit 24.3

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ John S. Patouhas

Name: John S. Patouhas

Exhibit 24.4

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ Gregg M. Sherrill

Name: Gregg M. Sherrill

Exhibit 24.5

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ SungHwan Cho

Name: SungHwan Cho

Exhibit 24.6

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ Thomas C. Freyman

Name: Thomas C. Freyman

Exhibit 24.7

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ Denise Gray

Name: Denise Gray

Exhibit 24.8

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ Dennis J. Letham

Name: Dennis J. Letham

Exhibit 24.9

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ Roger B. Porter

Name: Roger B. Porter

Exhibit 24.10

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ James S. Metcalf

Name: James S. Metcalf

Exhibit 24.11

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ David B. Price, Jr.

Name: David B. Price, Jr.

Exhibit 24.12

TENNECO INC.
POWER OF ATTORNEY

The undersigned does hereby appoint Brandon B. Smith and Jason M. Hollar, and each of them, with full power to act alone, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to execute the Annual Report on Form 10-K for the year ended December 31, 2019 of Tenneco Inc., including any and all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any one of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

IN TESTIMONY WHEREOF, the undersigned has executed this instrument this 21st day of February, 2020.

/s/ Jane L. Warner

Name: Jane L. Warner

EXHIBIT 31.1

CERTIFICATION PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT

I, Brian J. Kesseler, certify that:

1. I have reviewed this annual report on Form 10-K of Tenneco Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of the registrant's internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
    b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ BRIAN J. KESSELER

Brian J. Kesseler

Chief Executive Officer

Dated: March 2, 2020

EXHIBIT 31.2

CERTIFICATION PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT

I, Jason M. Hollar, certify that:

1. I have reviewed this annual report on Form 10-K of Tenneco Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of the registrant's internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ JASON M. HOLLAR

Jason M. Hollar

Executive Vice President and Chief Financial Officer

Dated: March 2, 2020

EXHIBIT 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the accompanying Annual Report on Form 10-K of Tenneco Inc. (the "Company") for the period ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), and pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, Brian J. Kesseler, as Chief Executive Officer of the Company and Jason M. Hollar, as Chief Financial Officer of the Company, hereby certify that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ BRIAN J. KESSELER

Brian J. Kesseler
Chief Executive Officer

/s/ JASON M. HOLLAR

Jason M. Hollar
Executive Vice President and Chief Financial Officer

March 2, 2020

This certification shall not be deemed "filed" by the Company for purposes of Section 18 of the Securities Exchange Act of 1934. In addition, this certification shall not be deemed to be incorporated by reference into any filing under the Securities Exchange Act of 1933 or the Securities Exchange Act of 1934.

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.