

Registered number: 12784440

LIBERTY GLOBAL SSC LIMITED

ANNUAL REPORT AND FINANCIAL STATEMENTS FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

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LIBERTY GLOBAL SSC LIMITED

COMPANY INFORMATION

Directors	J L Evans N M Marchant
Registered number	12784440
Registered office	Griffin House 161 Hammersmith Road London W6 8BS
Independent auditor	KPMG LLP 1 St Peter's Square Manchester M2 3AE

LIBERTY GLOBAL SSC LIMITED

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LIBERTY GLOBAL SSC LIMITED

STRATEGIC REPORT FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

Principal activities and business review

The company was incorporated on 31 July 2020.

The principal activity of Liberty Global SSC Limited (the "company") during the period was, and will continue to be, the provision of corporate services to fellow subsidiaries and affiliates of Liberty Global plc.

At 31 December 2021 the company was a wholly-owned subsidiary of Liberty Global plc.

Liberty Global plc group ("Liberty Global" or the "group") is an international provider of broadband internet, video, fixed-line telephony and mobile communications services to residential customers and businesses in Europe. Liberty Global's continuing operations comprise businesses that provide residential and business-to-business (B2B) communications services in (i) Switzerland and Slovakia through certain wholly-owned subsidiaries that the group collectively refer to as "UPC Holding", (ii) Belgium through Telenet Group Holding N.V. (Telenet), a 60.8%-owned subsidiary, and (iii) Ireland through another wholly-owned subsidiary (VM Ireland). In addition, the group own 50% noncontrolling interests in (a) a 50:50 joint venture with Vodafone Group plc (Vodafone) (the VodafoneZiggo JV), which provides residential and B2B communication services in the Netherlands, and (b) a 50:50 joint venture with Telefónica SA (Telefónica) (the VMO2 JV), which provides residential and B2B communication services in the United Kingdom (UK). In addition, Liberty Global's global investment arm has investments in more than 75 companies and funds in the fields of content, technology, and infrastructure, including strategic stakes in companies such as Plume Design, Inc., ITV plc, Lions Gate Entertainment Corp, Univision Holdings Inc., the Formula E racing series and several regional sports networks.

At 31 December 2021 Liberty Global deliver market-leading products through next-generation networks that connect retail and wholesale customers subscribing to over 85 million broadband internet, video, fixed-line telephony and mobile services across Liberty Global's brands.

Principal risks and uncertainties

Financial and operational risk management is undertaken as part of the group operations as a whole. The company's operations expose it to a variety of operational and financial risks. These are considered in more detail in the 2021 Liberty Global Annual Report which is available at www.libertyglobal.com, or from the company secretary, Liberty Global plc, Griffin House, 161 Hammersmith Road, London, UK, W6 8BS.

COVID-19

The global COVID-19 pandemic continues to impact the economies of the countries in which Liberty Global operate. However, during the period ended 31 December 2021, the impact on the group continued to be relatively minimal as demand for Liberty Global's products and services remained strong. It is not currently possible to estimate the duration and severity of the COVID-19 pandemic or the adverse economic impact resulting from the preventative measures taken to contain or mitigate its outbreak, therefore no assurance can be given that an extended period of global economic disruption would not have a material adverse impact on the group's business, financial condition and results of operations in future periods.

Key performance indicators (KPIs)

Revenue for the period ended 31 December 2021 was £34,580,000 and was generated from services provided to the fellow subsidiaries and affiliates of Liberty Global plc.

Administrative expenses totalled £32,910,000 in the period ended 31 December 2021, primarily related to employee costs.

Operating profit was £1,670,000 in the period ended 31 December 2021.

Future outlook

The directors will continue to review management policies in light of changing trading and market conditions. Further detail of the future outlook of the group is provided in the 2021 Liberty Global Annual Report which is available at www.libertyglobal.com.

LIBERTY GLOBAL SSC LIMITED

STRATEGIC REPORT (CONTINUED) FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

Section 172 Statement

This statement is intended to disclose how our directors have approached and met their responsibilities under s172 Companies Act 2006.

In line with the group's goal of enhancing the long-term value for the benefit of its shareholder, the directors of the company have been elected by our shareholder to oversee the management of the company, to help assure that the interests of our shareholder are served.

The following factors are considered as part of group operations as a whole, to maintain highest standards of corporate governance, essential to our business integrity and performance:

- long-term consequences of decisions;
- employees' interests;
- business relationships with suppliers and customers;
- the impact of our operations on the environment and communities in which we operate and;
- the need to act fairly between shareholders.

Consideration of these factors and other relevant matters is embedded into all Liberty Global group decision-making, strategy development and risk assessment throughout the year. Further information is considered in more detail in the 2021 Liberty Global Annual Report which is available at www.libertyglobal.com.

This report was approved by the board on 20 April 2022 and signed on its behalf.



N M Marchant
Director

LIBERTY GLOBAL SSC LIMITED

DIRECTORS' REPORT FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

The directors present their report and audited financial statements of the company for the period ended 31 December 2021.

Results and dividends

The profit for the period, after tax, amounted to £1,260,000.

The directors have not recommended an ordinary dividend.

Directors

The directors who served during the period and thereafter were:

C H R Bracken (appointed 31 July 2020, resigned 2 December 2020)

J L Evans (appointed 31 July 2020)

N M Marchant (appointed 2 December 2020)

The directors of the company have been indemnified against liability in respect of proceedings brought by third parties, subject to the conditions set out in the Companies Act 2006. Such qualifying third party indemnity provision is in force for directors serving during the financial period and as at the date of approving the Directors' report.

Employment policies and disabled employees

Liberty Global remains committed to the continuing introduction and practice of progressive employment policies which reflect changing business, social and employee needs.

Liberty Global aims to ensure that everyone connected to it is treated fairly and equally, whether they are a current or former member of staff, job applicant, customer or supplier.

Nobody should be discriminated against, either directly or indirectly, on the grounds of their gender, gender reassignment, marital status, pregnancy, race, ethnic origin, colour, nationality, national origin, disability, sexual orientation, religion or belief, age, political affiliation or trade union membership. The policy applies to anyone who works for, who has worked for or who applies to work for Liberty Global or its partners. That means permanent, temporary, casual or part-time staff, anyone on a fixed-term contract, agency staff and consultants working with the group, ex-employees and people applying for jobs. This applies to all aspects of employment, including recruitment and training.

Liberty Global gives full consideration to applications from employees with disabilities where they can adequately fulfil the requirements of the job. Depending on their skills and abilities, employees with a disability have the same opportunities for promotion, career development and training as other employees. Where existing employees become disabled, it is Liberty Global's policy to provide continuing employment wherever practicable in the same or an alternative position and to provide appropriate training to achieve this aim.

In line with Liberty Global's 'Code of Business Conduct', the group's employees and directors are expected to display responsible and ethical behaviour, to follow consistently both the meaning and intent of this Code and to act with integrity in all of the group's business dealings. Managers and supervisors are expected to take such action as is necessary and appropriate to ensure that the group's business processes and practices are in full compliance with the Code.

Employee involvement

Liberty Global is resolved to building a safe, accepting and inclusive culture in the workplace and have been actively involved in similar efforts in our local communities. A diverse and inclusive culture is critical to Liberty Global's performance, reputation and innovation, and it brings us closer to the communities in which we live and operate. Liberty Global seeks to achieve employee involvements in various ways, including the follows:

- Senior leadership communications;
- Further developing of the Diversity, Equity & Inclusion (DE&I) Council that is composed of Liberty Global's CEO, Chief DE&I Office and 19 executive representatives from across the group, including the launch of five Employee Resource Groups (ERGs) focusing on gender, race and ethnicity, multigenerational households, ability and neurodiversity and sexual orientations;
- Measuring quarterly employee engagement against external benchmarks, where survey results are owned by managers and executives, who are accountable for formulating action plans;
- Gathering qualitative and quantitative insights with methods such as short-term pulse surveys and narrower focus groups.

Liberty Global challenges employees to achieve their full potential, become purposeful leaders and to "Grow with Us". Liberty Global commit significant resources and make ongoing investments towards the development of the employees' leadership skills. Liberty Global invests significantly in its employees because it recognises that when each employee is supported and given the opportunity to succeed, the company as a whole flourishes.

Further information on Liberty Global's workforce and Liberty Global's commitment to its employees is made available in the 2021 Liberty Global Annual Report and 2021 Annual Corporate Responsibility Report which is available at www.libertyglobal.com.

LIBERTY GLOBAL SSC LIMITED

**DIRECTORS' REPORT (CONTINUED)
FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021**

Going Concern

After making suitable enquiries, the directors have a reasonable expectation that the company has adequate resources to continue in operational existence for the foreseeable future. Accordingly, they continue to adopt the going concern basis in preparing these financial statements. Consideration of the on-going impact of COVID-19 has not altered this conclusion.

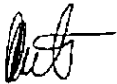
Disclosure of information to the auditor

So far as each person who was a director at the date of approving this report is aware, there is no relevant audit information, being information needed by the auditor in connection with preparing its report, of which the auditor is unaware. Having made enquiries of fellow directors and the company's auditor, each director has taken all the steps that they are obliged to take as a director in order to make themselves aware of any relevant audit information and to establish that the auditor is aware of that information.

Auditors

KPMG LLP will be reappointed under section 489 of the Companies Act 2006.

This report was approved by the board on 20 April 2022 and signed on its behalf.



N M Marchant
Director

LIBERTY GLOBAL SSC LIMITED

DIRECTORS' RESPONSIBILITIES STATEMENT FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

The directors are responsible for preparing the Strategic report, the 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 period. Under that law they have elected to prepare the financial statements in accordance with applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice), including Financial Reporting Standard 101 'Reduced Disclosure Framework'.

Under company law the directors must not approve the financial statements unless 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 these financial statements, the directors are required to:

- select suitable accounting policies and then apply them consistently;
- make judgements and accounting 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;
- assess the Company's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern; and
- use the going concern basis of accounting unless they either intend to liquidate the company or to cease operations, or have no realistic alternative but to do so.

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 responsible for such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error, and have general responsibility for taking such steps as are reasonably open to them to safeguard the assets of the company and to prevent and detect fraud and other irregularities.

The directors are responsible for the maintenance and integrity of the corporate and financial information included on the company's website. Legislation in the UK governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions.

INDEPENDENT AUDITOR'S REPORT TO THE MEMBER OF LIBERTY GLOBAL SSC LIMITED

Opinion

We have audited the financial statements of Liberty Global SSC Limited ("the company") for the 17 month period ended 31 December 2021 which comprise the profit and loss account, balance sheet, statement of changes in equity and related notes, including the accounting policies in note 2.

In our opinion the financial statements:

- give a true and fair view of the state of the company's affairs as at 31 December 2021 and of its profit for the 17 month period then ended;
- have been properly prepared in accordance with UK accounting standards, including FRS 101 *Reduced Disclosure Framework*; 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 are described below. We have fulfilled our ethical responsibilities under, and are independent of the company in accordance with, UK ethical requirements including the FRC Ethical Standard. We believe that the audit evidence we have obtained is a sufficient and appropriate basis for our opinion.

Going concern

The directors have prepared the financial statements on the going concern basis as they do not intend to liquidate the company or to cease its operations, and as they have concluded that the company's financial position means that this is realistic. They have also concluded that there are no material uncertainties that could have cast significant doubt over its ability to continue as a going concern for at least a year from the date of approval of the financial statements ("the going concern period").

In our evaluation of the directors' conclusions, we considered the inherent risks to the company's business model and analysed how those risks might affect the company's financial resources or ability to continue operations over the going concern period.

Our conclusions based on this work:

- we consider that the directors' use of the going concern basis of accounting in the preparation of the financial statements is appropriate;
- we have not identified, and concur with the directors' assessment that there is not, a material uncertainty related to events or conditions that, individually or collectively, may cast significant doubt on the company's ability to continue as a going concern for the going concern period.

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 above conclusions are not a guarantee that the company will continue in operation.

Fraud and breaches of laws and regulations – ability to detect

Identifying and responding to risks of material misstatement due to fraud

To identify risks of material misstatement due to fraud ("fraud risks") we assessed events or conditions that could indicate an incentive or pressure to commit fraud or provide an opportunity to commit fraud. Our risk assessment procedures included:

- Enquiring of directors as to the company's high-level policies and procedures to prevent and detect fraud, including the internal audit function, and the company's channel for "whistleblowing", as well as whether they have knowledge of any actual, suspected or alleged fraud.
- Reading Board minutes.
- Considering remuneration incentive schemes and performance targets for management/directors.

We communicated identified fraud risks throughout the audit team and remained alert to any indications of fraud throughout the audit.

As required by auditing standards, we perform procedures to address the risk of management override of controls, in particular the risk that management may be in a position to make inappropriate accounting entries and the risk of bias in accounting estimates and judgements such as impairment. On this audit we do not believe there is a fraud risk related to revenue recognition because revenue relates to intercompany transactions which are simple in nature, reducing the risk of error. Management's performance is not linked to revenue and the company is not high risk which reduced the risk that management would fraudulently report revenue.

We did not identify any additional fraud risks.

INDEPENDENT AUDITOR'S REPORT TO THE MEMBER OF LIBERTY GLOBAL SSC LIMITED (CONTINUED)

In determining the audit procedures, we took into account the results of our evaluation and testing of the operating effectiveness of the company-wide fraud risk management controls.

We also performed procedures including:

- Identifying journal entries to test based on risk criteria and comparing the identified entries to supporting documentation. These included those posted by individuals who typically do not make journal entries or are not authorised to post journal entries and those posted to unusual/unrelated accounts.

Identifying and responding to risks of material misstatement due to non-compliance with laws and regulations

We identified areas of laws and regulations that could reasonably be expected to have a material effect on the financial statements from our general commercial and sector experience, through discussion with the directors (as required by auditing standards) and from inspection of the company's regulatory and legal correspondence and discussed with the directors and other management the policies and procedures regarding compliance with laws and regulations.

We communicated identified laws and regulations throughout our team and remained alert to any indications of non-compliance throughout the audit.

The potential effect of these laws and regulations on the financial statements varies considerably.

Firstly, the company is subject to laws and regulations that directly affect the financial statements including financial reporting legislation (including related companies legislation), distributable profits legislation and taxation legislation, and we assessed the extent of compliance with these laws and regulations as part of our procedures on the related financial statement items.

Secondly, the company is subject to many other laws and regulations where the consequences of non-compliance could have a material effect on amounts or disclosures in the financial statements, for instance through the imposition of fines or litigation. We identified the following areas as those most likely to have such an effect: health and safety, anti-bribery, employment law, recognising the financial and regulated nature of the company's activities and its legal form. Auditing standards limit the required audit procedures to identify non-compliance with these laws and regulations to enquiry of the directors and other management and inspection of regulatory and legal correspondence, if any. Therefore, if a breach of operational regulations is not disclosed to us or evident from relevant correspondence, an audit will not detect that breach.

Context of the ability of the audit to detect fraud or breaches of law or regulation

Owing to the inherent limitations of an audit, there is an unavoidable risk that we may not have detected some material misstatements in the financial statements, even though we have properly planned and performed our audit in accordance with auditing standards. For example, the further removed non-compliance with laws and regulations is from the events and transactions reflected in the financial statements, the less likely the inherently limited procedures required by auditing standards would identify it.

In addition, as with any audit, there remained a higher risk of non-detection of fraud, as these may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal controls. Our audit procedures are designed to detect material misstatement. We are not responsible for preventing non-compliance or fraud and cannot be expected to detect non-compliance with all laws and regulations.

Strategic report and Directors' report

The directors are responsible for the Strategic report and the Directors' report. Our opinion on the financial statements does not cover those reports and we do not express an audit opinion thereon.

Our responsibility is to read the Strategic report and the Directors' report and, in doing so, consider whether, based on our financial statements audit work, the information therein is materially misstated or inconsistent with the financial statements or our audit knowledge. Based solely on that work:

- we have not identified material misstatements in the Strategic report and the Directors' report.
- in our opinion the information given in those reports for the financial period is consistent with the financial statements; and
- in our opinion those reports have been prepared in accordance with the Companies Act 2006.

INDEPENDENT AUDITOR'S REPORT TO THE MEMBER OF LIBERTY GLOBAL SSC LIMITED (CONTINUED)

Matters on which we are required to report by exception

Under the Companies Act 2006 we are required 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; or
- the directors were not entitled to take advantage of the small companies exemption from the requirement to prepare a Strategic report.

We have nothing to report in these respects.

Directors' responsibilities

As explained more fully in their statement set out on page 5, the directors are responsible for: the preparation of the financial statements and for being satisfied that they give a true and fair view; such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error; 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 they either intend to liquidate the company or to cease operations, or have no realistic alternative but to do so.

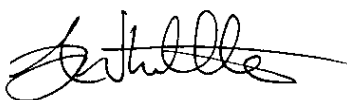
Auditor's responsibilities

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 our opinion in an auditor's report. Reasonable assurance is a high level of assurance, but does not 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 aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

A fuller description of our responsibilities is provided on the FRC's website at www.frc.org.uk/auditorsresponsibilities.

The purpose of our audit work and to whom we owe our responsibilities

This report is made solely to the company's member 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 member 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 member for our audit work, for this report, or for the opinions we have formed.



Antony Whittle (Senior Statutory Auditor)
for and on behalf of KPMG LLP, Statutory Auditor
Chartered Accountants
1 St Peter's Square
Manchester
M2 3AE

26 April 2022

LIBERTY GLOBAL SSC LIMITED

**PROFIT AND LOSS ACCOUNT
FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021**

		Period from 31 July 2020 to 31 December 2021 £000
	Note	
Revenue		34,580
Gross profit		34,580
Administrative expenses		(32,910)
Operating profit	4	1,670
Finance income	6	12
Finance costs	7	(422)
Profit before tax		1,260
Income tax expense	8	-
Profit for the period		1,260

The notes on pages 12 to 23 form part of these financial statements.

There was no other comprehensive income or expenditure for the period other than included in the profit and loss account.

All results were derived from continuing operations.

LIBERTY GLOBAL SSC LIMITED
REGISTERED NUMBER: 12784440

BALANCE SHEET
AS AT 31 DECEMBER 2021

	Note	2021 £000
Fixed assets		
Property, plant and equipment	9	2,748
		<u>2,748</u>
Current assets		
Debtors: amounts falling due after more than one year	10	1,688
Debtors: amounts falling due within one year	10	5,155
		<u>6,843</u>
Creditors: amounts falling due within one year	11	(5,069)
Net current assets		<u>1,774</u>
Total assets less current liabilities		<u>4,522</u>
Creditors: amounts falling due after more than one year	12	(2,741)
Net assets		<u>1,781</u>
Capital and reserves		
Share capital	14	-
Retained earnings	15	1,781
Total shareholder's funds		<u>1,781</u>

The financial statements were approved and authorised for issue by the board and were signed on its behalf on 20 April 2022.



N M Marchant
Director

The notes on pages 12 to 23 form part of these financial statements.

LIBERTY GLOBAL SSC LIMITED

STATEMENT OF CHANGES IN EQUITY
FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

	Share capital	Retained earnings	Total shareholder's funds
	£000	£000	£000
Balance as at 31 July 2020	-	-	-
Comprehensive income for the period			
Profit for the period	-	1,260	1,260
Total comprehensive income for the period	-	1,260	1,260
Issue of share capital (note 14)	-	-	-
Share-based remuneration	-	1,057	1,057
Employee share option recharges from parent undertaking	-	(536)	(536)
Balance as at 31 December 2021	-	1,781	1,781

The notes on pages 12 to 23 form part of these financial statements.

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

1. Company information

Liberty Global SSC Limited (the "company") is a private company incorporated, domiciled and registered in the UK. The registered number is 12784440. The registered address is Griffin House, 161 Hammersmith Road, London, W6 8BS.

2. Accounting policies

A summary of the principal accounting policies is set out below. All accounting policies have been applied consistently, unless noted below.

2.1 Basis of accounting

These financial statements have been prepared on a going concern basis and under the historical cost basis in accordance with the Companies Act 2006 and Financial Reporting Standard 101 Reduced Disclosure Framework ("FRS 101").

In preparing these financial statements, the company applies the recognition, measurement and disclosure requirements of International Accounting Standards in conformity with the requirements of the Companies Act 2006 ("Adopted IFRSs"), but makes amendments where necessary in order to comply with Companies Act 2006 and has set out below where advantage of the FRS 101 disclosure exemptions has been taken.

The financial statements are presented in Sterling ("£") and rounded to the nearest thousand.

The company's ultimate parent undertaking, Liberty Global plc, includes the company in its consolidated financial statements. The consolidated financial statements of Liberty Global plc are prepared in accordance with International Accounting Standards in conformity with the requirements of the Companies Act 2006 and are available to the public and may be obtained from Liberty Global's website at www.libertyglobal.com.

In these financial statements, the company has applied the exemptions available under FRS 101 in respect of the following disclosures:

- a cash flow statement and related notes;
- disclosures in respect of related party transactions with fellow group undertakings;
- disclosures in respect of capital management;
- the effects of new but not yet effective IFRSs;
- disclosures in respect of the compensation of key management personnel;
- disclosures of transactions with a management entity that provides key management personnel services to the company.

As the consolidated financial statements of Liberty Global plc include the equivalent disclosures, the company has also taken the exemptions under FRS 101 available in respect of the following disclosure:

- IFRS 2 share-based payments in respect of group settled share-based payments.

2.2 Going concern

The financial statements have been approved on the assumption that the company will continue to be a going concern.

The going concern assessment of Liberty Global SSC Limited is performed as that of a subsidiary of Liberty Global. It is Liberty Global's practice for operational and financial management to be undertaken at a group level rather than for individual entities that are wholly-owned by the group. As part of normal business practice, regular cash flow forecasts for both short and long term commitments are undertaken at group level.

Forecasts and projections prepared for Liberty Global as a whole group, indicate that cash on hand, together with cash from operations and undrawn revolving credit facilities, are expected to be sufficient for the group's and hence the company's cash requirements through to at least twelve months from the approval of these financial statements.

Whilst the detailed cash flow forecasts are prepared at the group level, the directors have also assessed the position of the company, including the potential requirement for the recoverability of the intercompany loans. This assessment indicates that, taking account of reasonably possible downsides, the company will have sufficient funds, through funding from its fellow subsidiary company, Liberty Global Europe 2 Limited, to meet its liabilities as they fall due for that period. Liberty Global Europe 2 Limited has indicated its intention to continue to make available such funds for at least 12 months from the approval of these financial statements.

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

2. Accounting policies (continued)

2.2 Going concern (continued)

As with any company placing reliance on other group entities for financial support, the directors acknowledge that there can be no certainty that this support will continue although, at the date of approval of these financial statements, they have no reason to believe that it will not do so.

Consequently, the directors are confident that the company will have sufficient funds to continue to meet its liabilities as they fall due for at least 12 months from the date of approval of the financial statements and have prepared the financial statements on a going concern basis. Consideration of the on-going impact of COVID-19 has not altered this conclusion.

2.3 Revenue

Revenue represents the value of corporate services provided to fellow group undertakings and affiliates of Liberty Global plc, stated net of value added tax and discounts, and is attributable to continuing activities. Revenue is recognised over the contracted term, to the extent that is realised or realisable and earned. Revenue is measured at the fair value of the consideration received. All revenue is derived from operations in the United Kingdom for fellow group companies and affiliates in both the United Kingdom and outside. The directors consider this to be a single class of business.

2.4 Finance income and finance costs

Finance income and costs are recognised as interest receivable and payable accrued according to the effective interest rate method, which uses the rate that discounts estimated future cash receipts and pays through the expected life of the financial instrument to the net carrying amount. Foreign currency gain and loss is reported on a net basis in the profit and loss account as part of finance income if a net gain and as part of finance costs if a net loss (see note 2.10 on foreign currencies policy).

2.5 Property, plant and equipment

Depreciation is provided on all property, plant and equipment, other than freehold land, on a straight line basis at rates calculated to write off the cost of each asset over the expected useful economic life as follows:

- | | |
|---------------------------------|-----------------|
| - Property, plant and equipment | 3 years |
| - Construction in progress | Not depreciated |

The carrying values of property, plant and equipment are reviewed for impairment when events or changes in circumstances indicate that the carrying value may not be recoverable. The useful lives and residual values are reviewed annually and where adjustments are required these are made prospectively.

2.6 Employee benefits

Defined contribution pension plan

The company operates a defined contribution plan for its employees. A defined contribution plan is a pension plan under which the company pays fixed contributions into a separate entity. Once the contributions have been paid the company has no further payment obligations.

The contributions are charged to the profit and loss account when they fall due. Amounts not paid are shown in accruals as a liability in the balance sheet.

Short-term employee benefits

When an employee has rendered services to the company during an accounting period, short-term benefits expected to be paid in exchange for those services are recognised in the same accounting period. Cash based long-term incentives are accrued at fair value, recognising the movement in the accrual in the financial statements where the conditions and the plan extend beyond a year.

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

2. Accounting policies (continued)

2.6 Employee benefits (continued)

Share-based payments

The company is an indirect, wholly-owned subsidiary of Liberty Global plc.

Liberty Global provides share-based remuneration to certain key employees within the group, some of which are employed by the company, including performance plans, stock options, stock appreciation rights ("SARS"), restricted stock and restricted stock units together "share-based remuneration".

It is currently Liberty Global's intention to equity settle this share-based remuneration, however the value of amounts exercised by employees of the company pertaining to these awards is recharged by the group to the company.

Share-based remuneration for performance plans is accounted for as a liability-based plan given a variable number of shares will be issued to settle the fixed obligation determined as at the end of the performance period. Share-based remuneration is recognised using the accelerated attribution method based on an assessment of the awards that are probable to be earned and is recorded as share-based remuneration, notwithstanding the fact that Liberty Global could elect at a future date to cash settle all or any portion of vested awards under these plans.

Other share-based remuneration is measured at fair value and recognised as an expense in the profit and loss account. The fair value is measured at the date of grant using option-pricing models, taking into account the terms and conditions upon which awards are granted.

The fair value is recognised over the period in which employees become unconditionally entitled to the awards, subject to Liberty Global's estimate of the number of awards which will lapse, either due to employees leaving the group prior to vesting or due to non-market based performance conditions not being met. Where an award has market-based performance conditions, the fair value of the amount reflects the probability of achieving these via the option pricing model. The total amount recognised in the profit and loss account as an expense is adjusted to reflect the actual number of awards that vest, except where forfeiture is due to the failure to meet market-based performance measures.

2.7 Trade and other debtors

Trade and other debtors are initially measured at fair value and subsequently reported at amortised cost, net of an allowance for impairment of trade debtors.

The company uses a forward looking impairment model which uses a lifetime expected loss allowance which is estimated based upon our assessment of anticipated loss related to uncollectible accounts receivable. We use a number of factors in determining the allowance, including, among other things, collection trends, prevailing and anticipated economic conditions, and specific customer credit risk. The allowance is maintained until either payment is received or the likelihood of collection is considered to be remote.

2.8 Creditors

Creditors are obligations to pay for goods or services that have been acquired in the ordinary course of business from suppliers. Creditors are recognised initially at fair value and subsequently measured at amortised cost using the effective interest method.

Creditors are presented as amounts falling due within one year unless payment is not due within 12 months after the reporting period.

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

2. Accounting policies (continued)

2.9 Non derivative financial instruments

Cash and cash equivalents, current trade and other debtors, related-party debtors and payables, certain other current assets, creditors, certain accrued liabilities and value-added taxes (VAT) payable represent financial instruments that are initially recognised at fair value and subsequently carried at amortised cost. Due to their relatively short maturities, the carrying values of these financial instruments approximate their respective fair values.

Loans and other debtors are financial assets with fixed or determinable payments that are not quoted in an active market. Such loans and other debtors are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition, loans and debtors are measured at amortised cost using the effective interest method, less any impairment losses.

The company initially recognises loans and receivables on the date they are originated. All other financial assets (including assets designated as fair value through the statement of profit or loss) are recognised initially on the trade date, which is the date that the company becomes a party to the contractual provisions of the instrument.

The company derecognises a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in such transferred financial assets that is created or retained by the company is recognised as a separate asset or liability.

The company initially recognises debt securities issued and subordinated liabilities on the date that they are originated. All other financial liabilities are recognised initially on the trade date, which is the date that the company becomes a party to the contractual provisions of the instrument.

The company derecognises a financial liability when its contractual obligations are discharged, cancelled or expire.

2.10 Foreign currencies

Transactions in foreign currencies are recorded at the rate ruling at the date of the transaction. Monetary assets and liabilities denominated in foreign currencies are translated at the rate of exchange ruling at the balance sheet date. The resulting exchange differences are taken to the profit and loss account.

2.11 Deferred tax

Deferred tax is provided using the liability method on temporary differences between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes at the reporting date.

Deferred tax liabilities are recognised for all taxable temporary differences, except:

- When the deferred tax liability arises from the initial recognition of goodwill or an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss.
- In respect of taxable temporary differences associated with investments in subsidiaries, associates and interests in joint ventures, when the timing of the reversal of the temporary differences can be controlled and it is probable that the temporary differences will not reverse in the foreseeable future.

Deferred tax assets are recognised for all deductible temporary differences, the carry forward of unused tax credits and any unused tax losses. Deferred tax assets are recognised to the extent that it is probable that taxable profit will be available against which the deductible temporary differences, and the carry forward of unused tax credits and unused tax losses can be utilised, except:

- When the deferred tax asset relating to the deductible temporary difference arises from the initial recognition of an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss.
- In respect of deductible temporary differences associated with investments in subsidiaries, associates and interests in joint ventures, deferred tax assets are recognised only to the extent that it is probable that the temporary differences will reverse in the foreseeable future and taxable profit will be available against which the temporary differences can be utilised.

The carrying amount of deferred tax assets is reviewed at each reporting date and reduced to the extent that it is no longer probable that sufficient taxable profit will be available to allow all or part of the deferred tax asset to be utilised. Unrecognised deferred tax assets are reassessed at each reporting date and are recognised to the extent that it has become probable that future taxable profits will allow the deferred tax asset to be recovered.

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

2. Accounting policies (continued)

2.11 Deferred tax (continued)

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply in the year when the asset is realised or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted at the reporting date.

Deferred tax relating to items recognised outside profit or loss is recognised outside of profit or loss.

Deferred tax items are recognised in correlation to the underlying transaction either in other comprehensive income or directly in equity.

Deferred tax assets and deferred tax liabilities are offset if a legally enforceable right exists to set off current tax assets against current income tax liabilities and the deferred taxes relate to the same taxable entity and the same tax authority.

2.12 Leases

On the lease commencement date, (i) a ROU asset is recognised representing the right to use an underlying asset and (ii) lease liabilities representing the company's obligation to make lease payments over the lease term. Lease and non-lease components in a contract are generally accounted for separately.

The company initially measures lease liabilities at the present value of the remaining lease payments over the lease term. Options to extend or terminate the lease are included only when it is reasonably certain that the option will be exercised. As most of the company's leases do not provide enough information to determine an implicit interest rate, a portfolio level incremental borrowing rate is used in the present value calculation. ROU assets are initially measured at the value of the lease liability, plus any initial direct costs and prepaid lease payments, less any lease incentives received.

ROU assets are generally depreciated on a straight-line basis over the shorter of the lease term or the useful life of the asset. Interest expense on the lease liability is recorded using the effective interest method.

3. Judgements in applying accounting policies and key sources of estimation uncertainty

In preparing these financial statements, management has made estimates and judgements that affect the application of the company's accounting policies and the reported amounts of assets, liabilities, income and expenses

Estimates and assumptions

Recoverability of intercompany debtors

Intercompany debtors are stated at their recoverable amount less any necessary provision. Recoverability of intercompany debtors is assessed annually and a provision is recognised if any indications exist that the debtors are not considered recoverable.

Depreciation of property, plant and equipment

Depreciation is provided on all property, plant and equipment, other than construction in progress, on a straight-line basis at rates calculated to write off the cost of each asset over its estimated useful life. The estimation of an assets useful economic life has a significant effect on the annual depreciation charge.

Implicit interest rate on leases

As most of the company leases do not provide enough information to determine an implicit interest rate, a portfolio level incremental borrowing rate is used, being the rate that the lessee would have to pay to borrow the funds necessary to obtain an asset of similar value to the right-of-use asset in a similar economic environment with similar terms, security and conditions.

Judgements

Recoverability of deferred tax assets

Deferred tax assets are recognised for unused tax losses and allowances to the extent that it is probable that taxable profit will be available against which the losses can be utilised. Significant judgement is required to determine the amount of deferred tax assets that can be recognised, based upon the likely timing and the level of future taxable profits together with future tax planning strategies.

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

4. Operating profit

The operating profit is stated after charging:

	Period from 31 July 2020 to 31 December 2021 £000
Depreciation of property, plant and equipment	629
Depreciation of right-of-use assets	60
Defined contribution pension cost	1,264

Certain expenses are specifically attributable to the company. Where costs are incurred by other group companies on behalf of the company, expenses are allocated to the company on a basis that, in the opinion of the directors, is reasonable.

The directors received no remuneration for qualifying services as directors of the company.

Auditor's remuneration of £20,000 for the audit of the financial statements has been borne by a fellow group undertaking and not recharged.

5. Employees

Staff costs were as follows:

	Period from 31 July 2020 to 31 December 2021 £000
Wages and salaries	24,637
Social security	2,200
Defined contribution pension cost	1,264
	28,101

The average monthly number of employees during the period was as follows:

	Period from 31 July 2020 to 31 December 2021 No.
Administrative staff	474

6. Finance income

	Period from 31 July 2020 to 31 December 2021 £000
Interest on amounts owed by group undertakings	12

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS
FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

7. Finance costs

	Period from 31 July 2020 to 31 December 2021 £000
Interest on amounts owed to group undertakings	377
Finance leases and hire purchase contracts	16
Net loss on foreign currency translation	29
	422

8. Income tax expense

Tax expense included in profit or loss:

	Period from 31 July 2020 to 31 December 2021 £000
Current tax	-
Total current tax	-
Deferred tax	
Total deferred tax	-
Tax on profit	-

LIBERTY GLOBAL SSC LIMITED

**NOTES TO THE FINANCIAL STATEMENTS
FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021**

8. Income tax expense (continued)

The tax assessed for the period is lower than the standard rate of corporation tax in the UK of 19%. The differences are explained below:

	Period from 31 July 2020 to 31 December 2021 £000
Profit before tax	1,260
Profit multiplied by standard rate of corporation tax in the UK of 19%	239
Effects of:	
Fixed asset differences	7
Group relief claimed without payment	(579)
Rate change adjustment on deferred tax	(104)
Movement in deferred tax not recognised	437
Tax charge	-

Factors affecting current and future tax charges

In March 2021, legislation was introduced to increase the UK corporate income tax rate from 19% to 25% from 1 April 2023. This rate change was substantively enacted on 24 May 2021 and enacted on 10 June 2021 (Finance Bill 2021)

Gross deferred tax assets in respect of fixed asset temporary differences of £590,000 and temporary differences on share-based remuneration and pensions of £1,157,000 have not been recognised as there is currently no persuasive evidence that there will be suitable taxable profits against which these timing differences will reverse.

9. Property, plant and equipment

	Property, plant and equipment £000	Construction in progress £000	Total £000
Cost			
At 31 July 2020	-	-	-
Additions	3,278	159	3,437
At 31 December 2021	3,278	159	3,437
Accumulated depreciation			
Charge for the period on owned assets	689	-	689
At 31 December 2021	689	-	689
Net book value			
At 31 December 2021	2,589	159	2,748

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS
FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

9. Property, plant and equipment (continued)

Property, plant and equipment include right-of-use assets of £1,141,000 that do not meet the definition of investment property

10. Trade and other debtors

	2021 £000
Due after more than one year	
Amounts owed by group undertakings	1,688
	2021 £000
Due within one year	
Amounts owed by group undertakings	4,830
Amounts owed by affiliates	238
Prepayments and accrued income	87
	5,155

Amounts owed by group undertakings falling due after one year represents a loan note which had a carrying value of £1,688,000 at the balance sheet date. The loan note is denominated in sterling, bears interest of 4.92% and matures in 2031.

Amounts owed by group undertakings falling due within one year are unsecured, interest free and repayable on demand.

Amounts owed by affiliates falling due within one year are unsecured, interest free and repayable on demand.

11. Creditors: amounts falling due within one year

	2021 £000
Trade payables	542
Amounts owed to group undertakings	1,303
Taxation and social security	349
Lease liabilities (note 13)	116
Accruals and deferred income	2,759
	5,069

Amounts owed to group undertakings due within one year are unsecured, interest free and repayable on demand.

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS
FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

12. Creditors: amounts falling due after more than one year

	2021 £000
Lease liabilities (note 13)	1,033
Amounts owed to group undertakings	1,708
	<u>2,741</u>

Amounts owed to group undertakings falling due after more than one year represents a loan note which had a carrying value of £1,708,000 at the balance sheet date. The loan note was denominated in sterling, bears interest of 5.25% and matures in 2030

13. Leases

General

The company enters into leases for real estate.

ROU assets

Right-of-use assets related to leased properties that do not meet the definition of investment properties are presented as property, plant and equipment.

	2021 £000
Land and building	<u>1,141</u>

Additions to the right-of-use assets during the 17 month period ended 31 December 2021 were £1,201,000.

Amounts recognised in the profit and loss account

The profit and loss account shows the following amounts relating to leases:

	2021 £000
Depreciation charge on right-of-use assets	
Land and building	<u>60</u>
	60
Impact of finance expense	<u>16</u>
	<u>76</u>

The total payment made for leases in 2021 was £69,000.

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS
FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

13. Leases (continued)

Maturities of the company's lease liabilities as of 31 December 2021 are presented below:

	2021 £000
Less than one year	165
One to five years	690
More than five years	468
	1,323
Impact of finance expense	(174)
	1,149
Lease liabilities	

	2021 £000
Current	116
Non current	1,033
	1,149

14. Share capital

	2021 £
Allotted, called up and fully paid	
1 Ordinary share of £1	1

On 31 July 2020, the company was incorporated and issued 1 ordinary share of £1 for consideration of £1.

15. Reserves

Retained earnings

Includes all current period retained profits.

LIBERTY GLOBAL SSC LIMITED

NOTES TO THE FINANCIAL STATEMENTS FOR THE 17 MONTH PERIOD ENDED 31 DECEMBER 2021

16. Share-based payments

The company has share-based payments to employees, including grants of performance-based and non-performance based incentive awards. These awards and payments include options, share appreciation rights ("SARs"), performance-based share appreciation rights ("PSARs"), restricted share units ("RSUs"), restricted share awards ("RSAs") and performance-based restricted share units ("PSUs") (together "share-based remuneration").

Performance-based incentive awards including "2019 Challenge Performance Awards" and "Liberty Global PSUs".

Non-performance based incentive awards granted under the Liberty Global 2014 Incentive Plan generally (i) vest (a) prior to 2020, 12.5% on the six-month anniversary of the grant date and then at a rate of 6.25% each quarter thereafter and (b) commencing in 2020, annually over a three-year period, and (ii) expire (1) prior to 2019, seven years after the grant date and (2) commencing in 2019, 10 years after the grant date.

Further information is available in more detail in the 2021 Liberty Global Annual Report which is available at www.libertyglobal.com.

The charge to profit and loss account for share-based payments for the period was £1,132,000.

17. Controlling parties

The company's immediate parent undertaking and controlling party at 31 December 2021 is Liberty Global Broadband I Limited, a company incorporated in the UK.

The smallest and largest group of which the company is a member and in to which the company's accounts were consolidated at 31 December 2021 is Liberty Global plc.

The company's ultimate parent undertaking and controlling party at 31 December 2021 was Liberty Global plc.

Copies of group accounts referred to above which include the results of the company are available on Liberty Global's website at www.libertyglobal.com or from the company secretary at Liberty Global plc, Griffin House, 161 Hammersmith Road, London, UK, W6 8BS.

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
Form 10-K

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

For the fiscal year ended December 31, 2021

OR

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

For the transition period from to

Commission file number 001-35961



Liberty Global plc

(Exact name of Registrant as specified in its charter)

England and Wales
(State or other jurisdiction of
incorporation or organization)

98-1112770
(I.R.S. Employer
Identification No.)

Griffin House
161 Hammersmith Rd
London
United Kingdom
(Address of principal executive offices)

W6 8BS
(Zip Code)

Registrant's telephone number, including area code: +44.208.483.6449 or 303.220.6600

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Class A ordinary shares	LBTYA	Nasdaq Global Select Market
Class B ordinary shares	LBTYB	Nasdaq Global Select Market
Class C ordinary shares	LBTYK	Nasdaq Global Select Market

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 ☒

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 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. 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 definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act. Check one:

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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

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

State the aggregate market value of the voting and non-voting common equity held by non-affiliates, computed by reference to the price at which the common equity was last sold, or the average bid and ask price of such common equity, as of the last business day of the Registrant's most recently completed second fiscal quarter: \$14.3 billion.

The number of outstanding ordinary shares of Liberty Global plc as of January 31, 2022 was: 174,319,920 shares of class A ordinary shares, 12,930,839 shares of class B ordinary shares and 335,620,135 shares of class C ordinary shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for the Registrant's 2022 Annual General Meeting of Shareholders are incorporated by reference in Part III of this Form 10-K.

LIBERTY GLOBAL PLC
2021 ANNUAL REPORT ON FORM 10-K
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PART I

Item 1. BUSINESS

Who We Are

We are Liberty Global plc (**Liberty Global**), an international converged broadband internet, video, fixed-line telephony and mobile communications services company. We are focused on building fixed-mobile convergence national champions, and we are constantly striving to enhance and simplify our customers' lives through quality services and products that give them the freedom to connect, converse, work and be entertained anytime, anywhere they choose. To that end, we deliver market-leading products through next-generation networks that connect retail and wholesale customers subscribing to over 85 million (at December 31, 2021) broadband internet, video, fixed-line telephony and mobile services across our brands. Our primary business operations are listed below, all of which we consolidate, with the exception of the VodafoneZiggo JV and the VMO2 JV (each as defined below). Additionally, our global investment arm, Liberty Global Ventures, has investments in more than 75 companies and funds in the fields of content, technology and infrastructure, including strategic stakes in companies such as Plume Design, Inc., ITV plc, Lions Gate Entertainment Corp, Univision Holdings Inc., the Formula E racing series and several regional sports networks.

Primary Business Operations:

<u>Brand</u>	<u>Entity</u>	<u>Location</u>	<u>Ownership⁽¹⁾</u>
	Telenet	Belgium	60.7%
	Sunrise UPC	Switzerland	100.0%
	Virgin Media	Ireland	100.0%
	UPC Poland ⁽²⁾	Poland	100.0%
	UPC Slovakia	Slovakia	100.0%
	Virgin Media - O2	United Kingdom (U.K.)	50.0%
	VodafoneZiggo	Netherlands	50.0%

(1) As of December 31, 2021.

(2) On September 22, 2021, we entered into a sale and purchase agreement (the **Purchase Agreement**), pursuant to which we agreed to sell 100% of UPC Poland (as defined below). Closing of the transaction is currently expected to occur in the first half of 2022. For more information see *General Development of Business* discussion below and note 6 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

General Development of Business

As a result of a series of mergers that were completed on June 7, 2013, Liberty Global became the publicly-held parent company of the successors by merger of Liberty Global, Inc. (the predecessor to Liberty Global) and Virgin Media Inc. (**Virgin Media**). In the following text, the terms “we”, “our”, “our company” and “us” may refer, as the context requires, to Liberty Global (or its predecessor) or collectively to Liberty Global (or its predecessor) and its subsidiaries, including any joint ventures. Unless otherwise indicated, convenience translations into United States (U.S.) dollars are calculated as of December 31, 2021, and operational data, including subscriber statistics and ownership percentages, are as of December 31, 2021.

Acquisitions and Dispositions

We have also completed a number of strategic acquisitions and dispositions over the last several years. We made these acquisitions and dispositions in order to execute on our strategy to concentrate on markets where we have focused on creating national champion converged businesses in core markets and to unlock significant synergies.

Acquisitions. Our significant acquisitions include:

- On November 11, 2020, we completed the acquisition of Sunrise Communications Group AG (**Sunrise**) through the settlement of the all cash public tender offer to acquire all of the outstanding shares of Sunrise (the **Sunrise Acquisition**). In April 2021, we completed a statutory “squeeze-out” procedure, under applicable Swiss law, to acquire the remaining Sunrise Shares that were not acquired pursuant to the tender offer and, accordingly, now hold 100% of the share capital of Sunrise. The combined business in Switzerland, which we wholly own, is now referred to as Sunrise UPC.
- On June 3, 2019, Telenet Group Holding N.V. (**Telenet**) acquired the remaining 50.0% of De Vijver Media NV (**De Vijver Media**) that it did not already own (the **De Vijver Media Acquisition**). De Vijver Media provides content production, broadcasting and advertising services in Belgium.
- On June 19, 2017, Telenet acquired Coditel Brabant sprl, operating under the brand name SFR BeLux (**SFR BeLux**), which provided broadband operations in Belgium (Brussels and Wallonia) and Luxembourg.

Joint Ventures. We completed the following significant joint venture transactions during 2021:

- On September 1, 2021, we (i) contributed certain assets and liabilities to a newly-formed 50:50 joint venture (the **Atlas Edge JV**) that was established for the purpose of acquiring and commercializing European technical real estate for edge colocation and hosting services and (ii) sold certain other assets to the Atlas Edge JV. In addition, we sold certain other assets to the Atlas Edge JV during the fourth quarter of 2021. We account for our 50% interest in the Atlas Edge JV as an equity method investment.
- On June 1, 2021, Liberty Global and Telefónica, S.A. (**Telefónica**) completed a transaction (the **U.K. JV Transaction**) whereby (i) we contributed Virgin Media’s U.K. operations and certain other Liberty Global subsidiaries to a 50:50 joint venture (the **VMO2 JV**) and (ii) Telefónica contributed its U.K. mobile business to the VMO2 JV, creating a nationwide integrated communications provider. We account for our 50% interest in the VMO2 JV as an equity method investment.

Dispositions. We have also completed the following dispositions during the past several years:

- On July 31, 2019, we completed the sale of our operations in Germany, Romania, Hungary and the Czech Republic to Vodafone Group plc (**Vodafone**). The operations of Germany, Romania, Hungary and the Czech Republic are collectively referred to herein as the “**Vodafone Disposal Group**.” In connection with the sale of the Vodafone Disposal Group, we have agreed to provide certain transitional services to Vodafone for a period of up to four years. These services principally comprise network and information technology-related functions.
- On May 2, 2019, we completed the sale of our direct-to-home satellite (**DTH**) operations, which serves customers in Hungary, the Czech Republic, Slovakia and Romania (**UPC DTH**) to M7 Group (**M7**). In connection with the sale of UPC DTH, we agreed to provide certain transitional services to M7 for a period of up to two years. These services principally comprised network and information technology-related functions.
- On July 31, 2018, we completed the sale of our Austrian operations (**UPC Austria**) to Deutsche Telekom AG (**Deutsche Telekom**). In connection with the sale of UPC Austria, we have agreed to provide certain transitional

services to Deutsche Telekom for a period of up to four years. These services principally comprise network and information technology-related functions.

- On December 29, 2017, we effected the split-off of our LiLAC Group (the **Split-off Transaction**) by distributing 100% of the common shares of Liberty Latin America Ltd. (**Liberty Latin America**) to holders of our then LiLAC ordinary shares (the **LiLAC Shares**). The “**LiLAC Group**” consisted of our businesses, assets and liabilities in Latin America and the Caribbean, including C&W, VTR.com SpA, a 60% interest in Liberty Cablevision of Puerto Rico LLC and related cash and cash equivalents and indebtedness. Following such distribution, the LiLAC Shares were redesignated as deferred shares (with virtually no economic rights) and subsequently canceled. In connection with the Split-off Transaction, Liberty Latin America became a separate publicly-traded company.

Pending Transaction

On September 22, 2021, we entered into the Purchase Agreement, pursuant to which we agreed to sell 100% of our operations in Poland (**UPC Poland**) to a third party for a total enterprise value of Polish zloty (**PLN**) 7,025.0 million (\$1,743.8 million), subject to customary debt and working capital adjustments at completion. Closing of the transaction, which we currently expect to occur in the first half of 2022, is subject to the satisfaction of certain conditions, including receipt of requisite regulatory approvals.

The proceeds from the sale are expected to be used (i) to repay a portion of the UPC Holding borrowing group’s outstanding indebtedness and (ii) for general corporate purposes, which may include reinvestment into our business and support for our share repurchase program.

We have agreed to provide certain transitional services for a period of up to five years, depending on the service. These services principally will comprise network and information technology-related functions. The annual charges will depend on the actual level of services required by the purchaser.

For additional information on our acquisitions, pending and completed dispositions and joint ventures see notes 5, 6 and 7 to our consolidated financial statements, respectively, included in Part II of this Annual Report on Form 10-K. In addition, we have completed various other smaller acquisitions and dispositions in the normal course of business. Further, we are evaluating a change in jurisdiction of incorporation to Bermuda, which has U.S.-style corporate laws and lower administrative costs. To the extent we determine to move forward with any re-domicile transaction, we would seek shareholder approval in advance.

Equity Transactions

Share repurchases are an important part of our strategy in creating value for our shareholders. Pursuant to our most recent share repurchase program authorized by our board of directors, we are authorized to repurchase ten percent of our outstanding shares (measured at the start of each year) during each of 2022 and 2023. The following table provides the details of our share repurchases during 2021:

<u>Title of shares</u>	<u>Number of shares</u>	<u>Average price paid per share⁽¹⁾</u>	<u>Aggregate purchase price⁽¹⁾ in millions</u>
Class A ordinary shares	8,445,800	\$ 27.31	\$ 230.6
Class C ordinary shares	49,604,048	\$ 27.23	1,350.5
			<u>\$ 1,581.1</u>

⁽¹⁾ Amounts include direct acquisition costs.

For a further description of our share repurchases, see note 14 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

Forward Looking Statements

Certain statements in this Annual Report constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. To the extent that statements in this Annual Report are not recitations of historical fact, such statements constitute forward-looking statements, which, by definition, involve risks and uncertainties that could cause actual results to differ materially from those expressed or implied by such statements. In particular, statements under *Item 1. Business*, *Item 1A. Risk Factors*, *Item 2. Properties*, *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* and *Item 7A. Quantitative and Qualitative Disclosures About Market Risk* may contain forward-looking statements, including statements regarding our business, product, foreign currency and finance strategies, our property and equipment additions, subscriber growth and retention rates, competitive, regulatory and economic factors, the timing and impacts of proposed transactions, the maturity of our markets, the potential impact of the coronavirus (COVID-19) on our company, the anticipated impacts of new legislation (or changes to existing rules and regulations), anticipated changes in our revenue, costs or growth rates, our liquidity, credit risks, foreign currency risks, interest rate risks, target leverage levels, debt covenants, our future projected contractual commitments and cash flows, our share repurchase programs and other information and statements that are not historical fact. Where, in any forward-looking statement, we express an expectation or belief as to future results or events, such expectation or belief is expressed in good faith and believed to have a reasonable basis, but there can be no assurance that the expectation or belief will result or be achieved or accomplished. In evaluating these statements, you should consider the risks and uncertainties discussed under *Item 1A. Risk Factors* and *Item 7A. Quantitative and Qualitative Disclosures About Market Risk*, as well as the following list of some but not all of the factors that could cause actual results or events (including with respect to affiliates) to differ materially from anticipated results or events:

- economic and business conditions and industry trends in the countries in which we or our affiliates operate;
- the competitive environment in the industries and in the countries in which we or our affiliates operate, including competitor responses to our products and services;
- fluctuations in currency exchange rates and interest rates;
- instability in global financial markets, including sovereign debt issues and related fiscal reforms;
- consumer disposable income and spending levels, including the availability and amount of individual consumer debt;
- changes in consumer television viewing and broadband usage preferences and habits;
- consumer acceptance of our existing service offerings, including our broadband internet, television, fixed-line telephony, mobile and business service offerings, and of new technology, programming alternatives and other products and services that we may offer in the future;
- our ability to manage rapid technological changes and the rate at which our current technology becomes obsolete;
- our ability to maintain or increase the number of subscriptions to our broadband internet, television, fixed-line telephony and mobile service offerings and our average revenue per household;
- our ability to provide satisfactory customer service, including support for new and evolving products and services;
- our ability to maintain or increase rates to our subscribers or to pass through increased costs to our subscribers;
- the impact of our future financial performance, or market conditions generally, on the availability, terms and deployment of capital;
- changes in, or failure or inability to comply with, government regulations and legislation in the countries in which we or our affiliates operate and adverse outcomes from regulatory proceedings;
- government intervention that requires opening our broadband distribution networks to competitors, such as the obligations imposed in Belgium;
- our ability to obtain regulatory approval and shareholder approval and satisfy other conditions necessary to close acquisitions and dispositions and the impact of conditions imposed by competition and other regulatory authorities in connection with acquisitions;
- our ability to successfully acquire new businesses and, if acquired, to integrate, realize anticipated efficiencies from, and implement our business plan with respect to, the businesses we have acquired or that we expect to acquire;
- changes in laws or treaties relating to taxation, or the interpretation thereof, in the U.K., the U.S. or in other countries in which we or our affiliates operate;

- changes in laws and government regulations that may impact the availability and cost of capital and the derivative instruments that hedge certain of our financial risks;
- our ability to navigate the potential impacts on our business resulting from the U.K.'s departure from the European Union (E.U.);
- the ability of suppliers and vendors (including our third-party wireless network providers under our mobile virtual network operator (MVNO) arrangements) to timely deliver quality products, equipment, software, services and access;
- the availability of attractive programming for our video services and the costs associated with such programming, including production costs, retransmission and copyright fees payable to public and private broadcasters;
- uncertainties inherent in the development and integration of new business lines and business strategies;
- our ability to adequately forecast and plan future network requirements;
- the availability of capital for the acquisition and/or development of telecommunications networks and services;
- the availability, cost and regulation of spectrum;
- problems we may discover post-closing with the operations, including the internal controls and financial reporting process, of businesses we acquire;
- successfully integrating in the time or within the budgets estimated for such integrations;
- operating costs, customer loss and business disruption, including maintaining relationships with employees, customers, suppliers or vendors may be greater than expected in connection with our acquisitions;
- our ability to realize the expected synergies from our acquisitions in the amounts anticipated or on the anticipated timelines;
- our ability to profit from investments in joint ventures that we do not solely control;
- the leakage of sensitive customer data;
- the outcome of any pending or threatened litigation;
- the loss of key employees and the availability of qualified personnel;
- changes in the nature of key strategic relationships with partners and joint venturers;
- our capital structure and factors related to our debt arrangements; and
- events that are outside of our control, such as political unrest in international markets, terrorist attacks, malicious human acts, natural disasters, epidemics, pandemics (such as COVID-19) and other similar events.

The broadband distribution and mobile service industries are changing rapidly and, therefore, the forward-looking statements of expectations, plans and intent in this Annual Report are subject to a significant degree of risk. These forward-looking statements and the above-described risks, uncertainties and other factors speak only as of the date of this Annual Report, and we expressly disclaim any obligation or undertaking to disseminate any updates or revisions to any forward-looking statement contained herein, to reflect any change in our expectations with regard thereto, or any other change in events, conditions or circumstances on which any such statement is based. Readers are cautioned not to place undue reliance on any forward-looking statement.

Description of Business

We are one of the world's leading converged video, broadband and communications companies, with a commitment to providing our customers the "best in class" communications and entertainment services. These services are delivered to our residential and business customers over our networks and include broadband internet, video, telephony and mobile services. Telenet, the VMO2 JV, the VodafoneZiggo JV and Sunrise UPC deliver mobile services as mobile network operators, VM Ireland and UPC Poland deliver mobile services as MVNOs through third-party networks. Sunrise UPC also delivers some mobile services as an MVNO pursuant to a legacy contract that is being phased out as a result of the Sunrise Acquisition. We design our services to enable our customers to access the digital world on their own terms and at their own pace. Offering "best in class" connectivity is at the core of our strategy. Today, our extensive broadband network enables us to deliver ultra high-speed internet service across our markets, be it through fiber, cable or mobile technology. We are striving to extend our reach and reinforce our speed leadership. In most of our footprint we offer converged fixed and mobile experiences in and out of the home, and it is our ambition to further enhance this proposition and make it available to all our customers.

We provide residential and business telecommunication services in Ireland through Virgin Media Ireland, Belgium through Telenet, Switzerland through Sunrise UPC, Poland through UPC Poland and Slovakia through UPC Slovakia. We are a leading fixed network provider in each of these countries. We also have investments in the VodafoneZiggo JV and the VMO2 JV, each of which is a fixed network leader in their respective countries.

A breakdown of our revenue by major category for our consolidated reportable segments appears in note 19 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

By connecting our customers through our telecommunication services, we recognize that we are a global corporate citizen and that we play a role in addressing the environmental impacts generated through our business. By seeking to address these issues, we strengthen our company and provide strong benefits to the communities in which we operate. We remain a leader in our sector on climate change with an unwavering commitment to reducing our impact on the environment. We continue to improve our operations to meet our new 2030 and 2050 science-based targets in line with the Paris Climate Accord, including by working to become more carbon efficient and striving to minimize e-waste through our various environmental initiatives. Our gigabit broadband deployments in cities throughout our operating territories and efforts to accelerate the transition to 5G will underpin a low carbon economy, while revolutionizing healthcare, flexible working regimes and countless other aspects of our lives. Diversity and inclusion have long been priorities for Liberty Global and our operating companies, and will become even more integral moving forward. Over the past several years, Liberty Global, Virgin Media, the VodafoneZiggo JV, Telenet, Sunrise UPC, UPC Slovakia, UPC Poland and, since its inception, the VMO2 JV, have all pursued gender diversity as a strategic goal, with an emphasis on building a gender-diverse pipeline. Similarly, inclusion is a key focus area and we are committed to providing an environment that empowers everyone to bring their full selves to work while creating more inviting workplaces regardless of age, race, gender, ethnicity or sexual orientation.

Operating Data

The following tables present certain operating data as of December 31, 2021, with respect to the networks of our subsidiaries and significant joint ventures. The following tables reflect 100% of the data applicable to each of our subsidiaries and significant joint ventures regardless of our ownership percentage.

Consolidated Operating Data - December 31, 2021

	Homes Passed ⁽¹⁾	Fixed-Line Customer Relationships ⁽²⁾	Internet Subscribers ⁽³⁾	Video Subscribers ⁽⁴⁾	Telephony Subscribers ⁽⁵⁾	Total RGUs ⁽⁶⁾	Mobile Subscribers ⁽⁷⁾
Continuing operations:							
Belgium	3,403,800	2,032,300	1,725,700	1,762,000	1,100,200	4,587,900	2,950,200
Switzerland ⁽⁸⁾	2,484,400	1,476,900	1,166,200	1,239,800	1,021,200	3,427,200	2,610,300
Ireland	954,000	431,800	388,400	302,300	277,700	968,400	129,400
Slovakia	632,900	188,700	146,800	169,200	90,000	406,000	—
Total	7,477,100	4,129,700	3,427,100	3,473,300	2,489,100	9,389,500	5,689,900
Discontinued operations:							
Poland	3,703,400	1,569,400	1,350,500	1,397,200	598,600	3,346,300	121,300
VodafoneZiggo JV ⁽⁹⁾	7,328,000	3,738,800	3,328,200	3,729,800	2,064,700	9,122,700	5,365,400
VMO2 JV ⁽¹⁰⁾	15,649,900	5,768,300	5,596,800			13,390,200	32,276,800

- Homes Passed are homes, residential multiple dwelling units or commercial units that can be connected to our networks without materially extending the distribution plant. Certain of our Homes Passed counts are based on census data that can change based on either revisions to the data or from new census results. Due to the fact that we do not own the partner networks (defined below) used in Switzerland (see note 9 below), we do not report homes passed for Switzerland's partner networks.
- Fixed-Line Customer Relationships are the number of customers who receive at least one of our internet, video or telephony services that we count as Revenue Generating Units (RGUs), without regard to which or to how many services they subscribe. Fixed-Line Customer Relationships generally are counted on a unique premises basis. Accordingly, if an individual receives our services in two premises (e.g., a primary home and a vacation home), that individual generally will count as two Fixed-Line Customer Relationships. We exclude mobile-only customers from Fixed-Line Customer Relationships.
- Internet Subscribers are homes, residential multiple dwelling units or commercial units that receive internet services over our networks, or that we service through a partner network. In Switzerland, we offer a 10 Mbps internet service to our Video Subscribers without an incremental recurring fee. Our Internet Subscribers in Switzerland include 47,300 subscribers who have requested and received this service.
- Video Subscribers are homes, residential multiple dwelling units or commercial units that receive our video services over our broadband network or through a partner network. We have approximately 31,400 "lifeline" customers that are counted on a per connection basis, representing the least expensive regulated tier of video cable service, with only a few channels.
- Telephony Subscribers are homes, residential multiple dwelling units or commercial units that receive voice services over our networks, or that we service through a partner network. Telephony Subscribers exclude mobile telephony subscribers. In Switzerland, we offer a basic phone service to our Video Subscribers without an incremental recurring fee. Our Telephony Subscribers in Switzerland include 215,400 subscribers who have requested and received this service.
- RGU is separately a Video Subscriber, Internet Subscriber or Telephony Subscriber. A home, residential multiple dwelling unit, or commercial unit may contain one or more RGUs. For example, if a residential customer subscribed to our video service, fixed-line telephony service and broadband internet service, the customer would constitute three RGUs. Total RGUs is the sum of Video, Internet and Telephony Subscribers. RGUs generally are counted on a unique premises basis such that a given premise does not count as more than one RGU for any given service. On the other hand, if an individual receives one of our services in two premises (e.g., a primary home and a vacation home), that individual will count as two RGUs for that service. Each bundled cable, internet or telephony service is counted as a separate RGU regardless of the nature of any bundling discount or promotion. Non-paying subscribers are counted as subscribers during their free promotional service period. Some of these subscribers may choose to disconnect after their free service period. Services offered without charge on a long-term basis (e.g., VIP subscribers or free service to

employees) generally are not counted as RGUs. We do not include subscriptions to mobile services in our externally reported RGU counts. In this regard, our RGU counts exclude our separately reported postpaid and prepaid mobile subscribers.

- (7) Our Mobile Subscriber count represents the number of active subscriber identification module (**SIM**) cards in service rather than services provided. For example, if a mobile subscriber has both a data and voice plan on a smartphone this would equate to one mobile subscriber. Alternatively, a subscriber who has a voice and data plan for a mobile handset and a data plan for a laptop would be counted as two mobile subscribers. Customers who do not pay a recurring monthly fee are excluded from our mobile subscriber count after periods of inactivity ranging from 30 to 90 days, based on industry standards within the respective country. In a number of countries, our mobile subscribers receive mobile services pursuant to prepaid contracts. As of December 31, 2021, our mobile subscriber count included 457,500 and 320,400 prepaid Mobile Subscribers in Switzerland and Belgium, respectively.
- (8) Pursuant to service agreements, Switzerland offers broadband internet, video and telephony services over networks owned by third-party cable operators ("**partner networks**"). A partner network RGU is only recognized if there is a direct billing relationship with the customer. At December 31, 2021, Switzerland's partner network accounted for 113,100 Fixed-Line Customer Relationships and 291,800 RGUs, which include 106,800 Internet Subscribers, 102,500 Video Subscribers and 82,500 Telephony Subscribers. Subscribers to our video services provided over partner networks largely receive video services from the partner networks as opposed to our operations. Due to the fact that we do not own these partner networks, we do not include the 464,900 homes passed by Switzerland's partner networks at December 31, 2021. In addition, with the completion of the acquisition of Sunrise, we now service homes through Sunrise's existing agreements with Swisscom AG (**Swisscom**), Swiss Fibre Net and local utilities, which are not included in Switzerland's homes passed count. Including these arrangements, our operations in Switzerland have the ability to offer fixed services to a national footprint.
- (9) Amounts related to the VodafoneZiggo JV's fixed-line and mobile products include business and multiple dwelling unit subscribers. Prepaid mobile customers are excluded from the VodafoneZiggo JV's mobile subscriber count after a period of inactivity of nine months.
- (10) The mobile subscriber count for the VMO2 JV includes wholesale mobile subscribers. Prepaid mobile customers are excluded from the VMO2 JV's mobile subscriber count after a period of inactivity of three months.

Additional General Notes to Table:

Most of our broadband communications subsidiaries provide broadband internet, video, telephony, mobile, data or other business services. Certain of our business service revenue is derived from small or home office (**SOHO**) subscribers that pay a premium price to receive enhanced service levels along with video, internet or telephony services that are the same or similar to the mass marketed products offered to our residential subscribers. All mass marketed products provided to SOHOs, whether or not accompanied by enhanced service levels and/or premium prices, are included in the respective RGU and customer counts of our broadband communications operations, with only those services provided at premium prices considered to be "SOHO RGUs" or "SOHO customers". To the extent our existing customers upgrade from a residential product offering to a SOHO product offering, the number of SOHO RGUs or SOHO customers will increase, but there is no impact to our total RGU or customer counts. With the exception of our business SOHO subscribers, we generally do not count customers of business services as customers or RGUs for external reporting purposes.

In Belgium, Telenet leases a portion of its network under a long-term finance lease arrangement. These tables include operating statistics for Telenet's owned and leased networks.

While we take appropriate steps to ensure that subscriber statistics are presented on a consistent and accurate basis at any given balance sheet date, the variability from country to country in (1) the nature and pricing of products and services, (2) the distribution platform, (3) billing systems, (4) bad debt collection experience and (5) other factors add complexity to the subscriber counting process. We periodically review our subscriber counting policies and underlying systems to improve the accuracy and consistency of the data reported on a prospective basis. Accordingly, we may from time to time make appropriate adjustments to our subscriber statistics based on those reviews.

Subscriber information for acquired entities is preliminary and subject to adjustment until we have completed our review of such information and determined that it is presented in accordance with our policies.

Products and Services

Our main products and services are WiFi and internet services, video, mobile, and telephony services.

Intelligent WiFi and Internet Services

Connectivity is a critical building block for vibrant communities. As highlighted by the current COVID-19 pandemic, all aspects of society, including families, businesses, education and healthcare, to name a few, rely heavily on connectivity and the digital services that depend on it. To meet our customers' expectations of seamless connectivity, we are developing a fully digital, cloud based connectivity ecosystem that we call **"ONE Connect,"** built on top of our fiber-rich fixed broadband network and recently expanded mobile network. The ONE Connect is orchestrated by a fully cloud-based digital journey, enabling fast and flexible introduction of new hardware and services, as well as cloud to cloud open API integration, simplifying the on-boarding of new services and devices. The devices used within our ONE Connect ecosystem are connected and protected through our security gateway and VPN, both at home and on the go. At home, our customers can benefit from the gigabit speeds enabled by our **"Connect Box"** (described below), as well as **"Intelligent WiFi"**, which has optimization functionalities, such as the ability to adapt to the number of people and devices online at any given time in order to improve and extend wireless connectivity reach and speeds. We have completed the rollout of our award-winning Intelligent WiFi across all our markets. In addition, we introduced our first **"Smart Home"** bundles in select markets, enabling those customers to take their smart home ambitions to the next level, including enhanced entertainment, home automation and home security. Finally, our **"Connect App"** is the digital touchpoint that allows customers to access and manage all of our services.

Our Connect Box is our next generation intelligent WiFi and telephony gateway that enables us to maximize the impact of our ultrafast broadband networks by providing reliable wireless connectivity anywhere in the home. This gateway can be self-installed and allows customers to customize their home WiFi service. Our latest versions of the gigabit Connect Box are based on DOCSIS 3.1 technology and WiFi 6, providing even better in-home WiFi service. Our new DOCSIS 3.1 Connect Box runs our **"One Firmware"** stack, a middleware software system based on the Reference Design Kit for Broadband (**RDK-B**). RDK-B is an open source initiative with wide participation from operators, device manufacturers and silicon vendors that standardizes core functions used in broadband devices, set-top boxes and internet of things solutions. We have extended the One Firmware stack to support our ONE Connect ecosystem. One Firmware runs on system-on-a-chip (SoC) technology from multiple vendors and can run on any SOC that is RDK-B compliant, enabling greater speed and agility in on-boarding of new customer premises equipment platforms and ecosystem features, allowing us to build once and port to many. It is expected that we will roll-out One Firmware to the base of DOCSIS 3.0 legacy customer premises equipment during 2022. To support the adoption of fiber to the home, cabinet, building or node networks (fiber-to-the-home/-cabinet/-building/-node is referred to herein as **FTTx**) access in both on-net and off-net scenarios, we plan to add XGS-PON (an updated standard for passive optical networks that supports higher-speed 10 Gbps symmetrical data transfers) and Ethernet-based Connect Boxes with WiFi 6, providing speeds up to 10 Gbps that run our One Firmware and support our ONE Connect ecosystem. Our Connect Box is available in all our markets, and currently, approximately 11 million of our customers have a Connect Box. In addition to our core markets, we distribute our Connect Box to other markets in Europe, Latin America and the Caribbean. Robust wireless connectivity is increasingly important with our customers spending more and more time using bandwidth-heavy services on multiple devices. We also offer our Connect App that, among other things, allows our customers to optimize their WiFi coverage and manage their connected devices. In addition, we provide intelligent WiFi mesh boosters, which increase speed, reliability and coverage by adapting to the environment at home.

Internet speed is of crucial importance to our customers, as they spend more time streaming video and other bandwidth-heavy services on multiple devices. Our extensive broadband network enables us to deliver ultra-high-speed internet service across our markets. Our residential subscribers access the internet via cable modems connected to their internet capable devices, or wirelessly via a WiFi gateway device. We offer multiple tiers of broadband internet service up to Gigabit speeds and available to over 15 million homes across our footprint. The speed of service depends on the customer location and their service selected. In 2021, our networks continued to be recognized, with the VodafoneZiggo JV winning both the Best Internet Provider award in the Netherlands for the 11th year in a row and Best Fixed Network in the Netherlands.

By leveraging our existing fiber-rich broadband networks, we are in a position to deliver gigabit services by deploying the next generation DOCSIS 3.1 technology. DOCSIS 3.1 technology is an international standard that defines the requirements for data transmission over a cable system. Not only does DOCSIS 3.1 technology improve our internet speeds and reliability, it allows for efficient network growth. Currently, our ultra-high-speed internet service is based primarily on DOCSIS 3.1 technology, and we offer this technology in all of our markets. In 2022, the VMO2 JV completed an upgrade of its entire national network to gigabit speeds, such that every VMO2 JV customer has access to internet speeds of at least 1 Gbps.

We offer value-added broadband services in certain of our markets for an incremental charge. These services include Intelligent WiFi features, security (e.g., anti-virus, anti-spyware, firewall and spam protection), Smart Home services, and online storage solutions and web spaces. Subscribers to our internet service pay a monthly fee based on the tier of service selected. In addition to the monthly fee, customers pay an activation service fee upon subscribing to an internet service. This one-time fee may be waived for promotional reasons. We determine pricing for each different tier of internet service through an analysis of speed, market conditions and other factors.

In all of our markets, we have deployed community WiFi via routers in the home (the **Community WiFi**), which provides secure access to the internet for our customers. Community WiFi is enabled by a cable modem WiFi access point (**WiFi modem**) in a Connect Box, a set-top box or a Horizon box of our internet customers. The Community WiFi is created through the sharing of access to the public channel of our customers' home wireless routers. The public channel is a separate network from the secure private network used by the customer within the home and is automatically enabled when the WiFi modem is installed. Public WiFi access points (covering train stations, hotels, bars, restaurants and other public places) are also available for no additional cost.

Video Services

Our video service is, and continues to be, one of the foundations of our product offerings in our markets. Our cable operations offer multiple tiers of digital video programming and audio services, starting with a basic video service. Subscribers to our basic video service pay a fixed monthly fee and receive digital video channels (including a growing number of high definition (**HD**) and ultra-high definition 4K resolution (**4K**) channels) and several digital and analog radio channels, as well as an electronic programming guide. We tailor our video services in each country of operation based on programming preferences, culture, demographics and local regulatory requirements.

We also offer a variety of premium channel packages to meet the special interests of our subscribers. For an additional monthly charge, a subscriber may upgrade to one of our extended digital tier services and receive an increased number of video and radio channels, including the channels in the basic tier service and additional HD and 4K channels. Our channel offerings include general entertainment, sports, movies, series, documentaries, lifestyles, news, adult, children and ethnic and foreign channels.

Discounts to our monthly service fees are available to any subscriber who selects a bundle of two or more of our services (**bundled services**): video, internet, fixed-line telephony and, in most of our markets, mobile services. Bundled services consist of double-play for two services, triple-play for three services and, where available, quad-play for four services.

To meet customer demands, we have enhanced our video services with additional relevant content services and features, which increase viewing comfort and address individual user needs. Our latest next generation product suite is called "**Horizon 4**", a multi-screen entertainment platform that combines linear television (including recording and Replay TV features), premium video-on-demand ("**VoD**") offerings, an increasing amount of integrated premium global and local video apps and mobile viewing into one entertainment experience. Horizon 4 comes with a state-of-the-art personal user interface that is intuitively easy to navigate. Content recommendations and favorite channel settings can be customized to individual user profiles. Video playback control, such as pause and resume, navigation shortcuts and content searches can all be conducted via a voice control button on the remote control, a feature highly appreciated by our customers. Horizon 4 is available in all of our markets on the latest set top boxes capable of delivering 4K video content and achieved significant positive customer feedback, manifesting in high product net promoter score figures. Horizon 4 is marketed under the name "Telenet TV-Box" in Belgium, "UPC TV" and "Sunrise TV" in Switzerland, "Virgin TV360" in the U.K., through the VMO2 JV, and Ireland, "UPC TV 4K Box" in Poland and "MediaBox Next" in the Netherlands through the VodafoneZiggo JV.

The predecessor version of Horizon 4, Horizon 3, is deployed on set-top boxes in the Netherlands (through the VodafoneZiggo JV), Switzerland and Ireland. While in Switzerland and Ireland these set-top boxes will continue to be exchanged for the latest hardware with Horizon 4 over time, in the Netherlands the boxes can be flashed with the latest Horizon 4 software.

In the U.K., the forerunner product of Horizon 4 is based on the TiVo platform and was developed under a strategic partnership agreement with TiVo Inc. The TiVo platform is deployed on a basic set-top box as well as the Virgin Media V6 box. Similar to Horizon 4, the Virgin Media V6 box combines 4K video, including high dynamic range, with improved streaming functionalities and more processing power. The Virgin Media V6 box allows customers to record six channels simultaneously while watching a seventh channel. Customers can also start watching programming on one television and pick up where they left off on other boxes in another room or through an app on their smart phones and tablets. Over 70% of the VMO2 JV's customers have the Virgin Media V6 box. Similar to the deployed hardware in the Netherlands via the

VodafoneZiggo JV, over time these V6 boxes will be flashed with the latest Horizon 4 software, bringing our latest and most successful television and entertainment experience to the VMO2 JV's customers without the need of exchanging the installed hardware. The V6 boxes can now be flashed with the latest Horizon 4 software.

One of our key video services is **"Replay TV"**. Through Replay TV, the last seven days of content (subject to rights related to blackouts) is made available via the electronic programming guide (**EPG**) for on demand viewing. Customers can simply open the EPG, scroll back and replay linear programming instantly. This same technical solution also allows our customers to replay a television program from the start even while the live broadcast is in progress. Additionally, customers have the option of recording TV programs in the cloud (or onto the hard disk drive in the set top box in the U.K., through the VMO2 JV, and in Ireland). Replay TV is one of the most used and appreciated features on our platforms.

In most of our markets, we offer transactional VoD giving subscribers access to thousands of movies and television series. In several of our markets, our *subscription VoD service is included in certain of our video offerings. This service is tailored to the specific market based on available content, consumer preferences and competitive offers, and includes various programming, such as music, kids, documentaries, adult, sports and TV series. We continue to develop our VoD services to provide a growing collection of programming from local and international suppliers, such as Disney/Fox, NBC/Universal, CBS/Paramount, Warner Bros. and Sony, among others. In addition, in all of our markets we offer global premium over the top (OTT) services such as Netflix, YouTube and Amazon Prime Video, and we also offer local OTT services via a large portion of our set-top boxes.*

Most of this content is also available via our online mobile app, **"Horizon Go"**, which is available on mobile devices (iOS and Android) and, in some markets as well, via Amazon Fire TV, Apple TV and Android TV devices. Thanks to the 360 integration of Horizon 4 across multiple screens, customers can pause a program, series or movie and seamlessly continue watching from where they left off on another device, whether a television, tablet, smart phone or laptop. Additionally, Horizon Go enables customers to remotely schedule the recording of a television program on their Horizon 4 box at home.

In the summer of 2020, we launched our first IP-only streaming device in Poland, which runs the full Horizon 4 product suite and features a small puck-like form factor that can be tucked away behind a TV screen. This all-IP mini 4K capable TV box has extremely low power consumption, and its casing is made from recycled plastic, proudly winning us the Digital TV Europe's Video Tech Innovation Sustainability Award in December 2020 as well as the Red Dot Product Design Award in 2021. We have also launched the all-IP 4K capable TV box in Switzerland and intend to continue the roll out the all-IP TV box to additional markets. UPC Poland and the VodafoneZiggo JV announced in July and December of 2021, respectively, that they are entering into agreements with Nordic Entertainment Group (**NENT**) to provide the "Viaplay" streaming service, a new entrant to the Polish and Dutch markets.

Mobile Services

Mobile services are another key building block for us to provide customers with seamless connectivity. Telenet, the VMO2 JV, the VodafoneZiggo JV and UPC Sunrise offer mobile services as mobile network providers, and UPC Poland and Virgin Media in Ireland offer mobile services as an MVNO over third-party networks. Sunrise UPC and the VMO2 JV also offers mobile services under certain legacy MVNO agreements.

Where mobile telephony services are provided via MVNOs, the relevant mobile operator leases a third-party's radio access network and owns the core network, including switching, backbone and interconnections. An MVNO arrangement permits us to offer our customers in these markets mobile services without having to build and operate a cellular radio tower network.

Our MVNO partners are:

Country	Partner
U.K.	Vodafone / EE Limited ⁽¹⁾
Switzerland	Swisscom ⁽²⁾
Ireland	Three (Hutchison)
Poland	Orange/Play

(1) The VMO2 JV is in the process of migrating its subscribers to its platform, but certain subscribers currently remain on MVNO plans.

(2) Sunrise UPC in Switzerland is in the process of migrating its subscribers to the Sunrise UPC network, but certain subscribers currently remain on an MVNO plan.

In each of our markets, we offer a range of mobile related services. The majority of subscribers take a post-paid service plan, which has an agreed monthly fee for a set duration (typically 1 to 2 years). The monthly fee will vary depending on the country and service package selected. Service packages can have different levels of data allowances, voice minutes and network speed, as well as differing other aspects, such as roaming charges and contract duration. Post-paid services are also offered as a bundle with fixed services, and by taking a “converged” offering, customers typically receive some benefits such as lower total cost or additional features. Post-paid services are offered to both business and retail consumers. In addition, we offer pre-paid mobile services, where the customers pay in advance for a pre-determined amount of airtime or data and which generally have no minimum contract term. In countries where we operate as a mobile service operator, we also offer a number of MVNOs, where other mobile providers use our mobile network for their mobile offering.

Telephony Services

Multi-feature telephony services are available through voice-over-internet-protocol (VoIP) technology in most of our broadband communication markets. In the U.K., the VMO2 JV also provides traditional circuit-switched telephony services. We pay interconnect fees to other telephony and internet providers when calls by our subscribers terminate on another network and receive similar fees from providers when calls by their users terminate on our network through interconnection points.

Our telephony service may be selected in several of our markets on a standalone basis and in all of our markets in combination with one or more of our other services. Our telephony service includes a basic fixed-line telephony product for line rental and various calling plans, which may consist of any of the following: unlimited network, national or international calling, unlimited off-peak calling and minute packages, including calls to fixed and mobile phones. We also offer value added services, such as a personal call manager, unified messaging and a second or third phone line at an incremental cost.

Multiple Dwelling Units and Partner Networks

Pursuant to an agreement executed on June 28, 2008 (the **PICs Agreement**) with four associations of municipalities in Belgium (the pure intercommunales or **PICs**), Telenet leases the PICs broadband communications network and, accordingly, makes its services available to all of the homes passed by the cable network owned by the PICs. Telenet has a direct customer relationship with the video subscribers on the PICs network. Pursuant to the PICs Agreement, Telenet has full rights to use substantially all of the PICs network under a long-term finance lease. Unless extended, the PICs Agreement will expire on September 23, 2046, and cannot be terminated earlier (except in the case of non-payment or bankruptcy of Telenet). For additional information on the PICs Agreement, see note 18 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

For over 70% of the basic video subscribers of Sunrise UPC, Sunrise UPC maintains billing relationships with landlords or housing associations and provides basic video service to the tenants. The landlord or housing association administers the billing for the basic video service with their tenants and manages service terminations for their rental units. When tenants select triple-play bundles with or without mobile service from Sunrise UPC, they then migrate to a direct billing relationship with us.

Sunrise UPC offers broadband internet, enhanced video and telephony services directly to the video cable subscribers of those partner networks that enter into service operating contracts with Sunrise UPC. Sunrise UPC has the direct customer billing relationship with these subscribers. By permitting Sunrise UPC to offer some or all of its broadband internet, video and telephony products directly to those partner network subscribers, Sunrise UPC's service operating contracts have expanded the addressable markets for Sunrise UPC's digital products. In exchange for the right to provide digital products directly to the partner network subscribers, Sunrise UPC pays to the partner network a share of the revenue generated from those subscribers. Sunrise UPC also provides network maintenance services and engineering and construction services to its partner networks.

Business Services

In addition to our residential services, we offer business services in all of our operations. For business and public sector organizations, we provide a complete range of voice, advanced data, video, wireless and cloud-based services, as well as mobile and converged fixed-mobile services. Our business customers include SOHO (generally up to five employees), small business and medium and large enterprises. We also provide business services on a wholesale basis to other operators.

Our business services are designed to meet the specific demands of our business customers with a wide range of services, including increased data transmission speeds and virtual private networks. These services fall into five broad categories:

- data services for fixed internet access, with a 4G connectivity backup, IP virtual private networks based on SDWAN solutions, and high-capacity point-to-point services, including dedicated cloud connections;
- cloud collaboration VoIP solutions and circuit switch telephony, unified communications and conferencing options;
- wireless services for mobile voice and data, as well as managed WiFi networks;
- video programming packages and select channel lineups for targeted industries or full programming packages for SOHO customers; and
- value added services, including managed security systems, cloud enabled business applications, storage and web hosting.

Our intermediate to long-term strategy is to enhance our capabilities and offerings in the business sector so we become a preferred provider in the business market. To execute this strategy, customer experience and strategic marketing play a key role.

Our business services are provided to customers at contractually established prices based on the size of the business, type of services received and the volume and duration of the service agreement. SOHO and small business customers pay business market prices on a monthly subscription basis to receive enhanced service levels and business features that support their needs. For more advanced business services, these customers generally enter into a service agreement. For medium to large business customers, we enter into individual agreements that address their needs. These agreements are generally for a period of at least one year.

Investments

VMO2 JV. Liberty Global owns 50% of the VMO2 JV, a fixed-mobile convergence provider in the U.K., providing mobile, broadband, video and fixed telephony services to millions of customers across its footprint. As part of the U.K. JV Transaction, Liberty Global entered into a shareholders agreement with Telefónica, owner of O2 in the U.K. This agreement sets forth the corporate governance of the VMO2 JV, as well as its decision-making process, information access, dividend policy and non-competition provisions. The shareholders agreement mandates that the VMO2 JV distribute to Liberty Global and Telefónica on a quarterly basis a pro rata dividend equaling (unless agreed otherwise) all unrestricted cash, subject to certain minimum thresholds and financing arrangements. Subject to certain exceptions, Liberty Global may not transfer its ownership interest in the VMO2 JV without consent from Telefónica. Additional information on the shareholders agreements can be found in note 7 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

As a fixed-mobile convergence provider in the U.K., the VMO2 JV offers gigabit internet across its entire footprint, reaching over 15.6 million homes, while also providing its customers with access to one of the U.K.'s leading 4G and 5G mobile networks. The VMO2 JV had 13.4 million RGUs as of December 31, 2021, primarily comprised of approximately 5.6 million broadband internet subscribers, and approximately 32.3 million mobile subscribers. The VMO2 JV does not report video or telephony subscribers on an individualized basis, although such subscribers are included in the RGU figures in the above section titled *Liberty Global Statistics*.

The VMO2 JV's customers continue to have access to Horizon TV and its functionalities (marketed as "Virgin TV 360"), including Catch up, Startover and pause live TV, the Virgin TV Go app and VoD, along with access to a range of premium subscription-based and pay per view services.

The VMO2 JV has 1 Gbps broadband internet available to residential customers across its footprint and was recognized as the Fastest Broadband Provider in uSwitch's 2021 awards. 500 Mbps broadband internet is available to business customers. Fiber-to-the-premise upgrade pilots are underway ahead of the planned deployment of full fibre across the entire fixed network starting in 2022 with completion in 2028. The VMO2 JV has also deployed an extensive "Community WiFi" network.

The VMO2 JV offers 5G and 4G wireless services under either a prepaid or postpaid service plan. The VMO2 JV provides its mobile services under various licenses, and most recently acquired new spectrum licenses in April 2021 in 700 MHz and 3.6 GHz band. At the same auction, the VMED O2 JV agreed to trade holdings in the 3.4 – 3.8 GHz range with Vodafone.

With its mobile services, the VMO2 JV is able to offer quad-play bundles and converged services to its residential and business customers.

VodafoneZiggo JV. We own a 50% interest in the VodafoneZiggo JV, which is a leading Dutch company that provides fixed, mobile and integrated communication and entertainment services to consumers and businesses in the Netherlands. In connection with the formation of the VodafoneZiggo JV, we entered into a shareholders agreement with Vodafone providing

for the governance of the VodafoneZiggo JV, including decision-making processes, information access, dividend policy and non-compete provisions. It also provides for restrictions on transfer of interests in the VodafoneZiggo JV and exit arrangements. Under the dividend policy, the VodafoneZiggo JV is required to distribute all unrestricted cash to Vodafone and us, subject to minimum cash requirements and financing arrangements. We also entered into a framework agreement with the VodafoneZiggo JV to provide access to each partner's expertise in the telecommunications business. For additional information on the above agreements, see note 7 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

The fiber-rich broadband network of the VodafoneZiggo JV passes 7.3 million homes. The VodafoneZiggo JV also offers nationwide 4G and 5G mobile coverage. At December 31, 2021, the VodafoneZiggo JV had 9.1 million RGUs, of which 3.7 million were video, 3.3 million were broadband internet and 2.1 million were fixed-line telephony. In addition, the VodafoneZiggo JV had 5.4 million mobile customers. Besides its residential services, the VodafoneZiggo JV offers extensive business services throughout the Netherlands. The operations of the VodafoneZiggo JV are subject to various regulations, which are described below under *Regulatory Matters—Joint Venture Entities—The Netherlands*.

The VodafoneZiggo JV's customers continue to have access to Horizon TV and its functionalities (marketed as "Ziggo TV"), including Replay TV, the Ziggo Go app, pause live TV and VoD, 1 Gbps for residential and business customers nationwide broadband internet and an extensive WiFi community network. The VodafoneZiggo JV also has its own sports channel, Ziggo Sport, and offers some exclusive programming. Additionally, as of December 2021, the VodafoneZiggo JV has made 1 Gbps broadband internet available in 5.3 million households. The VodafoneZiggo JV's customers also have access to Vodafone's nationwide 4G (referred to herein as **LTE**) and 5G wireless services, under either a prepaid or postpaid service plan. The VodafoneZiggo JV provides its mobile services under various licenses that have a weighted average useful life of approximately 18 years as of December 31, 2021. With its mobile services, the VodafoneZiggo JV is able to offer quad-play bundles and converged services to its residential and business customers.

Additional Business Information

Ventures

Liberty Global's investment arm, Liberty Global Ventures, has amassed a portfolio of investments in more than 75 companies and funds across the world, investing in the fields of content, technology and infrastructure. With its long-term, founder friendly mindset, Liberty Global Ventures makes meaningful investments in technologies that will change how people live and work tomorrow. Some of the companies in Liberty Global's portfolio include All3Media, Plume, ITV, Lionsgate, Univision, Formula E racing series, Aviatrix, Pax8, Lacework and Edgeconnex, among others. When advantageous, we seek to forge commercial relationships between our operating companies and the companies we invest in, creating an even stronger partnership to help drive growth and efficiencies.

Technology

Our broadband internet, video and fixed-line telephony services are primarily transmitted over a hybrid fiber coaxial (**HFC**) cable network. This network is composed primarily of national and regional fiber networks, which are connected to the home over the last few hundred meters by coaxial cable. Alongside our HFC network, we are increasingly rolling out services based on fiber to the home (**FTTH**) and leveraging fixed wireless access (**FWA**) technologies to service customers not covered by our fixed networks in areas where it may not be cost effective to deploy fixed networks.

We closely monitor our network capacity and customer usage. Where necessary, we increase our capacity incrementally, for instance by splitting nodes in our cable network. We also continue to explore improvements to our services and new technologies that will enhance our customer's connected entertainment experience. These actions include:

- recapturing bandwidth and optimizing our networks by:
 - increasing the number of nodes in our markets;
 - increasing the bandwidth of our hybrid fiber coaxial cable network to 1 GHz;
 - converting analog channels to digital;
 - moving channels to IP delivery;
 - deploying additional DOCSIS 3.1 channels;
 - replacing copper lines with modern optic fibers; and

- using digital compression technologies.
- freeing spectrum for high-speed internet, VoD and other services by encouraging customers to move from analog to digital services;
- increasing the efficiency of our networks by moving headend functions (encoding, transcoding and multiplexing) to cloud storage systems;
- enhancing our network to accommodate business services;
- using wireless technologies to extend our services outside of the home;
- offering remote access to our video services through laptops, smart phones and tablets;
- expanding the availability of Horizon TV and Virgin TV Go, as well as Horizon 4, and related products and developing and introducing online media sharing and streaming or cloud-based video; and
- testing new technologies.

As stated above, we are expanding our HFC and FTTH footprint. In addition, we are seeking mobile service opportunities where we have established cable networks and expanding our fixed-line networks where we have a strong mobile offering. This will allow us to offer converged fixed-line and mobile services to our customers.

We deliver high-speed data and fixed-line telephony over our broadband network in our markets. The cable networks of our operations in Europe are connected to our “Aorta” backbone. The Aorta backbone is recognized as a Tier 1 Carrier, which permits us to serve our customers through settlement free collaboration with other carriers without the cost of using a third-party network.

In support of our connectivity strategy, we are moving our customers into a gigabit society. All of our broadband networks are already capable of supporting the next generation of ultra-high-speed internet service at gigabit speeds. To provide these speeds to our subscribers, we plan to grow our base of DOCSIS 3.1 technology throughout our footprint. The use of DOCSIS 3.1 technology provides us significantly higher efficiencies on our networks and allow us to offer faster speeds, in-home WiFi and better services. The new gateways and the continued upgrades to our network in the coming years will allow us to maximize high-speed connectivity over our broadband networks and deliver gigabit services in a cost-effective manner. It will also allow us to meet the expectations of our customers for high-speed internet access both in cities and rural areas of our footprint. While DOCSIS 3.1 technology will provide up to 2.5 Gbps, in 2022, we plan to deploy XGS-PON technology across our FTTH footprint, enabling speeds of up to 10Gbps. In addition, we will begin to prototype DOCSIS 4 technology that is anticipated to equally provide 10Gbps capabilities across our HFC footprint.

Supply Sources

Content. In our markets, entertainment platforms remain a key part of the telecommunication services bundle. Therefore, in addition to providing services that allow our customers to view programming when and where they want, we are investing in content that customers want. Our content strategy is based on:

- proposition (exceeding our customers' entertainment desires and expectations);
- product (delivering the best content available);
- procurement (investment in the best brands, shows and sports); and
- partnering (strategic alignment, acquisitions and growth opportunities).

We license almost all of our programming and on-demand offerings from content providers and third-party rights holders, including broadcasters and cable programming networks. Under our channel distribution agreements, we generally pay a monthly fee on a per channel or per subscriber basis, with occasional minimum pay guarantees. For on-demand programming, we generally pay a revenue share for transactional VoD (occasionally with minimum guarantees) and either a flat fee or a monthly fee per subscriber for subscription VoD. For a majority of our agreements, we seek to include the rights to offer the licensed programming to our customers through multiple delivery platforms and through our apps for smart phones and tablets.

In seeking licenses for content, we, including the VMO2 JV and the VodafoneZiggo JV, as applicable, partner with leading international and regional Pay TV providers, such as Disney/Fox, Warner Media (including HBO), Sony, UKTV Viacom, AMC, NBCUniversal, RTL, the BBC and Discovery. We also seek to carry in each of our markets key public and private broadcasters and in some markets we acquire local premium programming through select relationships with companies such as

Sky plc (**Sky**) BT Group plc (**BT**), HBO and Canal+. For our VoD services, we license a variety of programming, including box sets of television series, movies, music, kids' programming and documentaries.

In recent years, OTT apps have become increasingly important in the content space and, as part of our content strategy, we have put in place deals with a number of global and regional app providers. We currently have arrangements with Netflix International B.V. (**Netflix**) and with Amazon Europe Core S.A.R.L. (**Amazon**). Pursuant to these arrangements, the Netflix service and Amazon Prime Video services respectively are available via certain of our set-top boxes to our video customers across many of our markets each as premium OTT services. The Netflix app is available to customers in the U.K., through the VMO2 JV, the Netherlands through the VodafoneZiggo JV, Ireland, Switzerland and Belgium. The Amazon Prime Video app is currently available to our customers in the U.K. through the VMO2 JV, Ireland, the Netherlands through the VodafoneZiggo JV, Belgium, Switzerland and Poland. We also entered into an arrangement with, Google Ireland Limited (**Google**) for the YouTube and YouTube Kids services, apps for which are available via certain of our set top boxes to our customers in the U.K. through the VMO2 JV, Ireland, the Netherlands through the VodafoneZiggo JV, Belgium, Switzerland and Poland. In order to tailor our entertainment offerings to each market we have added various locally relevant apps such as BBC iPlayer in the U.K. through the VMO2 JV, NPO Start and Videoland in the Netherlands through the VodafoneZiggo JV, VRT NU in Belgium and BluePlay in Switzerland. In addition, we have concluded deals with NENT for the Viaplay service in the Netherlands, through the VodafoneZiggo JV, where the service is due to launch in March 2022 and in Poland where the service is already available as a premium service.

Exclusive content is another element of our content strategy. To support this approach, we are investing in content assets. We have invested in various content companies, including ITV plc, All3Media Ltd., LionsGate Entertainment, Virgin Media TV (formerly TV3 Group in Ireland) and De Vijver Media. We are also investing in sports, both as a broadcaster and as a rights owner. We have our own sports channels, Play Sports in Belgium which is exclusively available to Telenet customers, MySports in Switzerland, which Sunrise UPC licenses to other platforms in Switzerland, and VMSports in Ireland. Also, the VodafoneZiggo JV owns Ziggo Sport and commissions the production of certain shows such as Rondo and Race Cafe. The basic Ziggo Sport service is available exclusively to the VodafoneZiggo JV's customers; however, the premium service is widely available through license arrangements.

In addition, we have commissioned our own drama series content. Through All3Media Ltd., we co-produced a television series, known as *The Feed*, which was released in 2019 in several of our markets, and co-produced *Blood* in Ireland, which aired in 2018 and 2020. With Lionsgate Entertainment, we pre-purchased the spy thriller series *The Rook*, which premiered in 2019. In addition, we have produced the Swiss sitcom *Fassler-Kunz*, the Swiss series *Im Heimatland* and the original Belgium series *Chaussée d'Amour* and *De Dag* with local production companies. These television series will primarily be available to our customers on an on-demand basis. We will also continue to commission, produce and/or co-produce content for our free-to-air (**FTA**) assets and VoD platforms in Ireland, and Telenet will continue to commission, produce and/or co-produce content for its FTA assets via SBS Belgium and VoD platforms in Belgium mainly via Streamz, its newly created joint venture for subscription VoD with DPG Media.

Customer Premises Equipment. We purchase each type of customer premises equipment from a number of different suppliers. Customer premises equipment includes set-top boxes, modems, WiFi routers and boosters, digital video recorders (**DVRs**), tuners and similar devices. For each type of equipment, we retain specialists to provide customer support. For our broadband services, we use a variety of suppliers for our network equipment and the various services we offer. Similarly, we use a variety of suppliers for mobile handsets to offer our customers mobile services.

Software Licenses. We license software products, including email and security software, and content, such as news feeds, from several suppliers for our internet services. The agreements for these products typically require us to pay a fee for software licenses and/or a share of advertising revenue for content licenses. For our mobile network operations and our fixed-line telephony services, we license software products, such as voicemail, text messaging and caller ID, from a variety of suppliers. For these licenses we seek to enter into long-term contracts, which generally require us to pay based on usage of the services.

For our mobile services provided through MVNO arrangements, we are dependent on third-party wireless network providers. Each of our MVNO operations has an agreement with such a provider to carry the mobile communications traffic of our customers. We seek to enter into medium to long-term arrangements for these services. Any termination of these arrangements could significantly impact our MVNO operated mobile services.

Competition

All of our businesses operate in highly competitive and rapidly evolving markets. The speed of technological advancements is likely to continue to increase, giving customers more options for telecommunications services. Our customers want access to high quality telecommunication products that provide seamless connectivity and experience. Accordingly, our ability to offer converged services (video, internet, fixed telephony and mobile) is a key component of our strategy. In many of our markets, we compete with incumbent companies that provide converged mobile and fixed-line services, as well as companies that are established in one or more communication products. Consequently, our businesses face significant competition. In all markets, we seek to differentiate our offerings by focusing on delivering quality high-speed internet at competitive prices and providing excellent customer service. In this section, we begin with an overview on the competitive nature of the broadband internet, video and mobile and fixed-line telephony services in our markets, and then provide information on key competitors in our more material markets.

We believe that our deep-fiber access provides us with several competitive advantages. For instance, our cable networks enable concurrent delivery of internet access, together with real-time television and VoD content, without impairing our high-speed internet service. In addition, our cable infrastructure allows us to provide triple-play bundled services of broadband internet, television and fixed-line telephony services without relying on a third-party service provider within our footprint. Our business capabilities allow us to provide a comprehensive set of converged mobile and fixed-line services through both our own mobile network and third-party networks. Our capacity is designed to support peak consumer demand, and our networks have been resilient despite significantly increased demand during the COVID-19 pandemic. In serving the business market, many aspects of the network can be leveraged at very low incremental costs.

Overall, we are experiencing increased convergence as customers look to receive all their media and communication services in a more cost-effective way. In our largest markets, our key competitors are: Proximus NV/SA (**Proximus**) (Belgium) and Swisscom (Switzerland). Also, as described below in the following sections, the key competitors for the VMO2 JV are BT and SKY, and for the VodafoneZiggo JV, it is Koninklijke KPN N.V. (**KPN**) and T-Mobile (currently owned by Deutsche Telekom). Each of these competitors have extensive resources allowing them to offer competitively priced converged services. As a result, our ability to offer high quality triple-play or quad-play bundles and fixed-mobile convergence bundles is one of our key strategies to attract and retain customers. We seek to distinguish ourselves through our multimedia gateway services, interactive video products (such as Replay TV and VoD), proprietary sports offerings, expanded content offers (for both in and out of the home) and our high-speed connectivity services backed by intelligent in-home WiFi solutions.

Internet

Our businesses face competition in a rapidly evolving broadband marketplace from both incumbent and non-incumbent telecommunications companies, mobile operators and cable-based internet service providers, many of which have substantial resources. The internet services offered by these competitors include both fixed-line broadband internet via cable, digital subscriber lines (**DSL**) or FTTx and wireless broadband. These competitors have a range of product offerings with varying speeds and pricing, as well as interactive services, data and content services offered to households and businesses. With the demand for mobile internet services increasing, competition from wireless services using various advanced technologies is an important competitive factor. In several of our markets, competitors offer high-speed mobile data via LTE networks as well as next generation 5G wireless technology which is in the active roll-out phase. In this intense competitive environment, internet speed and pricing are the key criteria for customers.

Our strategy is seamless speed leadership. Our focus is on increasing the maximum speed of our connections while providing a reliable customer experience and offering a variety of service tiers, prices, bundled products and a range of value-added services, including intelligent in-home connectivity solutions. We update our bundles and packages on an ongoing basis to meet the needs of our customers and to retain an attractive value for money ratio. Ultra-high download speeds of 1Gbps are available throughout our operational footprints in each of the U.K., Belgium and Switzerland, as well as over 70% of our operational footprint in the Netherlands, with the view towards availability throughout our full footprint in the Netherlands by the end of 2022. We use our competitively priced ultra-high-speed internet services to encourage customers to switch to our services from other providers. Our aim is to safeguard our high-end customer base and enable us to become more aggressive at the low- and medium-end of the internet market. By fully utilizing up to 1 Gbps technical capabilities of DOCSIS 3.1 technology on our cable systems, we can compete with any FTTx, DSL or LTE players today.

Across Europe, our key competition in this product market is from the offering of broadband internet products using various FTTx and DSL-based technologies by the incumbent players and third parties. The introduction of cheaper and ever faster fixed-line broadband offerings by alternative network providers is further increasing the competitive pressure in this market. A notable emerging factor is an overbuild of our networks with FTTx technology by the incumbent players and other

third parties. At the moment, we do not consider our networks to be critically overbuilt; however certain FTTx providers have announced plans to accelerate their FTTx rollout. We are confident that our hybrid fiber-coaxial networks can be upgraded to higher speeds, to match or exceed potential FTTx based products. Furthermore, in some instances FTTx upgrades or new build could provide an opportunity for Liberty Global or its joint venture entities to take wholesale access and expand our geographical coverage. For instance, the VMO2 JV has announced plans to upgrade its entire fixed network in the U.K. to full fiber-to-the-premise, costing marginally more than its previously planned DOCSIS 4 upgrade.

- Telenet. In the Flanders region of Belgium, Telenet is the leading provider of residential broadband internet services. Telenet's primary competitor is Proximus. Proximus is a well-established competitor offering quad-play bundles. Proximus' DSL and very high-speed DSL technology (VDSL) services provide download speeds up to 100 Mbps. Moreover, Proximus offers up to 1 Gbps speed via its fiber network that is available in selected cities and being actively deployed. Similar to its video services, Telenet faces competition in the provision of internet services from other providers who have wholesale access to Telenet's cable network. Through such access, Orange Belgium currently offers its mobile subscribers a triple-play bundle including enhanced video, mobile and fixed broadband internet services. Furthermore, Orange Belgium has announced an acquisition of Voo, a telecom operator that owns cable networks in the Wallonia region of Belgium. This might indicate further intensification of market competition where Telenet is using its ultra-high-speed 1Gbps connectivity and innovative fixed-mobile converged packages called ONE and ONE(Up) to promote its services and retain its customer base. Furthermore, Telenet recently announced the intention to create a new, self-funded netco with utility company Fluvius that hopes to own the "data network of the future" in the Flanders region.

• Sunrise UPC. In Switzerland, Swisscom is the largest provider of broadband internet services, and is Sunrise UPC's primary competitor. It is also continuing to expand its FTTx network and is rolling-out its G.fast technology. Swisscom offers download speeds ranging from 50 Mbps to up to 10 Gbps, depending on the region. Swisscom continues to expand its FTTx network to Switzerland households in our footprint, as well as in our partner network footprints. Salt, a predominantly mobile player, also competes in this arena, with a focus on fixed-mobile convergence through a combination of FTTx and fixed wireless access technologies offering 10 Gbps internet speeds. In this competitive market, Sunrise UPC recently launched a new "Sunrise We" fixed-mobile convergence portfolio, enabling customers to benefit from the ultra-high-speed connectivity that is available across all of Sunrise UPC's customer premises and offers significant fixed and mobile cross-selling opportunities. For more information on the Sunrise Acquisition, see note 5 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

- Joint Ventures.

In the U.K., the VMO2 JV faces numerous competitors for broadband internet services, the largest of which is BT. BT is actively building out its FTTx network through its subsidiary, Openreach, to support its goal of covering 25 million homes by the end of 2026. In support of this mission, BT has launched a range of ultrafast consumer packages offering speeds of up to 900 Mbps. At the moment, we estimate the VMO2 JV's fixed network to be 25% overbuilt by BT but it has had limited impact on the VMO2 JV's headline indicators so far. As noted above, the VMO2 JV reached 1Gbps connectivity in all its approximately 15.6 million premises. Moreover, the VMO2 JV announced its intention to upgrade its fixed network to full fiber-to-the-premise by the end of 2028. This plan is expected to fuel connectivity innovation for consumers and businesses, create options to potentially pursue the broadband wholesale market in the U.K and to protect from growing FTTx competition. In addition, we currently see limited competition from mobile broadband developments, such as LTE and 5G mobile services and WiFi services.

The VodafoneZiggo JV's primary competitor, KPN offers internet protocol television (IPTV) over its FTTx network and through broadband internet connections using DSL or VDSL or an enhancement to VDSL called "vectoring". Where KPN has enhanced its VDSL system, it offers broadband internet with download speeds of up to 200 Mbps, and on its FTTx networks, it offers download speeds of up to 1 Gbps. Portions of the VodafoneZiggo JV's network have been overbuilt by KPN's and other providers' FTTx networks. In 2021, KPN established a joint venture company called Glaspoort. Glaspoort will invest over one billion Euros in fiber roll-out over the next five years. The original scope of Glaspoort included approximately 685,000 households in medium-dense areas and about 225,000 business premises. Later in 2021, these plans were increased by approximately 170,000 households. KPN will continue to pursue its existing fiber roll-out plans of roughly 2.5 million additional households in the coming five years, with Glaspoort's scope expected to accelerate KPN's goal to reach approximately 80% FTTx coverage by 2026. We expect competitive pressure from the fiber overbuild to intensify in the coming periods. At the end of 2021, over 70% of the

VodafoneZiggo JV's 7.3 million households had access to ultra-fast 1Gbps connectivity to support our competitive edge and speed advantage.

Video Distribution

Our video services compete primarily with traditional FTA broadcast television services, DTH satellite service providers, OTT and broadcaster VoD providers, as well as other fixed-line and mobile telecommunications carriers and broadband providers offering a similar range of video services. Many of these competitors have a national footprint and offer features, pricing and video services individually and in bundles comparable to what we offer. In certain markets, we also compete with other cable providers who have overbuilt portions of our systems.

OTT video content providers utilizing our or our competitors' high-speed internet connections are also a significant competitive factor, as are other video service providers that overlap our service areas. The OTT video providers (such as HBO Now, Amazon Prime Video, Netflix, Disney+ and AppleTV+) offer VoD service for television series, movies and programming from broadcasters. Generally, the content libraries of such services are offered for a monthly fee. Typically these services are available on multiple devices in and out of the home. Moreover, broadcasters offer direct to customer content, including VoD, live and catch-up television via their own platforms (such as BBC iPlayer, Discovery and RTL). To retain our competitive position, we provide our subscribers with TV everywhere products and premium OTT video services through our online mobile apps, VoD and Replay TV services or through our arrangements with Netflix and Amazon, as well as YouTube and relevant local OTT VoD services. Our businesses also compete to varying degrees with other sources of information and entertainment, such as online entertainment, newspapers, magazines, books, live entertainment/concerts and sporting events.

Our ability to attract and retain customers depends on our continued ability to acquire appealing content, provide easy to use services on acceptable terms and to deliver content on multiple devices inside and outside the home. Some competitors have obtained long-term exclusive contracts for certain programming, which limits the opportunities for other providers to offer such programs. Our operations have limited access to certain of such programming through select contracts with these companies, including Sky and BT in the U.K. and Ireland. Moreover, telecommunication providers increasingly offer access to OTT platforms through their systems. If exclusive content offerings increase through other providers, programming options could be a deciding factor for subscribers on selecting a video service.

Similar to our technological advances in our video services (such as launches of Horizon 4, apps on third-party devices and all-IP TV box), our competitors are also improving their video platforms with next generation set-top boxes, TV everywhere products and other interactive services. In all of our markets, competitive video services are offered by both incumbent and non-incumbent telecommunications operators, whose strategies include video services over DSL, VDSL and FTTx networks and, in some cases, DTH and digital terrestrial television (**DTT**). The ability of incumbent operators to offer the triple-play of broadband internet, video and fixed-line telephony services and, in most countries, a quad-play with mobile services, is exerting competitive pressure on our operations, including the pricing and bundling of our video products. In order to gain video market share, the incumbent operators and alternative service providers in a number of our larger markets are pricing their DTT, IPTV or DTH video packages at a discount to the retail price of the comparable digital cable service.

We compete on value by offering advanced digital services with a premier user interface, such as cloud recording and DVR functionality, HD/4K, VoD, voice control, OTT aggregation, Replay TV and multiscreen services via a superior user interface. We also compete by offering attractive content packages, as well as bundled services, at reasonable prices. In each of the countries where we operate, we tailor our packages to include attractive channel offerings and offer recurring discounts for bundled services and loyalty contracts, as well as integrated billing for OTT services. In addition, from time to time, we modify our digital channel offerings to improve the quality of our programming. Where mobile voice and data are available, we focus on our converged service offerings at attractive prices. In our other operations, we use the triple-play bundle as a means of driving video, as well as other products where convenience and price can be leveraged across the portfolio of services. We also continue to enhance our Horizon 4 platform to meet our customers' desire to view programming anytime and anywhere, such as new applications and expanding its availability in our markets.

- Telenet. Telenet's principal competitor is Proximus, the incumbent telecommunications operator, which has interactive digital television, replay television, VoD, OTT and HD service as part of its video offer, as well as mobile-only video propositions tailored to the needs of younger market segments. Proximus offers customers a wide range of both individual and bundled services at competitive prices. Also, Telenet and other Belgian cable operators must give alternative providers access to their cable networks. Orange Belgium N.V. (**Orange Belgium**) gained such access in 2016 and currently offers its mobile subscribers a triple play bundle, including mobile, enhanced video and broadband internet services. Telenet may face increased competition from other providers of video services who take advantage

of the wholesale access and may be able to offer triple- and quad-play services. For more information on wholesale access, see *Regulatory Matters—Belgium*.

In order to compete effectively against alternative providers, Telenet leverages its extensive cable network, the broad acceptance of its basic cable television services and Yelo Play and its additional features, such as HD and DVR functionality, VoD offerings, its Play Sports channel and original programming delivered via the Horizon 4 multimedia box. Telenet is able to offer international, national, regional and local content, including Dutch-language broadcasts, to its subscribers. It is also using mobile services to drive its other products through its converged offerings. In addition, during 2021, Telenet and DPG Media launched a new streaming platform called Streamz, which combines some of the best locally produced series and must-see international content from HBO, extensive kids' content, films and documentaries. Streamz is available for a monthly fee.

Sunrise UPC. Our main competitor in Switzerland is Swisscom, the incumbent telecommunications operator, which provides IPTV services over DSL, VDSL and FTTx networks. Swisscom offers VoD services, DVR and replay functionality, HD channels and has exclusive rights to distribute certain sports programming. Swisscom launched an advanced set-top box in the market with voice control, Smart Home integration and content aggregation beyond video, such as music streaming and gaming services. Although its presence is limited, Salt focuses on value propositions by including TV within their bundles and providing access to OTT via Apple TV. In this saturated market, price competition and high promotional intensity are significant factors. To compete effectively in Switzerland, Sunrise UPC is promoting Horizon 4 (marketed as “UPC TV”) and related family of products together with Replay TV and VoD, giving subscribers the ability to personalize their programming and viewing preferences while delivering excellent user interface with voice control. Sunrise UPC has its own sports channel, My Sports and aggregates third-party apps (e.g. Netflix, Amazon Prime Video and YouTube). Moreover, in October 2021, Sunrise UPC expanded its video product offering to Yallo, its ancillary brand. This is an important step in moving Yallo to full telecommunications functionality, allowing Yallo customers to access over 270 channels (many in Full HD and Dolby Digital), Replay services and streaming apps such as Netflix, Disney+ and Amazon Prime which come pre-installed on the TV box. For more information on the Sunrise Acquisition, see note 5 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

Joint Ventures.

The VMO2 JV's principal competitors for digital television services are Sky and FTA television providers. Other significant competitors are BT and TalkTalk Telecom Group plc (**TalkTalk**), each of which offer triple-play services, IPTV video services and multimedia home gateways. Sky owns the U.K. rights to various entertainment, sports and movie programming. Sky is both a principal competitor and an important supplier of content to us. Various Sky channels, including Sky Sports, are available over Sky's satellite system and our cable networks, as well as via Sky's apps and online players and other television platforms, and some of the channels are available on BT and TalkTalk platforms. The VMO2 JV distributes several basic and premium video channels supplied by Sky. BT is also both a principal competitor and an important supplier of content to us. BT owns premium BT Sport channels, providing a range of sports content, including football (soccer) from the English Premier League and exclusive rights to the UEFA Champions League and the UEFA Europa League. The BT Sport channels are available on our cable network as well as our competitors' networks. The VMO2 JV is expanding its broadband network and actively promoting its 4K and HDR ready boxes running on its latest Horizon 4 platform (marketed as “Virgin TV360”) as well as its online streaming service, Virgin TV Go. Customers also have access to third-party apps such as Netflix, Amazon Prime Video and YouTube.

The VodafoneZiggo JV primarily competes with KPN with respect to video distribution, an incumbent telecommunications operator, which provides IPTV services over DSL, VDSL and FTTx networks. KPN offers many of the same interactive video service features as the VodafoneZiggo JV does including VoD services, DVR, replay functionality and HD channels. KPN also offers its customers bundling packages that include its video products, creating a highly competitive market for the VodafoneZiggo JV's products and services.

Mobile and Telephony Services

In Belgium, as a mobile network operator (**MNO**), we are one of the larger mobile providers based on number of SIM cards. The same is true for the VodafoneZiggo JV in the Netherlands. We also substantially expanded our mobile business with the acquisition of Sunrise in Switzerland and through the joint venture with O2 in the U.K. In our other European markets, however, we currently have limited mobile presence. In the markets where we are an MNO, we continue to deploy additional bandwidth to deliver our wide range of services to our customers and expand our LTE and 5G services. Where we are a small

mobile provider, we face significant competition from established mobile brands as well as ancillary, low-cost brands. Competition remains significant across each of our markets. We offer various calling plans, such as unlimited calling, national or international calling, unlimited off-peak calling and minute packages, including calls to fixed and mobile phones. In addition, we use converged bundles and benefits to cross-sell mobile to our existing fixed customers. Our ability to offer fixed-mobile convergence services is a key driver of growth.

The market for fixed-line telephony services is saturated in almost all of our markets. Changes in market share are driven by the combination of price and quality of services provided and the inclusion of telephony services in bundled offerings. Our fixed-line telephony services compete against the incumbent telecommunications operators. In all of our markets, we also compete with other VoIP operators offering service across broadband lines. In addition, our businesses face competition from other cable telephony providers, FTTx-based providers or other indirect access providers.

In each of our markets, we face competition with a dominant fixed-line telephony provider, most of which also have competitive mobile offers based on LTE or 5G services. In our largest markets, the key dominant telephony providers are Proximus (Belgium) and Swisscom (Switzerland). These telephony competitors are also the largest mobile operators in these markets based on number of SIM cards. These competitors include their mobile products in bundles with fixed-line services. Moreover, there is a fundamental shift in customer preference towards mobile. As a result, we expect fixed telephony users to decline in favor of mobile connectivity.

Human Capital Resources

As of December 31, 2021, our consolidated subsidiaries had an aggregate of approximately 11,200 full-time equivalent employees, including approximately 120 in the United States, 1,100 in the U.K., 900 in the Republic of Ireland, 3,450 in Belgium, 930 in the Netherlands, 3,120 in Switzerland, 1,320 in Poland, and 290 in Slovakia. With respect to our major non-consolidated joint ventures, the VodafoneZiggo JV employs approximately 6,360 people, and the VMO2 JV employs approximately 16,710 people. None of the above figures include contractors and temporary employees.

A majority of our European employees are represented by workers councils. We strive to maintain a positive relationship with all of our employees, as well as the workers councils representing them where applicable. There have been no significant interruptions of our operations in recent years due to labor disputes.

In challenging our employees to achieve their full potential, become purposeful leaders and to *Grow With Us*, we commit significant resources and make ongoing investments toward the development of our employees' leadership skills. Our skills development offerings cover key talent communities - from graduates and apprentices, to people managers, emerging leaders and senior leaders. Such programs include our Finance, Technology, CyberSecurity and People graduate schemes that thrust new graduates into our fast-paced and dynamic business model, giving them immediate real-world experience along with structured support from the company, so that each graduate exits their program prepared to be a leader of tomorrow. Liberty Global invests significantly in its employees because it recognizes that when each employee is supported and given the opportunity to succeed, the company as a whole flourishes.

We are resolved to building a safe, accepting and inclusive culture in our workplace and have been actively involved in similar efforts in our local communities. A diverse and inclusive culture is critical to our performance, reputation and innovation, and it brings us closer to the communities in which we live and operate. In 2021, we built upon our redefined efforts toward Diversity, Equity & Inclusion (**DE&I**). In addition to appointing a new Chief DE&I Officer and further developing our DE&I Council, composed of our CEO and 19 executive representatives from around the company, we launched five Employee Resource Groups (**ERGs**) focusing on gender, race and ethnicity, multigenerational households, ability and neurodiversity and sexual orientation. The VMO2 JV and VodafoneZiggo JV, along with Sunrise UPC, also have their own ERGs to provide support to their local employees. We also conduct compulsory anti-bullying, anti-discrimination and anti-harassment training for all of our employees and engage in small-group, impactful conversations centering on discrimination and harassment in the workplace. Further, Liberty Global's venture capital group has committed \$10 million to investing in start-up companies, including through our partner, Avesta Capital, that make a positive impact on society. These companies, such as Blue Studios, Kiira Health, BoxPower, Harvest Thermal and Sunny Day Fund are specifically focused on socially conscious business practices such as tackling economic and social inequity, as well as climate change.

Our compensation program is key to our company's success and incentivizes our management team to execute our financial and operational goals. We concentrate on attracting, retaining and motivating talented executives who can be responsive to new and different opportunities for our company and thereby create value for our customers and shareholders. The primary goals of our executive compensation program are to: motivate our executives to maximize their contributions to

the company's success, attract and retain the best leaders for our business and align our executives' interests with creating shareholder value.

At Liberty Global we are committed to the health and safety of our employees and visitors to our sites and we ensure compliance with all relevant national health and safety regulations. The continuing COVID-19 pandemic provides a powerful reminder of the critical role that connectivity plays in our lives. As an essential service provider to families, businesses, hospitals and schools, our COVID-19 response has been strong and well-received in our markets. We have prioritized the safety and well-being of our employees and customers while maintaining the highest-quality video, voice and broadband services, despite exceptional demands on our networks. For employees, we have embarked on a hybrid work-from-home/work-from-office pilot program while increasing health measures within our offices. We have made available a series of well-being resources based on a four-pronged strategy focused on the mental, physical, social and financial aspects of health and well-being. Included in this strategy, among other things, is access to group training sessions, private work-out facilities, bicycle reimbursement plans, in-office flu vaccinations, and private check-up visits.

We measure employee engagement quarterly against external benchmarks defined by a leading human resources consultant. We perform in line with global industry benchmarks and exceed benchmarks set by high performing organizations in areas such as inclusion, well-being, manager support and senior leadership communication. The high performing comparison group is comprised of organizations with strong financial performance and superior human resource practices, representing the gold standard for employee engagement. Survey results are owned by managers and executives, who are accountable for formulating action plans. In addition, we gather qualitative and quantitative insights with methods such as shorter-term pulse surveys and narrower focus groups. This approach informs decision making across key employee focus areas, including for example, well-being, work-from-home opportunities and skills development.

Additional information on our workforce and our commitment to our employees is made available in Liberty Global's Annual Corporate Responsibility Report, which we expect to be published on our website at the beginning of the third quarter of 2022.

Regulatory Matters

General Overview

Video distribution, broadband internet, fixed-line telephony and mobile businesses are regulated in each of the countries in which we operate. The scope of regulation varies from country to country, although in some significant respects regulation in European markets is harmonized under the regulatory structure of the E.U.

Of the seven countries in our footprint, five are part of the E.U.: the Republic of Ireland, the Netherlands (non-consolidated), Belgium, Slovakia and Poland. Our other operations are in the U.K. (non-consolidated) and Switzerland, both of which have separate jurisdictions but generally enact rules similar to that of the E.U.

The U.K. formally left the E.U. on January 31, 2020, commonly referred to as "**Brexit**". On December 24, 2020, the U.K. and the E.U. reached the "Trade and Cooperation Agreement" referred to as the "**E.U.-U.K. Agreement**". Principles on state aid are also contained in the E.U.-U.K. Agreement to prevent either side from granting unfair subsidies, and a dispute settlement mechanism is provided to ensure businesses from the E.U. and the U.K. compete on a level playing field. In relation to the telecommunications sector, the U.K. and the E.U. have agreed to maintain the existing levels of liberalization in their markets, including standard provisions on authorizations, access to and use of telecoms networks, interconnection, fair and transparent regulation and the allocation of scarce resources. The E.U.-U.K. Agreement contains measures to encourage cooperation and promote fair and transparent rates for international mobile roaming. However, the U.K. previously introduced a number of measures aimed at providing safeguards for consumers, which continue to apply. Such measures include limits on the amount that customers can be charged for using mobile data abroad before having to opt in if they wish to use more data and alert warnings as customers reach various milestones in data allowances included within their packages. Additionally, the Northern Irish Protocol regulates the relationship between Northern Ireland and the Republic of Ireland, ensuring that no hard border is placed between the two, as well as keeping Northern Ireland inside the E.U. single market. The Northern Irish Protocol, while not material to our or the VMO2 JV's operations, affects the movement of consumer premises equipment and installation personnel between Northern Ireland and the Republic of Ireland.

In Switzerland, most aspects of the distribution of radio and television are regulated under the Radio and television Act. In addition, the Competition Act, the Data Protection Act and the Act on the Surveillance of Post and Telecommunications (the **Telecommunications Act**) are potentially relevant to our business.

The European Electronic Communications Code (the **Code**) is the primary source of regulation governing our E.U. operations. The Code came into effect on December 20, 2018 and is in the process of being transposed by the Member States and the U.K. into their respective national laws. On September 23, 2021, the European Commission warned a number of Member States for being late with the transposition, including Ireland, the Netherlands, Poland and Slovakia. The Member states in question were required to adopt and notify the relevant measures within two months - which we have not seen to date. The Commission may refer their cases to the Court of Justice of the European Union. The U.K. has largely transposed the Code into its national laws. Switzerland, while not part of the E.U., has a regulatory system that partially reflects the principles of the E.U. The Telecommunications Act in Switzerland regulates, in general, the transmission of information, including the transmission of radio and television signals.

The Code primarily seeks to develop open markets for communication services within Europe. It harmonizes the rules within the E.U. for the establishment and operation of electronic communication networks, including cable television and traditional telephony networks, and the offer of electronic communication services, such as telephony (including OTT services), internet and, to some degree, television services.

Set forth below are certain key provisions included in the Code that are most applicable to our operations.

- **Significant Market Power.** Specific obligations imposed by National Regulatory Authorities (**NRA**s) in E.U. Member States apply only to service providers deemed to have Significant Market Power (**SMP**) in a relevant market. For purposes of the Code, a service provider has SMP where it enjoys a position of significant economic strength, affording it the power to behave independently of competitors, customers and consumers to an appreciable extent.

If a service provider is found to have SMP in any particular market, the applicable NRA must impose certain conditions on that service provider. We have been found to have Significant Market Power in certain markets in which we operate and further findings of Significant Market Power are possible, which may negatively impact our business. However, across our footprint, we have noticed an increased tendency of NRAs towards deregulation, with only a small number of markets currently being subject to this type of regulation.

The U.K. has a similar system with the applicable NRA assessing markets on a forward-looking basis to determine SMP. In Switzerland, there is no such forward-looking system, rather a service provider can be regulated based on general competition law.

- **Must-Carry Obligations.** Member States may impose reasonable must-carry obligations on certain service providers under their jurisdiction. Such obligations must be based on clearly defined general interest objectives, be proportionate and transparent and be subject to periodic review. The U.K. and Switzerland have a regulatory system that reflects these principles. We are subject to must carry regulations in all markets in which we operate, and we do not expect the such obligations to be curtailed in the foreseeable future.

Net Neutrality, Roaming and Call Termination

In November 2015, the European Parliament adopted the regulation on the first E.U.-wide net neutrality regime. The regulation allows for specialized services, optimized for specific content and subjects service providers like Liberty Global to reasonable traffic management requirements. The U.K. transposed net neutrality into its national law following its exit from the E.U. The Telecommunications Act, in Switzerland introduced more transparent net neutrality regulation that allows for traffic management in very limited circumstances (e.g., to fight exceptional network congestion). Customers must be informed if traffic is treated unequally and about the quality of the internet service (for both fixed and mobile internet).

The 2015 regulation mentioned above also prohibits retail roaming tariffs and sets wholesale roaming price caps. In 2019 the E.U. introduced caps on wholesale rates for intra-E.U. calls to bring these in line with the wholesale roaming caps. The Telecommunications Act in Switzerland implemented roaming obligations, including mandatory discounted roaming packages, per second or per kilobyte of roaming charges and capped fees for all roaming services. In relation to the U.K., E.U. operators are now free to raise wholesale charges for U.K. operators (and vice-versa) but may choose not to.

Call termination tariffs for SMP providers are set by NRAs, but for the E.U., the Code includes a system of single maximum E.U.-wide voice termination rates for fixed and mobile. In 2022, all fixed service providers will be subject to a maximum fixed termination rate of €0.07 per minute and by 2024 the single maximum rate for mobile termination will be €0.20 per minute. In the U.K., an SMP provider must provide termination on fair and reasonable terms, conditions and charges, which

must be no higher than BT's regulated charges unless certain conditions are met. In all countries where we operate, we have been found to have SMP for call termination.

Broadcasting and Content Law

The Audiovisual Media Services Directive (**AVMSD**) governs the activities of broadcasters under E.U. law. The AVMSD is in the process of being transposed by the Member States into their respective national laws. On September 23, 2021, the European Commission warned a number of Member States for being late with the transposition, including Ireland and Slovakia. The Member States in question were required to adopt and notify the relevant measures within two months, which we have not seen to date. The Commission may refer their cases to the Court of Justice of the European Union.

Generally, broadcasts originating in and intended for reception within an E.U. Member State must respect the laws of that Member State. Pursuant to the AVMSD, however, E.U. Member States must allow broadcast signals of broadcasters established in another E.U. Member State to be freely transmitted within their territory, so long as the broadcaster complies with the law of their home state. In addition, when we offer third-party VoD services on our network, it is the third-party provider, and not us as the distributor, that is regulated in respect of these services. The U.K. and Switzerland have regulatory systems that also reflect these principles.

The AVMSD established quotas, applicable to both linear and non-linear services, for the transmission of European-produced programming and programs made by European producers who are independent of broadcasters. Such obligations are applicable to our businesses in the E.U. The U.K. and Switzerland have regulatory systems that similarly reflect these principles.

Member States are also allowed to require service providers to contribute financially to the production of European works, including requiring financial contributions from VoD providers established in other territories that targets audiences in their jurisdiction. Such obligations are applicable to (or are expected to become applicable to) certain of our businesses.

In addition, European Commission regulations mandate that commercial providers of online content services (including OTT service providers) enable subscribers who are temporarily present in any Member State to access and use online content services in substantially the same manner as in their Member State of residence. Our services comply with these portability requirements.

In the U.K., the VMO2 JV is required to hold individual licenses under the Broadcasting Acts 1990 and 1996 for any television channels (including barker channels) that it owns or operates and to provide certain other services on its cable television platform, such as electronic program guides. These television licensable content service (**TLCS**) licenses are granted and administered by the U.K. Office of Communications (**Ofcom**). Under these licenses, each covered service must comply with a number of Ofcom codes, including the Broadcasting Code, and with all of Ofcom's directions. Breach of any of the terms of a TLCS license may result in the imposition of fines and, potentially, license revocation.

As a provider of an on-demand program service (**ODPS**), the VMO2 JV must also comply with a number of statutory obligations in relation to "editorial content" and notify Ofcom of its intention to provide an ODPS. Failure to notify Ofcom or comply with the relevant statutory obligations may result in the imposition of fines or, ultimately, a prohibition on providing an ODPS.

Technological Regulation

The European Commission is increasingly imposing additional mandatory requirements regarding energy consumption of the telecommunications equipment we provide our customers. We have been working to lower power consumption of our set-top boxes. Legislation in this area may be adopted that could adversely affect the cost and/or the functionality of equipment we deploy to customers.

Pursuant to an E.U. Regulation on standby power (the **Standby Regulation**), many devices are required to have either a low power standby mode or off mode, unless such mode is inappropriate for the intended use of the product. In particular, the Standby Regulation sets, among others, the maximum power consumption of networked consumer equipment while in the so-called "Networked Standby" mode. As a result, all of the devices we purchase and/or develop operate under the power management requirements of the Standby Regulation.

Also, the E.U.'s Radio Equipment Directive regulates radio equipment held for sale. It sets essential requirements for safety and health, electromagnetic compatibility and the efficient use of the radio spectrum. This directive also provides the

basis for further regulation governing some additional aspects, including technical features for the protection of privacy, personal data and fraud, interoperability, access to emergency services, and compliance regarding the combination of radio equipment and software. The European Commission recently adopted a delegated act under the Radio Equipment Directive to improve network resilience and better protect consumer's privacy. The delegated act will enter into force during the first quarter of 2022 and will apply beginning on August 1, 2024.

Due to a Mutual Recognition Agreement established between the E.U. and Switzerland, the Standby Regulation and the Radio Equipment Directive also applies in Switzerland. Before Brexit, the U.K. implemented the Standby Regulation and the Radio Equipment Directive into national law.

Through the E.U.'s Radio Spectrum Policy Program, certain spectrum has been approved for mobile broadband use. The terms under which this spectrum becomes available varies among the European countries in which we operate, and certain uses of this spectrum may interfere with services carried on our cable networks. If this occurs, we may need to: (1) avoid using certain frequencies on our cable networks for certain of our services, (2) make some changes to our networks, or (3) change the equipment that we deploy. We are in ongoing discussions with relevant Member States and the European Commission to develop mitigation techniques to reduce some of this interference, but we cannot predict the ultimate outcome of these discussions.

Privacy Regulation

In May 2018, the General Data Protection Regulation (**GDPR**) became effective in the E.U. The GDPR sets strict standards regarding the handling, use and retention of personal data. Organizations that fail to comply face stiff penalties. In addition, in January 2017, the European Commission published a proposal for a new e-Privacy regulation. Negotiations among E.U. Member States are still in process, and we cannot predict the ultimate outcome of these negotiations.

The GDPR applies to the European Economic Area (**EEA**), which includes the E.U. and a number of countries, not including the U.K. or Switzerland. When personal data is transferred outside the EEA, special safeguards stemming from the GDPR, such as the adoption of adequacy decisions and the use of standard contractual clauses (**SCCs**), are enforced to ensure that data is transferred in a protected manner. Adequacy decisions indicate which third countries have in place data protection laws sufficiently similar to those provided under the GDPR. Transfers to an "adequate" third country is compared to a transmission of data within the E.U.

On June 28, 2021, the European Commission adopted an adequacy decision for the U.K., as the U.K.'s data protection system continues to be based on the same GDPR rules that were applicable when the U.K. was a Member State. However, the adequacy decision is subject to a so-called "sunset clause", which establishes the automatic expiration of the decision after four years from its adoption. After that period, the adequacy findings may be renewed if the U.K. continues to ensure an adequate level of data protection.

When a data transfer involves a third country that has not been granted an adequacy decision, our operations must use SCCs. On June 4, 2021, the European Commission issued an implementing decision on new SCCs, applicable as of September 27, 2021. Using standard contractual clauses does not automatically make an international data transfer GDPR compliant. Instead, the parties must perform "transfer impact assessments" in order to address any possible risks in the data transfer and take supplementary measures. The impact assessment takes into account matters such as the circumstances of the transfer, the nature of the parties, the personal data involved and the laws and practices of the country of destination.

A continued flow of personal data from the EEA to Switzerland is ensured by the Swiss Data Protection Act (**DPA**). The Swiss Parliament adopted a revised version of the DPA that provides more transparency regarding the processing of data and strengthens the individual's information rights (e.g., if his/her data is processed in a foreign country).

Other European Regulations

In addition to the industry-specific regimes discussed above, our operating companies must comply with a range of both specific and general legislation concerning cybersecurity and consumer protection, among other matters.

With respect to cybersecurity, in 2016, the E.U. adopted a directive on security of network and information systems (**NIS Directive**), which provides legal measures to boost the overall level of cybersecurity in the E.U. Our operations in the E.U. do not fall under the NIS Directive, but a transposition of the Directive in Ireland and the Netherlands has effectively introduced the NIS Directive concepts into those jurisdictions. In December 2020, the European Commission presented a revised version

of the legislation that seeks to expand the scope of the NIS Directive, adding new sectors, including telecommunication providers. If adopted, more of our operations may become subject to the security requirements of this second NIS Directive.

During 2020, across the E.U. and in the U.K., restrictions related to so-called “high risk vendors” (HRVs) in the telecommunications sector were announced. The E.U. published a “toolbox” for regulating 5G networks, which acknowledges the need for a risk assessment of 5G equipment suppliers and the need for adopting mitigating measures by E.U. governments. Some Member States are addressing security concerns by identifying individual HRVs in advance, whose equipment should be excluded or limited for all network operations in the country. The Swiss government is also considering new draft measures in the field of telecommunications security.

In November 2021, the U.K. government introduced the Telecoms Security Act, which imposes a new security framework on telecommunication providers and give the Secretary of State for Digital, Culture, Media and Sport new powers to direct telecommunication providers to remove HRVs from their networks. Similar legislation has also been adopted in the Netherlands and Belgium.

The Digital Services Act and the Digital Markets Act currently being discussed by the European Parliament do not, as currently contemplated, appear to impact our businesses. However, we cannot predict what the final legislation will say.

Our operating companies are also subject to both national and European level regulations on competition and on consumer protection, which are largely regulated under the Code. For example, while our operating companies may offer their services in bundled packages in European markets, they are sometimes not permitted to make a subscription to one service, such as cable television, conditional upon a subscription to another service, such as telephony. They may also face restrictions on the degree to which they may discount certain products included in the bundled packages.

Belgium

Telenet has been found to have SMP in the wholesale broadband market, obliging it to (1) provide third-party operators with access to the digital television platform (including basic digital video and analog video) and (2) make available to third-party operators a bitstream offer of broadband internet access including fixed voice as an option. The Belgian NRA has imposed monthly wholesale cable resale access prices. These rates are expected to evolve over time due to, among other reasons, broadband capacity usage.

The obligations on Telenet may strengthen its competitors by granting them resale access to Telenet’s network to offer competing products and services notwithstanding Telenet’s substantial historical financial outlays in developing the infrastructure. In addition, any resale access granted to competitors could (1) limit the bandwidth available to Telenet to provide new or expanded products and services to its customers, and (2) adversely impact Telenet’s ability to maintain or increase its revenue and cash flows. The extent of any such adverse impacts ultimately will be dependent on the degree to which competitors take advantage of the resale access of Telenet’s network, the rates that Telenet receives for such access and other competitive factors or market developments.

Joint Venture Entities

United Kingdom

End of Contract Notifications and Annual Best Tariff Notifications. Specific obligations regarding end of contract and annual best tariff notifications are imposed by Ofcom on providers. These require the VMO2 JV to (i) alert customers who are approaching the end of a minimum contract term to the fact that their contract period is coming to an end and to set out the best new price that the VMO2 JV can offer them and (ii) once a year, alert customers who are out of contract to that fact and again confirm the best new price the VMO2 JV can offer them. In both cases, the VMO2 JV must also set out the price available to new customers for an equivalent service offering. These requirements have adversely impacted our and the VMO2 JV’s revenue since their implementation.

Broadband Expansion. The U.K. enacted the Telecommunications Infrastructure (Leasehold Property) Act in March 2021, pursuant to which, among other things, building regulations now require new housing developments to have Gbit capable access. This new legislation comes as a result of the U.K. government’s push to encourage greater investment in new digital infrastructure and deliver FTTH/Gbit capable networks to approximately 85% of U.K. premises by 2025.

The Netherlands

Similar to our other operations, the VodafoneZiggo JV is subject to must carry obligations, including a number of regional and local broadcasting channels, as well as public broadcasting channels.

The Netherlands' NRA, the Autoriteit Consument & Markt (**ACM**) is currently conducting a new market analysis of high-quality wholesale access. On November 18, 2021, the ACM submitted to the European Commission its intended decision to withdraw regulation of the high-quality business telecom services provided over KPN's network. If adopted, the decision will lead to a complete deregulation of the wholesale market in the Netherlands. A final decision of the ACM is expected in 2022.

Available Information

All our filings with the U.S. Securities and Exchange Commission (the **SEC**), including our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as amendments to such filings are available on our internet website free of charge generally within 24 hours after we file such material with the SEC. Our website address is www.libertyglobal.com. The information on our website is not part of this Annual Report and is not incorporated by reference herein.

Item 1A. RISK FACTORS

In addition to the other information contained in this Annual Report, you should consider the following risk factors in evaluating our results of operations, financial condition, business and operations or an investment in the shares of our company.

The risk factors described in this section have been separated into four groups:

- risks that relate to the competition we face and the technology used in our businesses;
- risks that relate to our operating in overseas markets and being subject to foreign regulation;
- risks that relate to certain financial matters; and
- other risks, including risks that, among other things, relate to the obstacles that may be faced by anyone who may seek to acquire us.

Although we describe below and elsewhere in this Annual Report the risks we consider to be the most material, there may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that also could have material adverse effects on our results of operations, financial condition, business or operations in the future. In addition, past financial performance may not be a reliable indicator of future performance and historical trends should not be used to anticipate results or trends in future periods.

If any of the events described below, individually or in combination, were to occur, our businesses, prospects, financial condition, results of operations and/or cash flows could be materially adversely affected.

Factors Relating to Competition and Technology

We operate in increasingly competitive markets, and there is a risk that we will not be able to effectively compete with other service providers. The markets for cable television, broadband internet, telephony and mobile services are highly competitive. In the provision of video services, we face competition from FTA and DTT broadcasters, video provided via satellite platforms, networks using DSL, VDSL or vectoring technology, multi-channel multipoint distribution system operators, FTTx networks, OTT video service providers, and, in some countries where parts of our systems are overbuilt, cable networks, among others. Our operating businesses are facing increasing competition from video services provided by, or over the networks of, incumbent telecommunications operators and other service providers. As the availability and speed of broadband internet increases, we also face competition from OTT video content providers utilizing our or our competitors' high-speed internet connections. In the provision of telephony and broadband internet services, we are experiencing increasing competition from the incumbent telecommunications operators and other service providers in each country in which we operate, as well as providers of mobile voice and data. The incumbent telecommunications operators typically dominate the market for these services and have the advantage of nationwide networks and greater resources than we have to devote to the provision of these services. Many of the incumbent operators offer double-play, triple-play and quadruple-play bundles of services. In many countries, we also compete with other operators using LLU to provide these services, other facilities-based operators and wireless providers. Developments in DSL as well as investments into FTTx technology by the incumbent telecommunications operators and alternative providers have improved the attractiveness of our competitors' products and services and strengthened their competitive position. Developments in wireless technologies, such as 5G and FWA, are creating additional competitive challenges.

In some of our markets, national and local government agencies may seek to become involved, either directly or indirectly, in the establishment of FTTx networks, DTT systems or other communications systems. We intend to pursue available options to restrict such involvement or to ensure that such involvement is on commercially reasonable terms. There can be no assurance, however, that we will be successful in these pursuits. As a result, we may face competition from entities not requiring a normal commercial return on their investments. In addition, we may face more vigorous competition than would have been the case if there were no government involvement.

We expect the level and intensity of competition to continue to increase from both existing competitors and the influx of new market entrants as a result of changes in the regulatory framework of the industries in which we operate, as well as strategic alliances and cooperative relationships among industry participants. Increased competition could result in increased customer churn, reductions of customer acquisition rates for some products and services and significant price and promotional competition in our markets. In combination with difficult economic environments, these competitive pressures could adversely impact our ability to increase or, in certain cases, maintain the revenue, average revenue per RGU or mobile subscriber, as applicable (ARPU), RGUs, mobile subscribers, Adjusted EBITDA (as defined in note 19 to our consolidated financial statements), Adjusted EBITDA margins and liquidity of our operating segments.

Changes in technology may limit the competitiveness of and demand for our services. Technology in the video, telecommunications and data services industries is changing rapidly, including advances in current technologies and the emergence of new technologies. New technologies, products and services may impact consumer behavior and therefore demand for our products and services. The ability to anticipate changes in technology and consumer tastes and to develop and introduce new and enhanced products and services on a timely basis will affect our ability to continue to grow, increase our revenue and number of subscribers and remain competitive. New products and services, once marketed, may not meet consumer expectations or demand, can be subject to delays in development and may fail to operate as intended. A lack of market acceptance of new products and services that we may offer, or the development of significant competitive products or services by others, could have a material adverse impact on our revenue and Adjusted EBITDA.

Our significant property and equipment additions may not generate a positive return. Significant additions to our property and equipment are, or in the future may be, required to add customers to our networks and to upgrade or expand our broadband communications networks and upgrade customer premises equipment to enhance our service offerings and improve the customer experience. Additions to our property and equipment, which are currently underway, require significant capital expenditures for equipment and associated labor costs to build out and/or upgrade our networks as well as for related customer premises equipment. Additionally, significant competition, the introduction of new technologies, the expansion of existing technologies, such as FTTx and advanced DSL technologies, the impact of natural disasters, or adverse regulatory developments could cause us to decide to undertake previously unplanned builds or upgrades of our networks and customer premises equipment.

No assurance can be given that any newbuilds, rebuilds, upgrades or extensions of our network will increase penetration rates, increase average monthly subscription revenue per average cable RGU or mobile subscriber, as applicable, or otherwise

generate positive returns as anticipated, or that we will have adequate capital available to finance such newbuilds, rebuilds, upgrades or extensions. Additionally, costs related to our property and equipment additions could end up being greater than originally anticipated or planned. If this is the case, we may require additional financing sooner than anticipated or we may have to delay or abandon some or all of our development and expansion plans or otherwise forego market opportunities. Additional financing may not be available on favorable terms, if at all, and our ability to incur additional debt will be limited by our debt agreements. If we are unable to, or elect not to, pay for costs associated with adding new customers, expanding, extending or upgrading our networks or making our other planned or unplanned additions to our property and equipment, or are delayed in making such investments, our growth could be limited and our competitive position could be harmed.

We depend almost exclusively on our relationships with third-party programming providers and broadcasters for programming content, and a failure to acquire a wide selection of popular programming on acceptable terms could adversely affect our business. The success of our video subscription business depends, in large part, on our ability to provide a wide selection of popular programming to our subscribers. We generally do not produce our own content and we depend on our agreements, relationships and cooperation with public and private broadcasters, rights holders and collective rights associations to obtain such content. If we fail to obtain a diverse array of popular programming for our pay television services, including a sufficient selection of HD channels as well as non-linear content (such as a selection of attractive VoD content) and rights for ancillary services such as DVR and catch up or 'Replay' services, on satisfactory terms, we may not be able to offer a compelling video product to our customers at a price they are willing to pay. Additionally, we are frequently negotiating and renegotiating programming agreements and our annual costs for programming can vary. There can be no assurance that we will be able to renegotiate or renew the terms of our programming agreements on acceptable terms or at all. There has also been a rise in the number of direct-to-consumer offerings from content owners which impacts negotiations and the content, rights available and restrictions imposed on us. Programming and copyright costs represent a significant portion of our operating costs and are subject to rise in future periods due to various factors, including (1) higher costs associated with the expansion of our digital video content, including rights associated with ancillary product offerings and rights that provide for the broadcast of live sporting events and (2) rate increases.

If we are unable to obtain or retain attractively priced competitive content, demand for our existing and future video services could decrease, thereby limiting our ability to attract new customers, maintain existing customers and/or migrate customers from lower-tier programming to higher-tier programming, thereby inhibiting our ability to execute our business plans. Furthermore, we may be placed at a competitive disadvantage if certain of our competitors obtain exclusive programming rights, particularly with respect to popular sports and movie programming, and as certain players in the OTT market, for example Netflix, Amazon and Disney, increasingly produce their own exclusive content.

We depend on third-party suppliers and licensors to supply necessary equipment, software and certain services required for our businesses. We rely on third-party vendors for the equipment, software and services that we require in order to provide services to our customers. Our suppliers often conduct business worldwide and their ability to meet our needs is subject to various risks, including political and economic instability, natural calamities, interruptions in transportation or supply chain systems, terrorism and labor issues. As a result, we may not be able to obtain the equipment, software and services required for our businesses on a timely basis or on satisfactory terms. Any shortfall in customer premises equipment could lead to delays in completing extensions to our networks and in connecting customers to our services and, accordingly, could adversely impact our ability to maintain or increase our RGUs, revenue and cash flows. Also, if demand exceeds the suppliers' and licensors' capacity or if they experience financial difficulties, the ability of our businesses to provide some services may be materially adversely affected, which in turn could affect our businesses' ability to attract and retain customers. We have experienced certain business disruptions due to the worldwide silicon shortage, which has increased the delivery lead times and pricing of certain of our key components. We cannot predict how long such shortages will continue or what future disruptions to our business. Although we actively monitor the creditworthiness of our key third-party suppliers and licensors, the financial failure of a key third-party supplier or licensor could disrupt our operations and have an adverse impact on our revenue and cash flows. We rely upon intellectual property that is owned or licensed by us to use various technologies, conduct our operations and sell our products and services. Legal challenges could be made against our use of our or our licensed intellectual property rights (such as trademarks, patents and trade secrets) and we may be required to enter into licensing arrangements on unfavorable terms, incur monetary damages or be enjoined from use of the intellectual property rights in question.

Spectrum cost and availability and regulation may adversely affect our business, financial condition and operating results. As we continue to enhance the quality of our services in certain geographic areas and deploy new technologies, including 5G, we may need to acquire additional spectrum in the future. As a result, we will continue to actively seek to make additional investment in spectrum, which could be significant.

The continued interest in, and acquisition of, spectrum by existing carriers and others may reduce our ability to acquire, and increase the acquisition cost of, spectrum in the secondary market or negatively impact our ability to gain access to spectrum

through other means, including government auctions. Our return on investment in spectrum depends on our ability to attract additional customers and to provide additional services and usage to existing customers. Additionally, applicable regulatory bodies may not be able to provide sufficient additional spectrum to auction. We may also be unable to secure the spectrum necessary to maintain or enhance our competitive position in auctions or in the secondary market, on favorable terms or at all.

Certain regulatory bodies may impose conditions on the acquisition, and use of, new wireless broadband mobile spectrum that may negatively impact our ability to obtain spectrum economically or in appropriate configurations or coverage areas.

If we cannot acquire needed spectrum, if competitors acquire spectrum that allows them to provide competitive services or if we cannot deploy services over acquired spectrum on a timely basis without burdensome conditions, at reasonable costs, and while maintaining network quality levels, our ability to attract and retain customers and our business, financial condition and operating results could be materially adversely affected.

Certain of our businesses that offer mobile telephony and data services rely on the radio access networks of third-party wireless network providers to carry our mobile communications traffic. Our services to mobile customers in many jurisdictions in which we operate rely on the use of MVNO arrangements in which we utilize the radio access networks of third-party wireless network providers to carry our mobile communications traffic. If any of our MVNO arrangements are terminated, or if the respective third-party wireless network provider fails to provide the services required under an MVNO arrangement, or if a third-party wireless network provider fails to deploy and maintain its network, and we are unable to find a replacement network operator on a timely and commercially reasonable basis or at all, we could be prevented from continuing the mobile services relying on such MVNO arrangement. Additionally, as our MVNO arrangements come to term, we may not be able to renegotiate renewal or replacement MVNO arrangements on the same or more favorable terms.

Failure in our or third-party technology or telecommunications systems, leakage of sensitive customer data, or security breaches could significantly disrupt our operations, reduce our customer base and result in fines, litigation or lost revenue. Our success depends, in part, on the continued and uninterrupted performance of our information technology and network systems, including internet sites, data hosting and processing facilities and other hardware, software and technical applications and platforms, as well as our customer service centers. Some of these are managed, hosted, provided or used by third-party service providers or their vendors, to assist in conducting our business. In addition, the hardware supporting a large number of critical systems for our cable network in a particular country or geographic region is housed in a relatively small number of locations. Our and our third-party service providers' systems and equipment (including our routers and set-top boxes) are vulnerable to damage or security breach from a variety of sources, including telecommunications failures, power loss, malicious human acts, security flaws, and natural disasters. Moreover, despite security measures, unauthorized parties may gain access to or disrupt our or our third-party service providers' servers, systems and equipment by, among other things, hacking into our servers, systems and equipment or those of our third-party service providers through fraud, computer viruses, worms, phishing, physical or electronic break-ins or burglaries, or errors by our or our third-party service providers' employees. We and our third-party service providers may not be able to anticipate or respond in an adequate and timely manner to attempts to obtain authorized access to, disable or degrade our or our third-party service providers' systems because the techniques for doing so change frequently, are increasingly complex and sophisticated and are difficult to detect for periods of time. In addition, as discussed further below, the security measures and procedures we and our third-party service providers have in place to protect personal data and other information may not be sufficient to counter all data security breaches, cyber-attacks or system failures. In some cases, mitigation efforts may depend on third parties who may not deliver products or services that meet the required contractual standards or whose hardware, software or network services may be subject to error, defect, delay or outage.

Through our operations, sales and marketing activities, we collect and store certain personal information related to our customers. This may include phone numbers, drivers license numbers, contact preferences, personal information stored on electronic devices and payment information, including credit and debit card data. We also gather and retain information about employees in the normal course of business. In certain circumstances, where it is lawful to do so, we may share information about such persons with third-party service providers that assist with certain aspects of our business. Unauthorized parties may attempt to gain access to such data and information using the same methods described in the prior paragraph. As a result, data and information we gather could be subject to misappropriation, misuse, leakage, falsification or accidental release or loss of information maintained in our information technology systems and networks and those of our third-party service providers, including customer and personnel data. As a result of the increasing awareness concerning the importance of safeguarding personal information, the potential misuse of such information and legislation that has been adopted or is being considered across all of our markets regarding the protection, privacy and security of personal information, information-related risks are increasing, particularly for businesses like ours that handle a large amount of personal data. Failure to comply with these data protection laws may result in, among other consequences, fines, litigation or regulatory actions by state, federal or non-U.S. authorities.

Despite the precautions we have taken, unanticipated problems affecting our systems and equipment could cause business disruptions such as failures in our information technology systems, disruption in the transmission of signals over our networks, unauthorized access to the data and information we gather or similar problems. Further, although we devote significant resources to our cybersecurity programs and have implemented security measures to protect our systems and data, and to prevent, detect and respond to data security incidents, there can be no assurance that our efforts will prevent these threats. Any disruptive situation that causes loss, misappropriation, misuse or leakage of data could damage our reputation and the credibility of our operations and could subject us to potential liability, including litigation or other legal actions against us, the imposition of penalties, fines, fees or liabilities, which may not be covered by our insurance policies, and lost customers and revenue. While we maintain cyber liability insurance that provides both third-party liability and first-party liability insurance coverage, such insurance may not be sufficient to protect against all of our businesses' losses from any future disruptions or breaches of their systems or other events as described above. Also, a cybersecurity breach and the changing cybersecurity landscape could require us to devote significant management resources to address the problems associated with the breach and to expend significant additional resources to upgrade further the security measures we employ to protect customer, employee and other personal information against cyber-attacks and other wrongful attempts to access such information, which could result in a disruption of our operations. This includes additional infrastructure capacity spending to mitigate any system degradation and the reallocation of resources from development activities. To date, other than the non-permitted access of one of Virgin Media's databases in February of 2020, we have not been subject to cyberattacks or network disruptions that, individually or in the aggregate, have been material to our operations or financial condition. Although we have not detected another material security breach or cybersecurity incident to date, we have been the target of events of this nature and expect to be subject to similar attacks in the future.

Factors Relating to Operations and Regulation

Our businesses are conducted almost exclusively outside of the U.S., which gives rise to numerous operational risks. Our businesses operate almost exclusively in countries outside the U.S. and are thereby subject to the following inherent risks:

- fluctuations in foreign currency exchange rates;
- difficulties in staffing and managing international operations;
- potentially adverse tax consequences;
- export and import restrictions, custom duties, tariffs and other trade barriers;
- increases in taxes and governmental fees;
- economic and political instability; and
- changes in foreign and domestic laws and policies that govern operations of foreign-based companies.

Operational risks that we may experience in certain countries include disruptions of services or loss of property or equipment that are critical to overseas businesses due to expropriation, nationalization, war, insurrection, terrorism or general social or political unrest.

We are exposed to foreign currency exchange rate risk. We are exposed to foreign currency exchange rate risk with respect to our consolidated debt in situations where our debt is denominated in a currency other than the functional currency of the operations whose cash flows support our ability to repay or refinance such debt. Although we generally match the denomination of our and our subsidiaries' borrowings with the functional currency of the operations that are supporting the respective borrowings, market conditions or other factors may cause us to enter into borrowing arrangements that are not denominated in the functional currency of the underlying operations (unmatched debt). In these cases, our policy is to provide for an economic hedge against foreign currency exchange rate movements by using derivative instruments to synthetically convert unmatched debt into the applicable underlying currency. At December 31, 2021, substantially all of our debt was either directly or synthetically matched to the applicable functional currencies of the underlying operations.

In addition to the exposure that results from the mismatch of our borrowings and underlying functional currencies, we are exposed to foreign currency risk to the extent that we enter into transactions denominated in currencies other than our or our subsidiaries' respective functional currencies (non-functional currency risk), such as equipment purchases, programming contracts, notes payable and notes receivable (including intercompany amounts). Changes in exchange rates with respect to amounts recorded on our consolidated balance sheets related to these items will result in unrealized (based upon period-end exchange rates) or realized foreign currency transaction gains and losses upon settlement of the transactions. Moreover, to the

extent that our revenue, costs and expenses are denominated in currencies other than our respective functional currencies, we will experience fluctuations in our revenue, costs and expenses solely as a result of changes in foreign currency exchange rates. Generally, we will consider hedging non-functional currency risks when the risks arise from agreements with third parties that involve the future payment or receipt of cash or other monetary items to the extent that we can reasonably predict the timing and amount of such payments or receipts and the payments or receipts are not otherwise hedged. In this regard, we have entered into foreign currency forward contracts to hedge certain of these risks. For additional information concerning our foreign currency forward contracts, see note 8 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

We are also exposed to unfavorable and potentially volatile fluctuations of the U.S. dollar (our reporting currency) against the currencies of our operating subsidiaries when their respective financial statements are translated into U.S. dollars for inclusion in our consolidated financial statements. Cumulative translation adjustments are recorded in accumulated other comprehensive earnings or loss as a separate component of equity. Any increase (decrease) in the value of the U.S. dollar against any foreign currency that is the functional currency of one of our operating subsidiaries will cause us to experience unrealized foreign currency translation losses (gains) with respect to amounts already invested in such foreign currencies. Accordingly, we may experience a negative impact on our comprehensive earnings or loss and equity with respect to our holdings solely as a result of foreign currency translation. Our primary exposure to foreign currency translation risk during the three months ended December 31, 2021 was to the euro and Swiss franc, as 55.2% and 43.7% of our reported revenue during such period was derived from subsidiaries whose functional currencies are the euro and Swiss franc, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for other local currencies in Europe. We do not hedge against the risk that we may incur non-cash losses upon the translation of the financial statements of our subsidiaries and affiliates into U.S. dollars.

Our businesses are subject to risks of adverse regulation. Our businesses are subject to the unique regulatory regimes of the countries in which they operate. Video distribution, broadband internet, telephony and mobile services are subject to licensing or registration eligibility rules and regulations, which vary by country. Countries in which we operate may adopt laws and regulations regarding electronic commerce, which could dampen the growth of the internet services being offered and developed by our businesses. In a number of countries, our ability to increase prices for, or change our services, including the programming packages we offer is limited by regulation or conditions imposed by competition authorities or is subject to review by regulatory authorities or is subject to termination rights of customers. More significantly, regulatory authorities may require us, particularly if we are deemed to possess SMP, to grant third parties access to our networks, facilities or services to distribute their own services or resell our services to end customers. Consequently, our businesses must adapt their ownership and organizational structures as well as their pricing and service offerings to satisfy the rules and regulations to which they are subject. A failure to comply with applicable rules and regulations could result in penalties, restrictions on our business, loss of required licenses or other adverse conditions.

Adverse changes in rules and regulations could:

- impair our ability to use our networks in ways that would generate maximum revenue and Adjusted EBITDA;
- create a shortage of capacity on our networks, which could limit the types and variety of services we seek to provide our customers;
- impact our ability to access spectrum for our mobile services;
- strengthen our competitors by granting them access and lowering their costs to enter into our markets; and
- significantly and adversely impact our results of operations.

Businesses, including ours, that offer multiple services, such as video distribution as well as internet, telephony, and/or mobile services, or that are vertically integrated and offer both video distribution and programming content, often face close regulatory scrutiny from competition authorities. This is particularly the case with respect to any proposed business combinations, which often require clearance from the European Commission or national competition authorities, which can block, impose conditions on, or delay, an acquisition, thus possibly hampering our opportunities for growth. In the event conditions are imposed and we fail to meet them in a timely manner, the relevant authority may impose fines and, if in connection with a merger transaction, may require restorative measures, such as a mandatory disposition of assets or divestiture of operations.

For information regarding certain other regulatory developments that could adversely impact our results of operations in future periods, see *Legal and Regulatory Proceedings and Other Contingencies* in note 18 to our consolidated financial statements.

New and existing legislation may significantly alter the regulatory regimes applicable to us, which could adversely affect our competitive position and profitability, and we may become subject to more extensive regulation, particularly if we are deemed to possess significant market power in any of the markets in which we operate. Significant changes to the existing regulatory regimes applicable to the provision of video, telephony, internet and mobile services have been and are still being introduced. For example, in the E.U., the Code is the primary source of communications regulation affecting our E.U. businesses, including access, user and privacy rights, video must-carry services and our competitive activities. In addition, we are subject to regular review by national regulatory authorities concerning whether we exhibit SMP. A finding of SMP can result in our company becoming subject to open access, pricing and other requirements that could potentially advantage our competitors. This has resulted, for example, in obligations with respect to call termination for our telephony business in Europe and video and broadband internet access obligations in Belgium.

The U.K.'s departure from the E.U. could have a material adverse effect on our business, financial condition, results of operations or liquidity. The U.K. formally exited the E.U. on January 31, 2020, and on December 24, 2020, entered into the "Trade and Cooperation Agreement", referred to as the "**E.U.-U.K. Agreement**". For more information regarding the E.U.-U.K. Agreement, see *Item 1. Business - Regulatory Matters - Overview* discussion above. Examples of the potential impact Brexit could have on our business, financial condition or results of operations include:

- changes in foreign currency exchange rates and disruptions in the capital markets. For example, a sustained period of weakness in the British pound sterling or the euro could have an adverse impact on our liquidity, including our ability to fund repurchases of our equity securities and other U.S. dollar-denominated liquidity requirements;
- shortages of labor necessary to conduct our business;
- disruption to our U.K. supply chain and related increased cost of supplies;
- a weakened U.K. economy resulting in decreased consumer demand for our products and services in the U.K.;
- legal uncertainty, increased compliance costs and potentially divergent national laws and regulations as the U.K. determines which E.U. laws and directives to replace or replicate, or where previously implemented by enactment of U.K. laws or regulations, to retain, amend or repeal; and
- various geopolitical forces may impact the global economy and our business, including, for example, other E.U. member states (in particular those member states where we have operations) proposing referendums to, or electing to, exit the E.U.

We cannot be certain that we will be successful with respect to acquisitions, dispositions, joint ventures, partnerships or other similar transactions, or that we will achieve the anticipated benefits thereof. Historically, our businesses have grown, in part, through selective acquisitions that enabled them to take advantage of existing networks, local service offerings and region-specific management expertise, and we have also taken advantage of attractive opportunities to sell select businesses and partner with others. We expect to seek to continue improving our company through attractive acquisitions, dispositions, joint ventures, partnerships or other similar transactions in selected markets, such as the SFR BeLux acquisition in June 2017, the De Vijver Media acquisition in June 2019, the UPC Austria disposition in July 2018, the sales of the operations of UPC DTH and the Vodafone Disposal Group in May 2019 and July 2019, respectively, the Sunrise Acquisition in November 2020 and the anticipated sale of UPC Poland, as well as the formations of the Atlas Edge JV and the VMO2 JV in September and June of 2021, respectively. Our ability to complete any transaction may be limited by many factors, including government regulation, availability of financing, our or our counterparty's debt covenants, the prevalence of complex ownership structures among potential targets, acquirers, joint ventures or partners, disapproval by shareholders of potential targets or acquirers, and competition from other potential acquirers, including private equity funds. Even if we are successful in completing such transactions, integration and separation activities may present significant costs and challenges. We cannot be assured that we will be successful with respect to acquisitions, dispositions, joint ventures, partnerships or other similar transactions or realizing the anticipated benefits thereof.

In addition, we anticipate that most, if not all, companies acquired by us will be located outside the U.S. Foreign companies may not have disclosure controls and procedures or internal controls over financial reporting that are as thorough or effective as those required by U.S. securities laws and applicable accounting rules. While we intend to conduct appropriate due diligence

and to implement appropriate controls and procedures as we integrate acquired companies, we may not be able to certify as to the effectiveness of these companies' disclosure controls and procedures or internal controls over financial reporting until we have fully integrated them.

The expected synergies and benefits from our acquisitions and joint ventures may not be realized in the amounts anticipated or may not be realized within the expected time frame, and risks associated with the foregoing may also result from the extended delay in the integration of the companies. Our ability to realize the anticipated benefits of our acquisitions and joint ventures will depend, to a large extent, on our ability to integrate our businesses and the acquired or joint venture company's business in a manner that facilitates growth opportunities and achieves the projected cost savings. In addition, some of the anticipated synergies are not expected to occur for some time following the completion of such acquisitions and joint ventures and will require substantial capital expenditures before realizing some of those synergies.

The COVID-19 pandemic may delay, reduce or eliminate some of our anticipated synergies and other benefits, including a delay in the integration of, or inability to integrate, the business that we acquire or partner with. Even if we are able to integrate successfully, the anticipated benefits of such transactions, including the expected synergies and network benefits, may not be realized fully or at all or may take longer to realize than expected.

We have incurred substantial expenses as a result of completing our various acquisitions and joint ventures. We expect that substantial additional expenses will need to be incurred in order to integrate the businesses, operations, policies, and procedures. While we have assumed that a certain level of transaction-related expenses will be incurred, factors beyond our control could affect the total amount or the timing of these expenses. Many of the expenses that will be incurred, by their nature, are difficult to estimate accurately. These expenses could exceed the costs historically borne by us and offset, in whole or in part, the expected synergies.

Our integration efforts may not be executed successfully, or such integration may be more difficult, time consuming or costly than expected. Operating costs, customer loss and business disruption, including maintaining relationships with employees, customers, suppliers or vendors, may be greater than expected. The combination of independent businesses is complex, costly and time-consuming, and may divert significant management attention and resources. This process may disrupt our business or otherwise impact our ability to compete. The overall combination of our and the businesses of those companies that we acquire or partner with may also result in material unanticipated problems, expenses, liabilities, competitive responses and impacts and loss of customers and other business relationships. The difficulties of combining the operations of the companies include, among others:

- diversion of management attention to integration matters;
- difficulties in integrating operations and systems, including intellectual property and communications systems, administrative and information technology infrastructure, and supplier and vendor arrangements, including as a result of the COVID-19 pandemic;
- challenges in conforming standards, controls, procedures and accounting and other policies;
- alignment of key performance measurements may result in a greater need to communicate and manage clear expectations while we work to integrate and align policies and practices;
- difficulties in integrating employees;
- the transition of management to the combined company management team, and the need to address possible differences in corporate cultures, management philosophies, and compensation structures;
- challenges in retaining existing customers and obtaining new customers;
- compliance with government regulations
- known or potential unknown liabilities of the acquired businesses that are larger than expected; and
- other potential adverse consequences and unforeseen increased expenses or liabilities associated with the applicable transaction.

Additionally, uncertainties over the integration process could cause customers, suppliers, distributors, dealers, retailers and others to seek to change or cancel our existing business relationships or to refuse to renew existing relationships. Suppliers, distributors and content and application providers may also delay or cease developing new products for us that are necessary for

the operations of our business due to uncertainties or lack of available resources. Competitors may also target our existing customers by highlighting potential uncertainties and integration difficulties.

Some of these factors are outside our control, and any one of them could result in lower revenues, higher costs and diversion of management time and energy, which could adversely impact our business, financial condition and operating results. In addition, even if the integration is successful, the full benefits of our acquisitions and partnerships including, among others, the synergies, cost savings or sales or growth opportunities may not be realized. As a result, it cannot be assured that we will realize the full benefits expected from such transactions within the anticipated time frames or at all.

Certain operations are conducted by joint ventures that we cannot operate solely for our benefit. Certain of our operations, particularly the VMO2 JV in the U.K. and the VodafoneZiggo JV in the Netherlands, are conducted through joint ventures or partnerships. We share ownership and management of these joint venture with one or more parties who may or may not have the same goals, strategies, priorities or resources as we do. In general, joint ventures are intended to be operated for the benefit of all co-owners, rather than for our exclusive benefit. Operating a business as a joint venture often requires additional organizational formalities as well as time-consuming procedures for sharing information, accounting and making decisions. In certain cases, our joint venture partners must agree in order for the applicable joint venture to take certain actions. Our inability to take unilateral action that we believe is in our best interests may have an adverse effect on the financial performance of the joint venture and the return on our investment. In joint ventures, we believe our relationship with our co-owners is an important factor to the success of the joint venture, and if a co-owner changes, our relationship may be adversely affected. In addition, the benefits from a successful joint venture are shared among the co-owners, so that we do not receive all the benefits from our successful joint ventures.

Our interests in the VodafoneZiggo JV and the VMO2 JV are held pursuant to Shareholder Agreements that contain provisions relating to governance as well as transfer and exit rights, which, depending on the circumstances, may not be in the best interest of our company. Our non-controlling interests in the VodafoneZiggo JV and the VMO2 JV are held pursuant to shareholders' agreements (each a **Shareholders' Agreement**), which provides the terms of the governance of the VodafoneZiggo JV and the VMO2 JV, as applicable, including among others, decision-making process, information access, dividend policy and non-compete provisions. These provisions may prevent the VodafoneZiggo JV or the VMO2 JV, as applicable from making decisions or taking actions that would protect or advance the interests of our company, and could even result in the VodafoneZiggo JV or the VMO2 JV, as applicable, making decisions or taking actions that adversely impact our company. Further, our ability to access the cash of the VodafoneZiggo JV or the VMO2 JV, as applicable, pursuant to the dividend policy contained in the Shareholders' Agreements may be restricted in certain circumstances. The Shareholders' Agreements also provide for restrictions on the transfer of interests in the VodafoneZiggo JV and the VMO2 JV, as applicable, which could adversely affect our ability to sell our interest in the VodafoneZiggo JV or the VMO2 JV, as applicable, and/or the prices at which our interest may be sold, as well as certain exit arrangements, which could force us to sell our interest. For additional information on the VodafoneZiggo JV or the VMO2 JV and their respective Shareholders' Agreement, see note 7 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

We may have exposure to additional tax liabilities. We are subject to income taxes as well as non-income based taxes, such as value added tax (**VAT**) in the U.K., the U.S. and many other jurisdictions around the world. In addition, most tax jurisdictions that we operate in have complex and subjective rules regarding the valuation of intercompany services, cross-border payments between affiliated companies and the related effects on income tax, VAT and transfer tax. Significant judgment is required in determining our worldwide provision for income taxes and other tax liabilities. In the ordinary course of our business, there are many transactions and calculations where the ultimate tax determination is uncertain. We are regularly under audit by tax authorities in many of the jurisdictions in which we operate. These audits may lead to disputes with tax authorities which may result in litigation. Although we believe that our tax estimates are reasonable, any material differences as a result of final determinations of tax audits or tax disputes could have an adverse effect on our financial position and results of operations in the period or periods for which such determination is made.

We are subject to changing tax laws, treaties and regulations in and between countries in which we operate, including treaties between and among the U.K., the U.S. and many other jurisdictions in which we have a presence. Also, various income tax proposals in the jurisdictions in which we operate could result in changes to the existing laws on which our deferred taxes are calculated. A change in these tax laws, treaties or regulations, or in the interpretation thereof, could result in a materially higher income or non-income tax expense, and any such material changes could cause a material change in our effective tax rate. In this regard, there have been significant changes or proposed changes to the tax laws in numerous jurisdictions in which we operate, the impacts of which have been reflected accordingly in our financial statements.

Further changes in the tax laws of the foreign jurisdictions in which we operate could arise as a result of the Base Erosion and Profit Shifting (**BEPS**) project undertaken by the Organizational Economic Cooperation and Development (**OECD**). The

OECD represents a coalition of member countries that encompass most of the jurisdictions in which we operate. In October 2021, the OECD announced the OECD/G20 Inclusive Framework of Base Erosion and Profit Shifting (the **Framework**), which agreed to a two-pillar solution to reform international taxation. Pillar One provides a mechanism to align taxing rights more closely with local market engagement; generally, where people or consumers are located. Pillar Two establishes a global minimum tax regime through a series of interlocking rules that would apply when a country's income tax rate is below 15%. The Framework targets a 2023 effective date for most aspects of both pillars, with OECD and G2 members enacting laws consistent with Pillar Two in 2022. It is possible that jurisdictions in which we do business could react to the BEPS initiatives or their own concerns by enacting tax legislation that could adversely affect our financial position through increasing our tax liabilities. Further, the BEPS project as well as legislative changes in many countries, has resulted in various initiatives that require the sharing of company financial and operation information with taxing authorities on a local or global basis. This may lead to greater audit scrutiny of profits earned in other countries as well as disagreements between jurisdictions associated with the proper allocation of profits between jurisdictions.

The "Virgin" brand is used by certain of our consolidated and non-consolidated subsidiaries under licenses from Virgin Enterprises Limited and is not under the control of such subsidiaries. The activities of the group of companies utilizing the "Virgin" brand and other licensees could have a material adverse effect on the goodwill of customers towards our business as a licensee and the licenses from Virgin Enterprises Limited can be terminated in certain circumstances. The "Virgin" brand is integral to the corporate identity of our consolidated and non-consolidated subsidiaries that utilize such brand. Such subsidiaries are reliant on the general goodwill of consumers towards the Virgin brand. Consequently, adverse publicity in relation to the group of companies utilizing the "Virgin" brand or its principals, particularly Sir Richard Branson, who is closely associated with the brand, or in relation to another licensee of the "Virgin" name and logo (particularly in the U.K., where the VMO2 JV does business) could have a material adverse effect on our reputation and our business and results of operations. In addition, the licenses from Virgin Enterprises Limited can be terminated in certain circumstances. For example, Virgin Enterprises Limited can terminate the licenses, after providing our applicable subsidiaries with an opportunity to cure, (1) if they or any of their affiliates commit persistent and material breaches or flagrant and material breaches of the licenses, (2) if Virgin Enterprises Limited has reasonable grounds to believe that the use (or lack of use) of the licensed trademarks by such subsidiaries has been or is likely to result in a long-term and material diminution in the value of the "Virgin" brand, or (3) if a third-party who is not (or one of whose directors is not) a "fit and proper person", such as a legally disqualified director or a bankrupt entity, acquires "control" of Liberty Global. Such a termination could have a material adverse effect on our business and results of operations.

Factors Relating to Certain Financial Matters

Our substantial leverage could limit our ability to obtain additional financing and have other adverse effects. We seek to maintain our debt at levels that provide for attractive equity returns without assuming undue risk. In this regard, we generally seek to cause our operating subsidiaries to maintain their debt at levels that result in a consolidated debt balance that is between four and five times our consolidated Adjusted EBITDA. As a result, we are highly leveraged. At December 31, 2021, the outstanding principal amount of our consolidated debt, together with our finance lease obligations aggregated \$14.9 billion, including \$0.9 billion that is classified as current on our consolidated balance sheet and \$13.7 billion that is not due until 2027 or thereafter. We believe that we have sufficient resources to repay or refinance the current portion of our debt and finance lease obligations and to fund our foreseeable liquidity requirements during the next 12 months. However, as our maturing debt grows in later years, we anticipate that we will seek to refinance or otherwise extend our debt maturities. In this regard, we completed refinancing transactions during 2021 that, among other things, resulted in the extension of certain of our subsidiaries' debt maturities. No assurance can be given that we will be able to complete these refinancing transactions or otherwise extend our debt maturities. In this regard, it is not possible to predict how political and economic conditions, sovereign debt concerns or any adverse regulatory developments could impact the credit and equity markets we access and, accordingly, our future liquidity and financial position.

Our ability to service or refinance our debt and to maintain compliance with the leverage covenants in the credit agreements and indentures of our borrowing groups is dependent primarily on our ability to maintain or increase the Adjusted EBITDA of our operating subsidiaries and to achieve adequate returns on our property and equipment additions and acquisitions. In addition, our ability to obtain additional debt financing is limited by the incurrence-based leverage covenants contained in the various debt instruments of our borrowing groups. For example, if the Adjusted EBITDA of one of our borrowing groups were to decline, our ability to obtain additional debt could be limited. Accordingly, if our cash provided by operations declines or we encounter other material liquidity requirements, we may be required to seek additional debt or equity financing in order to meet our debt obligations and other liquidity requirements as they come due. In addition, our current debt levels may limit our ability to incur additional debt financing to fund working capital needs, acquisitions, property and equipment additions, or other general corporate requirements. We can give no assurance that any additional debt or equity financing will be available on terms that are as favorable as the terms of our existing debt or at all. Further, our board of

directors has approved share repurchase programs for Liberty Global. Any cash used by our company in connection with any future repurchases of our ordinary shares would not be available for other purposes, including the repayment of debt. For additional information concerning our share repurchase programs, see note 14 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

Certain of our subsidiaries are subject to various debt instruments that contain restrictions on how we finance our operations and operate our businesses, which could impede our ability to engage in beneficial transactions. Certain of our subsidiaries are subject to significant financial and operating restrictions contained in outstanding credit agreements, indentures and similar instruments of indebtedness. These restrictions will affect, and in some cases significantly limit or prohibit, among other things, the ability of those subsidiaries to:

- incur or guarantee additional indebtedness;
- pay dividends or make other upstream distributions;
- make investments;
- transfer, sell or dispose of certain assets, including subsidiary stock;
- merge or consolidate with other entities;
- engage in transactions with us or other affiliates; or
- create liens on their assets.

As a result of restrictions contained in these debt instruments, the companies party thereto, and their subsidiaries, could be unable to obtain additional capital in the future to:

- fund property and equipment additions or acquisitions that could improve their value;
- meet their loan and capital commitments to their business affiliates;
- invest in companies in which they would otherwise invest;
- fund any operating losses or future development of their business affiliates;
- obtain lower borrowing costs that are available from secured lenders or engage in advantageous transactions that monetize their assets; or
- conduct other necessary or prudent corporate activities.

In addition, most of the credit agreements to which these subsidiaries are parties include financial covenants that require them, in certain circumstances, to maintain certain leverage ratios if the drawings under the applicable revolving credit facility exceed a certain percentage of the commitments under such revolving credit facility. Their ability to meet these financial covenants may be affected by adverse economic, competitive, or regulatory developments and other events beyond their control, and we cannot assure you that these financial covenants will be met. In the event of a default under such subsidiaries' credit agreements or indentures, the lenders or bondholders, as applicable, may accelerate the maturity of the indebtedness under those agreements or indentures, which could result in a default under other outstanding credit facilities or indentures. We cannot assure you that any of these subsidiaries will have sufficient assets to repay indebtedness outstanding under their credit agreements and indentures. Any refinancing of this indebtedness is likely to contain similar restrictive covenants.

We are exposed to interest rate risks. Shifts in such rates may adversely affect the debt service obligation of our subsidiaries. We are exposed to the risk of fluctuations in interest rates, primarily through the credit facilities of certain of our subsidiaries, which are indexed to EURIBOR, LIBOR or other base rates. Although we enter into various derivative transactions to manage exposure to movements in interest rates, there can be no assurance that we will be able to continue to do so at a reasonable cost or at all. If we are unable to effectively manage our interest rate exposure through derivative transactions, any increase in market interest rates would increase our interest rate exposure and debt service obligations, which would exacerbate the risks associated with our leveraged capital structure.

In July 2017, the U.K. Financial Conduct Authority (the authority that regulates LIBOR) announced that it intends to stop compelling banks to submit rates for the calculation of LIBOR after 2021. Additionally, the European Money Markets Institute (the authority that administers EURIBOR) announced that measures would need to be undertaken by the end of 2021 to reform EURIBOR to ensure compliance with the E.U. Benchmarks Regulation. In November 2020, ICE Benchmark Administration

(the entity that administers LIBOR) announced its intention to continue publishing USD LIBOR rates until June 30, 2023, with the exception of the one-week and two-month rates which, along with all CHF and GBP LIBOR rates, it ceased to publish after December 31, 2021. While this extension allows additional runway on existing contracts using USD LIBOR rates, companies are still encouraged to transition away from using USD LIBOR as soon as practicable and should not enter into new contracts that use USD LIBOR after 2021. The methodology for EURIBOR has been reformed and EURIBOR has been granted regulatory approval to continue to be used. Currently, there is no consensus amongst loan borrowers and investors for what rate(s) should replace USD LIBOR.

In October 2020, the International Swaps and Derivatives Association (the **ISDA**) launched the Fallback Supplement, which, as of January 25, 2021, amended the standard definitions for interest rate derivatives to incorporate fallbacks for derivatives linked to certain key interbank offered rates (**IBORs**). The ISDA also launched the Fallback Protocol, a protocol that enables market participants to incorporate these revisions into their legacy non-cleared derivatives with other counterparties that choose to adhere to the protocol. The fallbacks for a particular currency apply following a permanent cessation of the IBOR in that currency, or in the case of a LIBOR setting, that LIBOR setting becoming permanently unrepresentative, and are adjusted versions of the risk-free rates identified in each currency. Our credit agreements contain provisions that contemplate alternative calculations of the base rate applicable to our LIBOR-indexed and EURIBOR-indexed debt to the extent LIBOR or EURIBOR (as applicable) are not available, which alternative calculations we do not anticipate will be materially different from what would have been calculated under LIBOR or EURIBOR (as applicable). Additionally, no mandatory prepayment or redemption provisions would be triggered under our credit agreements in the event that either the LIBOR rate or the EURIBOR rate is not available. It is possible, however, that any new reference rate that applies to our LIBOR-indexed or EURIBOR-indexed debt could be different from any new reference rate that applies to our LIBOR-indexed or EURIBOR-indexed derivative instruments. For discontinued currencies and tenors, we expect to continue taking steps to mitigate the changes in these benchmark rates, including by amending existing credit agreements and adhering to the Fallback Protocol, where appropriate. We plan to continue to manage this difference and any resulting increased variable-rate exposure through modifications to our debt and/or derivative instruments, however future market conditions may not allow immediate implementation of desired modifications and our subsidiaries may incur significant associated costs.

We are subject to increasing operating costs and inflation risks, which may adversely affect our results of operations. While our operations attempt to increase our subscription rates to offset increases in programming and operating costs, there is no assurance that they will be able to do so. In certain countries in which we operate, our ability to increase subscription rates is subject to regulatory controls. Also, our ability to increase subscription rates may be constrained by competitive pressures. Therefore, programming and operating costs may rise faster than associated revenue, resulting in a material negative impact on our cash flow and net earnings (loss). We are also impacted by inflationary increases in salaries, wages, benefits and other administrative costs in certain of our markets. In this regard, inflation rates in the countries in which we operate have recently increased, and in many countries, such increases have been significant.

Continuing uncertainties and challenging conditions in the global economy and in the countries in which we operate may adversely impact our business, financial condition and results of operations. The current macroeconomic environment is highly volatile, and continuing instability in global markets, including ongoing trade negotiations, uncertainty over inflation and energy price fluctuations, have contributed to a challenging global economic environment. Future developments are dependent upon a number of political and economic factors, including the additional borrowing incurred by countries since the start of the pandemic and the potential for low growth expectations as social restrictions are lifted. As a result, we cannot predict how long challenging conditions will exist or the extent to which the markets in which we operate may deteriorate. Additional risks arising from the ongoing economic challenges in Europe are described below under the Risk Factor titled: *We are exposed to sovereign debt and currency instability risks that could have an adverse impact on our liquidity, financial condition and cash flows.*

Unfavorable economic conditions may impact a significant number of our subscribers and/or the prices we are able to charge for our products and services, and, as a result, it may be (1) more difficult for us to attract new subscribers, (2) more likely that subscribers will downgrade or disconnect their services and (3) more difficult for us to maintain ARPUs at existing levels. Countries may also seek new or increased revenue sources due to fiscal deficits. Such actions may further adversely affect our company. Accordingly, our ability to increase, or, in certain cases, maintain, the revenue, ARPUs, RGUs, mobile subscribers, Adjusted EBITDA, Adjusted EBITDA margins and liquidity of our operating segments could be adversely affected if the macroeconomic environment remains uncertain or declines further. We are currently unable to predict the extent of any of these potential adverse effects.

We are exposed to sovereign debt and currency instability risks that could have an adverse impact on our liquidity, financial condition and cash flows. Our operations are subject to macroeconomic and political risks that are outside of our control. For example, high levels of sovereign debt in the U.S. and several countries in which we or our affiliates operate,

combined with structural changes arising from the pandemic, could potentially lead to fiscal reforms (including austerity measures), tax increases, sovereign debt restructurings, high corporate default rates, currency instability, increased counterparty credit risk, high levels of volatility and disruptions in the credit and equity markets, as well as other outcomes that might adversely impact our company. With regard to currency instability issues, concerns exist in the eurozone with respect to individual macro-fundamentals on a country-by-country basis, as well as with respect to the overall stability of the European monetary union and the suitability of a single currency to appropriately deal with specific fiscal management and sovereign debt issues in individual eurozone countries. The realization of these concerns could lead to the exit of one or more countries from the European monetary union and the re-introduction of individual currencies in these countries, or, in more extreme circumstances, the possible dissolution of the European monetary union entirely, which could result in the redenomination of a portion or, in the extreme case, all of our euro-denominated assets, liabilities and cash flows to the new currency of the country in which they originated. This could result in a mismatch in the currencies of our assets, liabilities and cash flows. Any such mismatch, together with the capital market disruption that would likely accompany any such redenomination event, could have a material adverse impact on our liquidity and financial condition. Furthermore, any redenomination event would likely be accompanied by significant economic dislocation, particularly within the eurozone countries, which in turn could have an adverse impact on demand for our products and services, and accordingly, on our revenue and cash flows. Moreover, any changes from euro to non-euro currencies within the countries in which we operate would require us to modify our billing and other financial systems. No assurance can be given that any required modifications could be made within a time frame that would allow us to timely bill our customers or prepare and file required financial reports. In light of the significant exposure that we have to the euro through our euro-denominated borrowings, derivative instruments, cash balances and cash flows, a redenomination event could have a material adverse impact on our company.

We may not freely access the cash of our operating companies. Our operations are conducted through our subsidiaries. Our current sources of corporate liquidity include (1) our cash and cash equivalents, (2) investments held within separately managed accounts, and (3) interest and dividend income received on our cash and cash equivalents and investments. From time to time, we also receive (1) proceeds in the form of distributions or loan repayments from our subsidiaries or affiliates, (2) proceeds upon the disposition of investments and other assets and (3) proceeds in connection with the incurrence of debt or the issuance of equity securities. The ability of our operating subsidiaries to pay dividends or to make other payments or advances to us depends on their individual operating results and any statutory, regulatory or contractual restrictions to which they may be or may become subject and in some cases our receipt of such payments or advances may be limited due to tax considerations or the presence of noncontrolling interests. Most of our operating subsidiaries are subject to credit agreements or indentures that restrict sales of assets and prohibit or limit the payment of dividends or the making of distributions, loans or advances to shareholders and partners, including us. In addition, because these subsidiaries are separate and distinct legal entities they have no obligation to provide us funds for payment obligations, whether by dividends, distributions, loans or other payments.

We are exposed to the risk of default by the counterparties to our cash and short-term investments, derivative and other financial instruments, and undrawn debt facilities. Although we seek to manage the credit risks associated with our cash and short-term investments, derivative and other financial instruments, and undrawn debt facilities, we are exposed to the risk that our counterparties will default on their obligations to us. While we regularly review our credit exposures and currently have no specific concerns about the creditworthiness of any counterparty for which we have material credit risk exposures, we cannot rule out the possibility that one or more of our counterparties could fail or otherwise be unable to meet its obligations to us. Any such instance of default or failure could have an adverse effect on our cash flows, results of operations, financial condition and/or liquidity. In this regard, (1) we may incur losses to the extent that we are unable to recover debts owed to us, including cash deposited and the value of financial losses, (2) we may incur significant costs to recover amounts owed to us, and such recovery may take a long period of time or may not be possible at all, (3) our derivative liabilities may be accelerated by the default of our counterparty, (4) we may be exposed to financial risks as a result of the termination of affected derivative contracts, and it may be costly or impossible to replace such contracts or otherwise mitigate such risks, (5) amounts available under committed credit facilities may be reduced and (6) disruption to the credit markets could adversely impact our ability to access debt financing on favorable terms, or at all.

At December 31, 2021, our exposure to counterparty credit risk included (1) derivative assets with an aggregate fair value of \$57.8 million, (2) cash and cash equivalent and restricted cash balances of \$917.3 million and (3) aggregate undrawn debt facilities of \$1,560.3 million. For additional information on our derivative contracts, see note 8 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

We may not report net earnings. We reported earnings (loss) from continuing operations of \$13,527.5 million, (\$1,525.1 million) and (\$1,475.9 million) during 2021, 2020 and 2019, respectively. In light of our historical financial performance, we cannot assure you that we will report net earnings in the near future.

Other Factors

We have not historically paid any cash dividends, and we may not pay dividends equally or at all on any class of our ordinary shares. We do not presently intend to pay cash dividends on any class of our ordinary shares for the foreseeable future. However, we have the right to pay dividends, effect securities distributions or make bonus issues on Liberty Global Shares. In addition, any dividends or distributions on, or repurchases of Liberty Global Shares will reduce our “distributable reserves” (defined as our accumulated, realized profits less accumulated, realized losses, as measured for U.K. statutory purposes) legally available to be paid as dividends by our company under English law on any of our ordinary shares.

The loss of certain key personnel could harm our business. We have experienced employees at both the corporate and operational levels who possess substantial knowledge of our business and operations. We cannot assure you that we will be successful in retaining their services or that we would be successful in hiring and training suitable replacements without undue costs or delays. As a result, the loss of any of these key employees could cause significant disruptions in our business operations, which could materially adversely affect our results of operations.

John C. Malone has significant voting power with respect to corporate matters considered by our shareholders. John C. Malone beneficially owns outstanding ordinary shares of Liberty Global representing 30.48% of our aggregate voting power as of February 11, 2022. By virtue of Mr. Malone’s voting power in our company, as well as his position as Chairman of our board of directors, Mr. Malone may have significant influence over the outcome of any corporate transaction or other matters submitted to our shareholders for approval. For example, under English law and our articles of association, certain matters (including amendments to the articles of association) require the approval of 75% of the shareholders who vote (in person or by proxy) on the relevant resolution, and other certain corporate transactions or matters may require the approval of at least 75% of the outstanding shares of each class of our ordinary shares. Because Mr. Malone beneficially owns approximately 30.48% of our aggregate voting power and almost 70% of the outstanding Class B ordinary shares of Liberty Global, he has the ability to prevent the requisite approval threshold from being met even though the other shareholders may determine that such action or transaction is beneficial for the company. Mr. Malone’s rights to vote or dispose of his equity interests in our company are not subject to any restrictions in favor of us other than as may be required by applicable law and except for customary transfer restrictions pursuant to equity award agreements.

It may be difficult for a third-party to acquire us, even if doing so may be beneficial to our shareholders. Certain provisions of our articles of association and of English law may discourage, delay, or prevent a change in control of our company that a shareholder may consider favorable. These provisions include the following:

- authorizing a capital structure with multiple classes of ordinary shares; a Class B that entitles the holders to 10 votes per share; a Class A that entitles the holders to one vote per share; and a Class C that, except as otherwise required by applicable law, entitles the holders to no voting rights;
- authorizing the issuance of “blank check” shares (both ordinary and preference), which could be issued by our board of directors to increase the number of outstanding shares and thwart a takeover attempt;
- classifying our board of directors with staggered three-year terms, which may lengthen the time required to gain control of our board of directors, although under English law, shareholders of our company can remove a director without cause by ordinary resolution;
- prohibiting shareholder action by written resolution, thereby requiring all shareholder actions to be taken at a meeting of the shareholders;
- requiring the approval of 75% in value of the shareholders (or class of shareholders) and/or English court approval for certain statutory mergers or schemes of arrangements; and
- establishing advance notice requirements for nominations of candidates for election to our board of directors or for proposing matters that can be acted upon by shareholders at shareholder meetings.

Change in control provisions in our incentive plans and related award agreements or in executive employment agreements may also discourage, delay or prevent a change in control of our company, even if such change of control would be in the best interests of our shareholders.

The enforcement of civil liabilities against us may be more difficult. Because we are a public limited company incorporated under the laws of England and Wales, investors could experience more difficulty enforcing judgments obtained against us in U.S. courts than would currently be the case for U.S. judgments obtained against a U.S. company. It may also be more difficult (or impossible) to bring some types of claims against us in courts sitting in England than it would be to bring similar claims against a U.S. company in a U.S. court. In particular, English law significantly limits the circumstances under which shareholders of English companies may bring derivative actions. Under English law generally, only the company can be the proper plaintiff in proceedings in respect of wrongful acts committed against us. Our articles of association provide for the exclusive jurisdiction of the English courts for shareholder lawsuits against us or our directors.

We are exposed to the risks arising from widespread epidemic diseases in the countries in which we operate, such as the outbreak of COVID-19, which could have a material adverse impact on our business, financial condition and results of operations. The COVID-19 pandemic and the emergency measures imposed by governments worldwide, including travel restrictions, restrictions on social activity and the shutdown of non-essential businesses have adversely impacted the global economy, disrupted global supply chains and created significant volatility and disruption of financial markets. While it is not currently possible to estimate the duration and severity of the COVID-19 pandemic or the adverse economic impact resulting from the preventative measures taken to contain or mitigate its outbreak, an extended period of global economic disruption could have a material adverse impact on our business, financial condition and results of operations in future periods. We may also be adversely impacted by any government mandated regulations on our business that could be implemented in response to the COVID-19 pandemic. In addition, countries may seek new or increased revenue sources due to fiscal deficits that result from measures taken to mitigate the adverse economic impacts of COVID-19, such as by imposing new taxes on the products and services we provide. We are currently unable to predict the extent of any of these potential adverse effects.

Item 1B. UNRESOLVED STAFF COMMENTS

None.

Item 2. PROPERTIES

We lease our corporate offices in London, U.K., in Denver, Colorado, U.S. and in Amsterdam, the Netherlands. All of our other real or personal property is owned or leased by our subsidiaries and affiliates.

Our subsidiaries and affiliates own or lease the fixed assets necessary for the operation of their respective businesses, including office space, transponder space, headend facilities, rights of way, cable television and telecommunications distribution equipment, telecommunications switches, base stations, cell towers and customer premises equipment and other property necessary for their operations. The physical components of their broadband networks require maintenance and periodic upgrades to support the new services and products they introduce. Subject to these maintenance and upgrade activities, our management believes that our current facilities are suitable and adequate for our business operations for the foreseeable future.

Item 3. LEGAL PROCEEDINGS

From time to time, our subsidiaries and affiliates have become involved in litigation relating to claims arising out of their operations in the normal course of business. For additional information, see note 18 to our consolidated financial statements in Part II of this Annual Report on Form 10-K.

Item 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

General

The capitalized terms used in Part II of this Annual Report on Form 10-K are defined in the notes to our consolidated financial statements. In the following text, the terms "we," "our," "our company" and "us" may refer, as the context requires, to Liberty Global or collectively to Liberty Global and its subsidiaries.

Market Information

Our share capital comprises Liberty Global Class A, Class B and Class C ordinary shares, which trade on the Nasdaq Global Select Market under the symbols "LBTYA," "LBTYB," and "LBTYK," respectively. Share price information for securities traded on the Nasdaq Global Select Market can be found on the Nasdaq's website at www.nasdaq.com.

The following table sets forth the quarterly range of high and low sales prices of Liberty Global Class B ordinary shares for 2021 and 2020. Although Liberty Global Class B ordinary shares are traded on the Nasdaq Global Select Market, an established public trading market does not exist for the shares, as they are not actively traded.

	Liberty Global Class B ordinary shares			
	High		Low	
2021				
First quarter	\$	36.11	\$	22.58
Second quarter	\$	38.89	\$	25.00
Third quarter	\$	31.00	\$	26.15
Fourth quarter	\$	30.85	\$	26.76
2020				
First quarter	\$	21.94	\$	15.98
Second quarter	\$	58.31	\$	16.52
Third quarter	\$	25.70	\$	20.60
Fourth quarter	\$	26.10	\$	19.51

Holders

As of January 31, 2022, there were 1,199, six and 1,368 record holders of Liberty Global Class A, Class B and Class C ordinary shares, respectively. These amounts do not include the number of shareholders whose shares are nominally held by banks, brokerage houses or other institutions, but include each such institution as one record holder.

Dividends

We have not paid any cash dividends on any of our ordinary shares, and we have no present intention of doing so. Any future payment of cash dividends will be determined by our board of directors in light of our earnings, financial condition and other relevant considerations, including applicable laws in England and Wales.

Recent Sales of Unregistered Securities; Use of Proceeds from Registered Securities

None.

Issuer Purchase of Equity Securities

The following table sets forth information regarding our company's purchase of its own equity securities during the three months ended December 31, 2021:

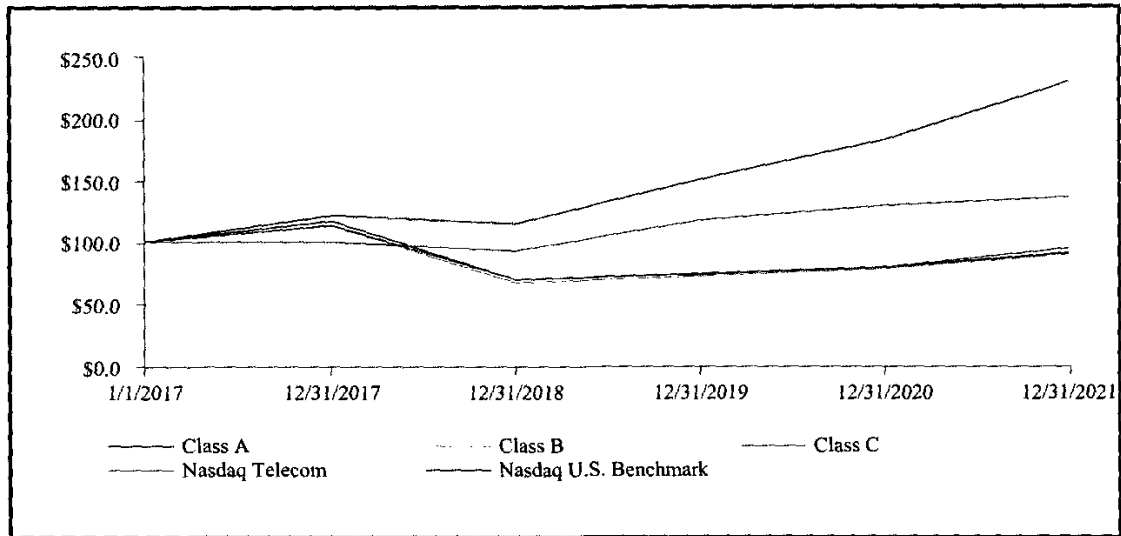
Period	Total number of shares purchased	Average price paid per share (a)	Total number of shares purchased as part of publicly-announced plans or programs	Value of shares that may yet be repurchased under the plans or programs
October 1, 2021 through October 31, 2021:				
Class A	—	—	—	(b)
Class C	3,734,300	29.60	3,734,300	(b)
November 1, 2021 through November 30, 2021:				
Class A	—	—	—	(b)
Class C	4,532,300	28.63	4,532,300	(b)
December 1, 2021 through December 31, 2021:				
Class A	2,600,000	27.75	2,600,000	(b)
Class C	8,636,748	28.02	8,636,748	(b)
Total — October 1, 2021 through December 31, 2021:				
Class A	2,600,000	27.75	2,600,000	(b)
Class C	16,903,348	28.54	16,903,348	(b)

(a) Average price paid per share includes direct acquisition costs.

(b) Under our current repurchase program that was approved in July 2021, we are authorized during 2022 to repurchase 10% of our total outstanding shares as of the beginning of the year, or 52.75 million shares. Based on the respective closing share prices as of December 31, 2021, this would equate to total share repurchases of approximately \$1.5 billion. However, the actual U.S. dollar amount of our share repurchases during 2022 will be determined by the actual transaction date share prices during the year and could differ significantly from this amount. In addition, we are authorized during 2023 to repurchase 10% of our total outstanding shares as of January 1, 2023. Our previous share repurchase program, which authorized our share repurchases during 2021, was completed and expired at the end of 2021.

Stock Performance Graph

The following graph compares the changes in the cumulative total shareholder return on our Liberty Global Class A, Class B and Class C ordinary shares from January 1, 2017 to December 31, 2021, to the change in the cumulative total return on the ICB 6500 Telecommunications and the Nasdaq US Benchmark TR Index (assuming reinvestment of dividends, where applicable). The graph assumes that \$100 was invested on January 1, 2017.



	December 31,				
	2017	2018	2019	2020	2021
Liberty Global - Class A	\$ 117.16	\$ 69.76	\$ 74.34	\$ 79.18	\$ 90.68
Liberty Global - Class B	\$ 113.04	\$ 66.77	\$ 72.31	\$ 77.97	\$ 89.54
Liberty Global - Class C	\$ 113.94	\$ 69.49	\$ 73.40	\$ 79.63	\$ 94.58
ICB 6500 Telecommunications	\$ 99.90	\$ 93.09	\$ 117.64	\$ 129.21	\$ 136.10
Nasdaq US Benchmark TR Index	\$ 121.38	\$ 114.78	\$ 150.55	\$ 182.57	\$ 229.84

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

The following discussion and analysis, which should be read in conjunction with our consolidated financial statements, is intended to assist in providing an understanding of our results of operations and financial condition and is organized as follows:

- *Overview.* This section provides a general description of our business and recent events.
- *Results of Operations.* This section provides an analysis of our results of operations for the years ended December 31, 2021 and 2020.
- *Liquidity and Capital Resources.* This section provides an analysis of our corporate and subsidiary liquidity and consolidated statements of cash flow.
- *Critical Accounting Policies, Judgments and Estimates.* This section discusses those material accounting policies that involve uncertainties and require significant judgment in their application.
- *Quantitative and Qualitative Disclosures about Market Risk.* This section provides discussion and analysis of the foreign currency, interest rate and other market risk that our company faces.

Unless otherwise indicated, convenience translations into U.S. dollars are calculated, and operational data is presented, as of December 31, 2021.

Included below is an analysis of our results of operations and cash flows for 2021, as compared to 2020. An analysis of our results of operations and cash flows for 2020, as compared to 2019, can be found under *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our Annual Report on Form 10-K, as amended, for the year ended December 31, 2020 (our **2020 10-K**), which is available through the Securities and Exchange Commission's website at www.sec.gov.

Overview

General

We are an international provider of broadband internet, video, fixed-line telephony and mobile communications services to residential customers and businesses in Europe. Our operations comprise businesses that provide residential and B2B communications services in (i) Switzerland and Slovakia through UPC Holding, (ii) Belgium through Telenet and (iii) Ireland through another wholly-owned subsidiary of Liberty Global. In addition, we own 50% noncontrolling interests in (a) the VodafoneZiggo JV, which provides residential and B2B communications services in the Netherlands, and (b) the VMO2 JV, which provides residential and B2B communication services in the U.K.

In addition, we currently provide residential and B2B communications services in Poland through UPC Holding. On September 22, 2021, we entered into an agreement to sell our operations in Poland. Accordingly, our operations in Poland are reflected as discontinued operations for all periods presented. In the following discussion and analysis, the operating statistics, results of operations, cash flows and financial condition that we present and discuss are those of our continuing operations, unless otherwise indicated. For additional information regarding the pending sale of UPC Poland, including with respect to our current expectations on timing and use of proceeds, see note 6 to our consolidated financial statements.

Through May 31, 2021, our consolidated operations also provided residential and B2B communications services in the U.K. through Virgin Media. On June 1, 2021, we contributed the U.K. JV Entities to the VMO2 JV and began accounting for our 50% interest in the VMO2 JV as an equity method investment. For additional information, see note 6 to our consolidated financial statements.

Operations

Our company delivers market-leading products through next-generation networks that connect our customers to broadband internet, video, fixed-line telephony and mobile services. At December 31, 2021, our continuing operations owned and operated networks that passed 7,477,100 homes and served 4,129,700 fixed-line customers and 5,689,900 mobile subscribers.

Broadband internet services. We offer multiple tiers of broadband internet service up to Gigabit speeds depending on location. We continue to invest in new technologies that allow us to increase the internet speeds we offer to our customers.

Video services. We provide video services, including various enhanced products that enable our customers to control when they watch their programming. These products range from digital video recorders to multimedia home gateway systems capable of distributing video, voice and data content throughout the home and to multiple devices.

Fixed-line telephony services. We offer fixed-line telephony services via either voice-over-internet-protocol or “VoIP” technology or circuit-switched telephony, depending on location.

Mobile services. We offer voice and data mobile services, either over our own networks or as an MVNO over third-party networks, depending on location. In addition, we generate revenue from the sale of mobile handsets.

B2B services. Our B2B services include voice, broadband internet, data, video, wireless and cloud services.

Other. We also have significant investments in ITV, Univision, Lacework, Plume, the Atlas Edge JV, All3Media, EdgeConneX, Lionsgate, the Formula E racing series and several regional sports networks.

For additional information regarding the details of our products and services, see *Item 1. Business* included in Part I of this Annual Report on Form 10-K.

Strategy and Management Focus

From a strategic perspective, we are seeking to build national fixed-mobile converged communications businesses that have strong prospects for future growth. As discussed further under *Liquidity and Capital Resources — Capitalization* below, we also seek to maintain our debt at levels that provide for attractive equity returns without assuming undue risk.

We strive to achieve organic revenue and customer growth in our operations by developing and marketing bundled entertainment and information and communications services, and extending and upgrading the quality of our networks where appropriate. As we use the term, organic growth excludes foreign currency translation effects (FX) and the estimated impact of acquisitions and dispositions. While we seek to increase our customer base, we also seek to maximize the average revenue we receive from each household by increasing the penetration of our broadband internet, digital video, fixed-line telephony and mobile services with existing customers through product bundling and upselling.

Impact of COVID-19

The global COVID-19 pandemic continues to impact the economies of the countries in which we operate. However, during 2021, the impact on our company continued to be relatively minimal as demand for our products and services remained strong. It is not currently possible to estimate the duration and severity of the COVID-19 pandemic or the adverse economic impact resulting from the preventative measures taken to contain or mitigate its outbreak, therefore no assurance can be given that an extended period of global economic disruption would not have a material adverse impact on our business, financial condition and results of operations in future periods. For additional information regarding the impact of COVID-19 on our results of operations during 2021 and 2020, see *Discussion and Analysis of our Reportable Segments* below.

Competition and Other External Factors

We are experiencing competition in all of the markets in which we or our affiliates operate. This competition, together with macroeconomic and regulatory factors, has adversely impacted our revenue, number of customers and/or average monthly subscription revenue per fixed-line customer or mobile subscriber, as applicable (ARPU). For additional information regarding the competition we face, see *Item 1. Business - Competition* and *- Regulatory Matters* included in Part I of this Annual Report on Form 10-K. For additional information regarding the revenue impact of changes in the fixed-line customers and ARPU of our consolidated reportable segments, see *Discussion and Analysis of our Reportable Segments* below.

For information regarding certain other regulatory developments that could adversely impact our results of operations in future periods, see *Legal and Regulatory Proceedings and Other Contingencies* in note 18 to our consolidated financial statements.

Results of Operations

We have completed a number of transactions that impact the comparability of our 2021 and 2020 results of operations, the most notable of which are (i) the Sunrise Acquisition on November 11, 2020 and (ii) the U.K. JV Transaction on June 1, 2021. For further information regarding our acquisitions and dispositions, see notes 5 and 6, respectively, to our consolidated financial statements.

In the following discussion, we quantify the estimated impact of material acquisitions (the **Acquisition Impact**) and dispositions on our operating results. The Acquisition Impact represents our estimate of the difference between the operating results of the periods under comparison that is attributable to an acquisition. In general, we base our estimate of the Acquisition Impact on an acquired entity's operating results during the first three to twelve months following the acquisition date, as adjusted to remove integration costs and any other material unusual or nonoperational items, such that changes from those operating results in subsequent periods are considered to be organic changes. Accordingly, in the following discussion, (i) organic variances attributed to an acquired entity during the first 12 months following the acquisition date represent differences between the Acquisition Impact and the actual results and (ii) the calculation of our organic change percentages includes the organic activity of an acquired entity relative to the Acquisition Impact of such entity. With respect to material dispositions, the organic changes that are discussed below reflect adjustments to exclude the historical prior-year results of any disposed entities to the extent that such entities are not included in the corresponding results for the current-year period.

Changes in foreign currency exchange rates have a significant impact on our reported operating results as all of our operating segments have functional currencies other than the U.S. dollar. Our primary exposure to FX risk during the three months ended December 31, 2021 was to the euro and Swiss franc, as 55.2% and 43.7% of our reported revenue during such period was derived from subsidiaries whose functional currencies are the euro and Swiss franc, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for certain other local currencies in Europe. The portions of the changes in the various components of our results of operations that are attributable to changes in FX are highlighted under *Discussion and Analysis of our Reportable Segments* and *Discussion and Analysis of our Consolidated Operating Results* below. For information regarding our foreign currency risks and the applicable foreign currency exchange rates in effect for the periods covered by this Annual Report on Form 10-K, see *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

The amounts presented and discussed below represent 100% of each of our consolidated reportable segment's results of operations. As we have the ability to control Telenet, we consolidate 100% of its revenue and expenses in our consolidated statements of operations despite the fact that third parties own a significant interest. The noncontrolling owners' interests in the operating results of Telenet and other less significant majority-owned subsidiaries are reflected in net earnings or loss attributable to noncontrolling interests in our consolidated statements of operations.

Discussion and Analysis of our Reportable Segments

General

All of our reportable segments derive their revenue primarily from residential and B2B communications services. For detailed information regarding the composition of our reportable segments and how we define and categorize our revenue components, see note 19 to our consolidated financial statements. For information regarding the results of operations of the VodafoneZiggo JV and, for the period beginning June 1, 2021, the VMO2 JV, refer to *Discussion and Analysis of our Consolidated Operating Results — Share of results of affiliates, net*, below.

The tables presented below in this section provide the details of the revenue and Adjusted EBITDA of our consolidated reportable segments for 2021, as compared to 2020. These tables present (i) the amounts reported for the current and comparative periods, (ii) the reported U.S. dollar change and percentage change from period to period and (iii) the organic U.S. dollar change and percentage change from period to period. For our organic comparisons, which exclude the impact of FX, we assume that exchange rates remained constant at the prior-period rate during all periods presented. We also provide a table showing the Adjusted EBITDA margins of our consolidated reportable segments for 2021 and 2020 at the end of this section.

Most of our revenue is derived from jurisdictions that administer VAT or similar revenue-based taxes. Any increases in these taxes could have an adverse impact on our ability to maintain or increase our revenue to the extent that we are unable to pass such tax increases on to our customers. In the case of revenue-based taxes for which we are the ultimate taxpayer, we will also experience increases in our operating costs and expenses and corresponding declines in our Adjusted EBITDA and Adjusted EBITDA margins to the extent of any such tax increases.

We pay interconnection fees to other telephony providers when calls or text messages from our subscribers terminate on another network, and we receive similar fees from such providers when calls or text messages from their customers terminate on our networks or networks that we access through MVNO or other arrangements. The amounts we charge and incur with respect to fixed-line telephony and mobile interconnection fees are subject to regulatory oversight. To the extent that regulatory authorities introduce fixed-line or mobile termination rate changes, we would experience prospective changes and, in very limited cases, we could experience retroactive changes in our interconnect revenue and/or costs. The ultimate impact of any such changes in termination rates on our Adjusted EBITDA would be dependent on the call or text messaging patterns that are subject to the changed termination rates.

We are subject to inflationary pressures with respect to certain costs and foreign currency exchange risk with respect to costs and expenses that are denominated in currencies other than the respective functional currencies of our consolidated reportable segments (**non-functional currency expenses**). Any cost increases that we are not able to pass on to our subscribers through rate increases would result in increased pressure on our operating margins. For additional information regarding our foreign currency exchange risks see *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

Consolidated Adjusted EBITDA is a non-GAAP measure, which we believe is a meaningful measure because it represents a transparent view of our recurring operating performance that is unaffected by our capital structure and allows management to readily view operating trends from a consolidated view. Investors should view consolidated Adjusted EBITDA as a supplement to, and not a substitute for, GAAP measures of performance included in our consolidated statements of operations.

The following table provides a reconciliation of earnings (loss) from continuing operations to Adjusted EBITDA:

	Year ended December 31,		
	2021	2020	2019
	in millions		
Earnings (loss) from continuing operations	\$ 13,527.5	\$ (1,525.1)	\$ (1,475.9)
Income tax expense (benefit)	473.3	(275.9)	234.0
Other income, net	(44.9)	(76.2)	(114.4)
Gain on Atlas Edge JV Transactions	(227.5)	—	—
Gain on U.K. JV Transaction	(10,873.8)	—	—
Share of results of affiliates, net	175.4	245.3	198.5
Losses on debt extinguishment, net	90.6	233.2	216.7
Realized and unrealized gains due to changes in fair values of certain investments and debt, net	(735.0)	(45.2)	(72.0)
Foreign currency transaction losses (gains), net	(1,324.5)	1,409.3	95.6
Realized and unrealized losses (gains) on derivative instruments, net	(622.9)	878.7	193.2
Interest expense	882.1	1,186.8	1,384.2
Operating income	1,320.3	2,030.9	659.9
Impairment, restructuring and other operating items, net	(19.0)	97.4	155.4
Depreciation and amortization	2,353.7	2,227.2	3,546.3
Share-based compensation expense	308.1	348.0	305.8
Adjusted EBITDA	\$ 3,963.1	\$ 4,703.5	\$ 4,667.4

Revenue of our Consolidated Reportable Segments

General. While not specifically discussed in the below explanations of the changes in the revenue of our consolidated reportable segments, we are experiencing competition in all of our markets. This competition has an adverse impact on our ability to increase or maintain our total number of customers and/or our ARPU.

Variances in the subscription revenue that we receive from our customers are a function of (i) changes in the number of our fixed-line customers or mobile subscribers outstanding during the period and (ii) changes in ARPU. Changes in ARPU can be attributable to (a) changes in prices, (b) changes in bundling or promotional discounts, (c) changes in the tier of services selected, (d) variances in subscriber usage patterns and (e) the overall mix of fixed and mobile products within a segment during the period.

Revenue — 2021 compared to 2020

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2021	2020	\$	%	\$	%
in millions, except percentages						
Switzerland	\$ 3,321.9	\$ 1,573.8	\$ 1,748.1	111.1	\$ (35.5)	(1.1)
Belgium	3,065.9	2,940.9	125.0	4.3	21.7	0.7
U.K. (a)	2,736.4	6,076.9	(3,340.5)	(55.0)	63.1	2.6
Ireland	550.0	513.7	36.3	7.1	18.2	3.5
Central and Other	648.7	461.9	186.8	40.4	32.3	7.0
Intersegment eliminations	(11.6)	(21.8)	10.2	N.M.	10.2	N.M.
Total	<u>\$ 10,311.3</u>	<u>\$ 11,545.4</u>	<u>\$ (1,234.1)</u>	<u>(10.7)</u>	<u>\$ 110.0</u>	<u>1.1</u>

N.M. — Not Meaningful.

(a) Represents the revenue of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.

Switzerland. The details of the increase in Switzerland's revenue during 2021, as compared to 2020, are set forth below:

	Subscription revenue	Non- subscription revenue	Total
	in millions		
Decrease in residential fixed subscription revenue due to change in:			
Average number of customers	\$ (25.5)	\$ —	\$ (25.5)
ARPU	(15.1)	—	(15.1)
Decrease in residential fixed non-subscription revenue	—	(2.7)	(2.7)
Total decrease in residential fixed revenue	(40.6)	(2.7)	(43.3)
Increase (decrease) in residential mobile revenue (a)	46.7	(73.8)	(27.1)
Increase (decrease) in B2B revenue (b)	(0.7)	45.3	44.6
Decrease in other revenue	—	(9.7)	(9.7)
Total organic increase (decrease)	5.4	(40.9)	(35.5)
Impact of acquisitions	1,178.9	547.0	1,725.9
Impact of FX	31.2	26.5	57.7
Total	\$ 1,215.5	\$ 532.6	\$ 1,748.1

- (a) The increase in residential mobile subscription revenue is largely due to an increase in the average number of mobile subscribers. The decrease in residential mobile non-subscription revenue is primarily attributable to a decrease in revenue from mobile handset sales.
- (b) The increase in B2B non-subscription revenue is primarily due to the net effect of (i) higher revenue from wholesale services and (ii) lower revenue from telephony services.

Belgium. The details of the increase in Belgium's revenue during 2021, as compared to 2020, are set forth below:

	Subscription revenue	Non- subscription revenue	Total
	in millions		
Increase (decrease) in residential fixed subscription revenue due to change in:			
Average number of customers	\$ (24.0)	\$ —	\$ (24.0)
ARPU	11.8	—	11.8
Increase in residential fixed non-subscription revenue	—	4.6	4.6
Total increase (decrease) in residential fixed revenue	(12.2)	4.6	(7.6)
Increase (decrease) in residential mobile revenue (a)	12.3	(20.7)	(8.4)
Increase (decrease) in B2B revenue (b)	21.4	(1.3)	20.1
Increase in other revenue (c)	—	17.6	17.6
Total organic increase	21.5	0.2	21.7
Impact of dispositions	(1.8)	(0.5)	(2.3)
Impact of FX	80.8	24.8	105.6
Total	\$ 100.5	\$ 24.5	\$ 125.0

- (a) The increase in residential mobile subscription revenue is primarily due to the net effect of (i) higher ARPU and (ii) a decrease in the average number of mobile subscribers. The decrease in residential mobile non-subscription revenue is primarily attributable to lower interconnect revenue.
- (b) The increase in B2B subscription revenue is primarily attributable to an increase in the average number of customers.
- (c) The increase in other revenue is attributable to higher broadcasting revenue.

For information concerning certain regulatory developments that could have an adverse impact on our revenue in Belgium, see *Legal and Regulatory Proceedings and Other Contingencies — Belgium Regulatory Developments* in note 18 to our consolidated financial statements.

U.K. The details of the decrease in the U.K.'s revenue during 2021, as compared to 2020, are set forth below:

	Subscription revenue	Non- subscription revenue	Total
	in millions		
Increase (decrease) in residential fixed subscription revenue due to change in:			
Average number of customers	\$ 74.7	\$ —	\$ 74.7
ARPU (a)	(93.8)	—	(93.8)
Increase in residential fixed non-subscription revenue (b)	—	13.0	13.0
Total increase (decrease) in residential fixed revenue	(19.1)	13.0	(6.1)
Increase in residential mobile revenue (c)	1.3	32.7	34.0
Increase in B2B revenue (d)	9.9	25.4	35.3
Decrease in other revenue	—	(0.1)	(0.1)
Total organic increase (decrease)	(7.9)	71.0	63.1
Impact of dispositions	(2,802.3)	(802.2)	(3,604.5)
Impact of FX	158.7	42.2	200.9
Total	\$ (2,651.5)	\$ (689.0)	\$ (3,340.5)

- (a) The decrease in fixed subscription revenue related to a change in ARPU includes an increase of approximately \$19 million associated with the pausing or cancellation of certain sporting events during the second quarter of 2020, as further described under *Discussion and Analysis of our Consolidated Operating Results — Programming and other direct costs of services* below.
- (b) The increase in residential fixed non-subscription revenue is primarily attributable to increases in (i) revenue from late fees, (ii) cancellation revenue and (iii) installation revenue.
- (c) The increase in residential mobile non-subscription revenue is primarily attributable to an increase in revenue from mobile handset sales.
- (d) The increase in B2B subscription revenue is primarily due to an increase in the average number of customers. The increase in B2B non-subscription revenue is primarily attributable to the net effect of (i) an increase in revenue associated with long-term leases of a portion of our network and (ii) lower revenue from data services.

Ireland. The details of the increase in Ireland's revenue during 2021, as compared to 2020, are set forth below:

	Subscription revenue	Non- subscription revenue	Total
	in millions		
Increase (decrease) in residential fixed subscription revenue due to change in:			
Average number of customers	\$ (1.5)	\$ —	\$ (1.5)
ARPU	0.3	—	0.3
Increase in residential fixed non-subscription revenue	—	0.1	0.1
Total increase (decrease) in residential fixed revenue	(1.2)	0.1	(1.1)
Increase (decrease) in residential mobile revenue	4.1	(1.0)	3.1
Increase (decrease) in B2B revenue	0.7	(3.0)	(2.3)
Increase in other revenue (a)	—	18.5	18.5
Total organic increase	3.6	14.6	18.2
Impact of FX	14.2	3.9	18.1
Total	\$ 17.8	\$ 18.5	\$ 36.3

(a) The increase in other revenue is attributable to higher broadcasting revenue.

Revenue — 2020 compared to 2019

For discussion and analysis of the revenue of our consolidated reportable segments during 2020, as compared to 2019, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2020 10-K.

Programming and Other Direct Costs of Services, Other Operating Expenses and SG&A Expenses of our Consolidated Reportable Segments

For information regarding the changes in our (i) programming and other direct costs of services, (ii) other operating expenses and (iii) SG&A expenses, see *Discussion and Analysis of our Consolidated Operating Results* below.

Adjusted EBITDA of our Consolidated Reportable Segments

Adjusted EBITDA is the primary measure used by our chief operating decision maker to evaluate segment operating performance. As presented below, consolidated Adjusted EBITDA is a non-GAAP measure, which investors should view as a supplement to, and not a substitute for, GAAP measures of performance included in our consolidated statements of operations. The following tables set forth the Adjusted EBITDA of our consolidated reportable segments.

Adjusted EBITDA — 2021 compared to 2020

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2021	2020	\$	%	\$	%
in millions, except percentages						
Switzerland	\$ 1,208.7	\$ 693.8	\$ 514.9	74.2	\$ (10.5)	(0.9)
Belgium	1,481.8	1,413.4	68.4	4.8	17.2	1.2
U.K. (a)	1,085.3	2,453.5	(1,368.2)	(55.8)	(13.0)	(1.3)
Ireland	218.6	202.0	16.6	8.2	9.6	4.8
Central and Other	(33.1)	(61.4)	28.3	46.1	(49.4)	(80.5)
Intersegment eliminations	1.8	2.2	(0.4)	N.M.	(0.4)	N.M.
Total	<u>\$ 3,963.1</u>	<u>\$ 4,703.5</u>	<u>\$ (740.4)</u>	<u>(15.7)</u>	<u>\$ (46.5)</u>	<u>(1.2)</u>

N.M. — Not Meaningful.

(a) Represents the Adjusted EBITDA of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.

Adjusted EBITDA Margin

The following table sets forth the Adjusted EBITDA margins (Adjusted EBITDA divided by revenue) of each of our consolidated reportable segments:

	Year ended December 31,	
	2021	2020
Switzerland	36.4 %	44.1 %
Belgium	48.3 %	48.1 %
U.K. (a)	39.7 %	40.4 %
Ireland	39.7 %	39.3 %

(a) Represents the results of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.

In addition to organic changes in the revenue, operating and SG&A expenses of our consolidated reportable segments, the Adjusted EBITDA margins presented above include the impact of acquisitions, as applicable. In this regard, the Sunrise Acquisition had a significant adverse impact on the Adjusted EBITDA margin in Switzerland, as the acquired Sunrise mobile business generates a relatively lower Adjusted EBITDA margin than our legacy operations in Switzerland. For discussion of the factors contributing to the changes in the Adjusted EBITDA margins of our consolidated reportable segments, see the analysis of our revenue included in *Discussion and Analysis of our Reportable Segments* above and the analysis of our expenses included in *Discussion and Analysis of our Consolidated Operating Results* below.

Adjusted EBITDA — 2020 compared to 2019

For the details of our Adjusted EBITDA and Adjusted EBITDA margins during 2020, as compared to 2019, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2020 10-K.

Discussion and Analysis of our Consolidated Operating Results

General

For more detailed explanations of the changes in our revenue, see *Discussion and Analysis of our Reportable Segments* above.

2021 compared to 2020

Revenue

Our revenue by major category is set forth below:

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2021	2020	\$	%	\$	%
in millions, except percentages						
Residential revenue:						
Residential fixed revenue (a):						
Subscription revenue (b):						
Broadband internet	\$ 2,371.7	\$ 3,181.9	\$ (810.2)	(25.5)	\$ 43.1	1.9
Video	1,831.8	2,446.2	(614.4)	(25.1)	(30.2)	(1.7)
Fixed-line telephony	841.1	1,328.2	(487.1)	(36.7)	(85.9)	(9.7)
Total subscription revenue	5,044.6	6,956.3	(1,911.7)	(27.5)	(73.0)	(1.5)
Non-subscription revenue	161.2	217.3	(56.1)	(25.8)	14.5	10.3
Total residential fixed revenue	5,205.8	7,173.6	(1,967.8)	(27.4)	(58.5)	(1.2)
Residential mobile revenue (c):						
Subscription revenue (b)	1,630.7	1,090.3	540.4	49.6	64.4	4.2
Non-subscription revenue	760.8	691.5	69.3	10.0	(62.9)	(7.8)
Total residential mobile revenue	2,391.5	1,781.8	609.7	34.2	1.5	0.1
Total residential revenue	7,597.3	8,955.4	(1,358.1)	(15.2)	(57.0)	(0.8)
B2B revenue (d):						
Subscription revenue	619.0	563.9	55.1	9.8	31.3	5.5
Non-subscription revenue	1,243.8	1,431.5	(187.7)	(13.1)	63.1	5.7
Total B2B revenue	1,862.8	1,995.4	(132.6)	(6.6)	94.4	5.6
Other revenue (e)						
Total	\$ 10,311.3	\$ 11,545.4	\$ (1,234.1)	(10.7)	\$ 110.0	1.1

- (a) Residential fixed subscription revenue includes amounts received from subscribers for ongoing services and the recognition of deferred installation revenue over the associated contract period. Residential fixed non-subscription revenue includes, among other items, channel carriage fees, late fees and revenue from the sale of equipment.
- (b) Residential subscription revenue from subscribers who purchase bundled services at a discounted rate is generally allocated proportionally to each service based on the standalone price for each individual service. As a result, changes in the standalone pricing of our fixed and mobile products or the composition of bundles can contribute to changes in our product revenue categories from period to period.
- (c) Residential mobile subscription revenue includes amounts received from subscribers for ongoing services. Residential mobile non-subscription revenue includes, among other items, interconnect revenue and revenue from sales of mobile handsets and other devices. Residential mobile interconnect revenue was \$232.6 million and \$227.9 million during 2021 and 2020, respectively.

- (d) B2B subscription revenue represents revenue from (i) services provided to SOHO subscribers and (ii) mobile services provided to medium and large enterprises. SOHO subscribers pay a premium price to receive expanded service levels along with broadband internet, video, fixed-line telephony or mobile services that are the same or similar to the mass marketed products offered to our residential subscribers. A portion of the increase in our B2B subscription revenue is attributable to the conversion of certain residential subscribers to SOHO subscribers. B2B non-subscription revenue includes (a) revenue from business broadband internet, video, fixed-line telephony and data services offered to medium and large enterprises and, on a wholesale basis, to other operators and (b) revenue from long-term leases of portions of our network.
- (e) Other revenue includes, among other items, (i) revenue earned from the VMO2 JV Services, the NL JV Services and the sale of customer premises equipment to the VodafoneZiggo JV, (ii) broadcasting revenue in Belgium and Ireland and (iii) revenue earned from transitional and other services provided to various third parties.

Total revenue. Our consolidated revenue decreased \$1,234.1 million or 10.7% during 2021, as compared to 2020. This decrease includes a decrease of \$3,604.5 million attributable to the impact of the U.K. JV Transaction and an increase of \$1,725.9 million attributable to the impact of the Sunrise Acquisition. On an organic basis, our consolidated revenue increased \$110.0 million or 1.1%.

Residential revenue. The details of the decrease in our consolidated residential revenue during 2021, as compared to 2020, are as follows (in millions):

Increase (decrease) in residential fixed subscription revenue due to change in:

Average number of customers	\$ 25.3
ARPU	(98.3)
Increase in residential fixed non-subscription revenue	14.5
Total decrease in residential fixed revenue	(58.5)
Increase in residential mobile subscription revenue	64.4
Decrease in residential mobile non-subscription revenue	(62.9)
Total organic decrease in residential revenue	(57.0)
Impact of acquisitions and dispositions	(1,592.1)
Impact of FX	291.0
Total decrease in residential revenue	\$ (1,358.1)

On an organic basis, our consolidated residential fixed subscription revenue decreased \$73.0 million or 1.5% during 2021, as compared to 2020, primarily attributable to decreases in Switzerland and the U.K.

On an organic basis, our consolidated residential fixed non-subscription revenue decreased \$14.5 million or 10.3% during 2021, as compared to 2020, primarily due an increase in the U.K.

On an organic basis, our consolidated residential mobile subscription revenue increased \$64.4 million or 4.2% during 2021, as compared to 2020, primarily attributable to increases in Switzerland and Belgium.

On an organic basis, our consolidated residential mobile non-subscription revenue decreased \$62.9 million or 7.8% during 2021, as compared to 2020, primarily due to the net effect of (i) decreases in Switzerland and Belgium and (ii) an increase in the U.K.

B2B revenue. On an organic basis, our consolidated B2B subscription revenue increased \$31.3 million or 5.5% during 2021, as compared to 2020, primarily due to increases in Belgium and the U.K.

On an organic basis, our consolidated B2B non-subscription revenue increased \$63.1 million or 5.7% during 2021, as compared to 2020, primarily attributable to increases in Switzerland and the U.K.

Other revenue. On an organic basis, our consolidated other revenue increased \$72.6 million or 11.7% during 2021, as compared to 2020, primarily attributable to (i) an increase in Central and Other related to revenue earned from (a) the sale of customer premises equipment to the VodafoneZiggo JV and (b) the NL JV Services and (ii) higher broadcasting revenue in Ireland and Belgium.

Programming and other direct costs of services

Programming and other direct costs of services include programming and copyright costs, interconnect and access costs, costs of mobile handsets and other devices and other direct costs related to our operations, including costs associated with our transitional service agreements. Programming and copyright costs represent a significant portion of our operating costs and are subject to rise in future periods due to various factors, including (i) higher costs associated with the expansion of our digital video content, including rights associated with ancillary product offerings and rights that provide for the broadcast of live sporting events and (ii) rate increases.

The details of our programming and other direct costs of services are as follows:

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2021	2020	\$	%	\$	%
in millions, except percentages						
Switzerland	\$ 1,063.2	\$ 417.7	\$ 645.5	154.5	\$ (49.8)	(4.5)
Belgium	706.8	695.9	10.9	1.6	(11.9)	(1.7)
U.K. (a)	868.1	1,911.9	(1,043.8)	(54.6)	35.4	4.6
Ireland	157.7	143.8	13.9	9.7	8.5	5.9
Central and Other	226.1	157.4	68.7	43.6	30.9	19.6
Intersegment eliminations	(4.3)	(6.1)	1.8	N.M.	1.8	N.M.
Total	\$ 3,017.6	\$ 3,320.6	\$ (303.0)	(9.1)	\$ 14.9	0.5

N.M. — Not Meaningful.

(a) Represents the programming and other direct costs of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.

Our programming and other direct costs of services decreased \$303.0 million or 9.1% during 2021, as compared to 2020. This decrease includes a decrease of \$1,142.7 million attributable to the impact of the U.K. JV Transaction and an increase of \$682.4 million attributable to the impact of the Sunrise Acquisition. On an organic basis, our programming and other direct costs of services increased \$14.9 million or 0.5%. This increase includes the following factors:

- A decrease in mobile handset and other device costs of \$52.4 million or 13.1%, primarily due to the net effect of (i) lower sales volumes, as a decrease in Switzerland was only partially offset by an increase in the U.K., and (ii) higher average costs per handset sold in the U.K.;
- An increase in programming and copyright costs of \$51.2 million or 3.2%, attributable to higher costs for certain premium and/or basic content, primarily in the U.K., Belgium and Ireland. The higher costs in the U.K. include an increase of \$14.1 million related to the net impact of credits received during the second quarters of 2020 and 2021 in connection with (i) the pausing or cancellation of certain sporting events due to the COVID-19 pandemic during 2020, which offset the aforementioned revenue increases, and (ii) the loss of certain content;
- A decrease in interconnect and access costs of \$24.9 million or 2.8%, primarily due to the net effect of (i) lower interconnect and mobile roaming costs, primarily in Belgium, the U.K. and Switzerland, (ii) higher leased tower costs in Switzerland and (iii) lower MVNO costs, primarily in Switzerland and the U.K.;
- An increase of \$16.3 million associated with the impact of the classification of costs in connection with the U.K. JV Services provided by Central and Other, which, subsequent to the completion of the U.K. JV Transaction, are classified as direct costs of services. This increase was fully offset by a corresponding decrease in various SG&A expense categories within Central and Other; and
- An increase in costs of \$14.2 million in Central and Other related to the sale of customer premises equipment to the VodafoneZiggo JV.

Other operating expenses

Other operating expenses include network operations, customer operations, customer care, share-based compensation and other costs related to our operations. We do not include share-based compensation in the following discussion and analysis of the other operating expenses of our consolidated reportable segments as share-based compensation expense is not included in the performance measures of our consolidated reportable segments. Share-based compensation expense is separately discussed further below.

The details of our other operating expenses are as follows:

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2021	2020	\$	%	\$	%
<i>in millions, except percentages</i>						
Switzerland	\$ 405.1	\$ 210.5	\$ 194.6	92.4	\$ (9.0)	(2.2)
Belgium	451.6	416.2	35.4	8.5	19.8	4.8
U.K. (a)	405.9	917.6	(511.7)	(55.8)	12.1	3.4
Ireland	94.5	93.2	1.3	1.4	(2.1)	(2.3)
Central and Other	115.1	72.2	42.9	59.4	29.4	40.7
Intersegment eliminations	(1.3)	2.0	(3.3)	N.M.	(3.3)	N.M.
Total other operating expenses excluding share-based compensation expense	1,470.9	1,711.7	(240.8)	(14.1)	\$ 46.9	3.4
Share-based compensation expense	13.7	7.6	6.1	80.3		
Total	\$ 1,484.6	\$ 1,719.3	\$ (234.7)	(13.7)		

N.M. — Not Meaningful.

(a) Represents the other operating expenses of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.

Our other operating expenses (exclusive of share-based compensation expense) decreased \$240.8 million or 14.1% during 2021, as compared to 2020. This decrease includes a decrease of \$538.6 million attributable to the impact of the U.K. JV Transaction and an increase of \$187.6 million attributable to the impact of the Sunrise Acquisition. On an organic basis, our other operating expenses increased \$46.9 million or 3.4%. This increase includes the following factors:

- An increase in personnel costs of \$27.7 million or 5.3%, primarily due to the net effect of (i) higher staffing levels, primarily in Switzerland and the U.K., (ii) lower costs due to the impact of an increase in the use of internal labor for certain network-related capital projects in the U.K. and (iii) higher average costs per employee, as a decrease in Switzerland was more than offset by increases in the U.K., Central and Other and Belgium;
- An increase in core network and information technology-related costs of \$22.5 million or 8.3%, primarily due to higher information technology-related expenses in Central and Other, Belgium and Switzerland;
- A decrease in bad debt expense of \$9.8 million or 12.0%, primarily due to decreases in the U.K., Switzerland and Ireland that were only partially offset by an increase in Belgium; and
- An increase in business service costs of \$9.3 million or 5.1%, primarily due to higher consulting costs in Switzerland and Central and Other.

SG&A expenses

SG&A expenses include human resources, information technology, general services, management, finance, legal, external sales and marketing costs, share-based compensation and other general expenses. We do not include share-based compensation in the following discussion and analysis of the SG&A expenses of our consolidated reportable segments as share-based compensation expense is not included in the performance measures of our consolidated reportable segments. Share-based compensation expense is separately discussed further below.

The details of our SG&A expenses are as follows:

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2021	2020	\$	%	\$	%
in millions, except percentages						
Switzerland	\$ 644.9	\$ 251.8	\$ 393.1	156.1	\$ 33.8	5.6
Belgium	425.7	415.4	10.3	2.5	(3.4)	(0.8)
U.K. (a)	377.1	793.9	(416.8)	(52.5)	28.6	9.0
Ireland	79.2	74.7	4.5	6.0	2.2	2.9
Central and Other	340.6	293.7	46.9	16.0	21.4	7.3
Intersegment eliminations	(7.8)	(19.9)	12.1	N.M.	12.1	N.M.
Total SG&A expenses excluding share-based compensation expense	1,859.7	1,809.6	50.1	2.8	\$ 94.7	5.6
Share-based compensation expense	294.4	340.4	(46.0)	(13.5)		
Total	\$ 2,154.1	\$ 2,150.0	\$ 4.1	0.2		

N.M. — Not Meaningful.

(a) Represents the SG&A expenses the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.

Supplemental SG&A expense information

	Year ended December 31,		Increase		Organic increase	
	2021	2020	\$	%	\$	%
in millions, except percentages						
General and administrative (a)	\$ 1,443.6	\$ 1,406.2	\$ 37.4	2.7	\$ 83.8	6.4
External sales and marketing	416.1	403.4	12.7	3.1	10.9	2.8
Total	\$ 1,859.7	\$ 1,809.6	\$ 50.1	2.8	\$ 94.7	5.6

(a) General and administrative expenses include all personnel-related costs within our SG&A expenses, including personnel-related costs associated with our sales and marketing function.

Our SG&A expenses (exclusive of share-based compensation expense) increased \$50.1 million or 2.8% during 2021, as compared to 2020. This increase includes a decrease of \$463.4 million attributable to the impact of the U.K. JV Transaction and an increase of \$347.7 million attributable to the impact of the Sunrise Acquisition. On an organic basis, our SG&A expenses increased \$94.7 million or 5.6%. This increase includes the following factors:

- An increase in core network and information technology-related costs of \$34.4 million or 17.6%, primarily due to higher information technology-related expenses in the U.K., Switzerland and Central and Other;
- An increase in personnel costs of \$34.4 million or 4.1%, primarily due to the net effect of (i) lower staffing levels, primarily in the U.K., Belgium and Switzerland, (ii) higher average costs per employee, primarily in Central and Other and the U.K., and (iii) higher incentive compensation costs, primarily in Central and Other, Switzerland and the U.K.

The higher average costs per employee in Central and Other include a decrease of \$13.8 million associated with the aforementioned impact of the classification of costs in connection with the U.K. JV Services provided by Central and Other, which, subsequent to the completion of the U.K. JV Transaction, are classified as direct costs of services; and

- An increase in external sales and marketing costs of \$10.9 million or 2.8%, primarily due to higher costs associated with advertising campaigns, as increases in the U.K. and Switzerland were only partially offset by a decrease in Belgium.

Share-based compensation expense

Our share-based compensation expense primarily relates to the share-based incentive awards issued by Liberty Global to its employees and employees of its subsidiaries. A summary of our aggregate share-based compensation expense is set forth below:

	Year ended December 31,	
	2021	2020
	<i>in millions</i>	
Liberty Global:		
Performance-based incentive awards (a)	\$ 59.6	\$ 127.4
Non-performance based incentive awards	168.6	134.1
Other (b)	33.6	46.2
Total Liberty Global	261.8	307.7
Telenet share-based incentive awards (c)	35.1	35.5
Other	11.2	4.8
Total	\$ 308.1	\$ 348.0
Included in:		
Other operating expenses	\$ 13.7	\$ 7.6
Total SG&A expenses	294.4	340.4
Total	\$ 308.1	\$ 348.0

- (a) Includes share-based compensation expense related to (i) PSUs, (ii) our 2019 CEO Performance Award and (iii) our 2019 Challenge Performance Awards.
- (b) Represents annual incentive compensation and defined contribution plan liabilities that have been or are expected to be settled with Liberty Global ordinary shares. In the case of the annual incentive compensation, shares have been or will be issued to senior management and key employees pursuant to a shareholding incentive program. The shareholding incentive program allows these employees to elect to receive up to 100% of their annual incentive compensation in ordinary shares of Liberty Global in lieu of cash.
- (c) Represents the share-based compensation expense associated with Telenet's share-based incentive awards, which, at December 31, 2021, included performance- and non-performance-based stock option awards with respect to 4,126,221 Telenet shares. These stock option awards had a weighted average exercise price of €39.73 (\$45.24).

For additional information concerning our share-based compensation, see note 15 to our consolidated financial statements.

Depreciation and amortization expense

Our depreciation and amortization expense was \$2,353.7 million and \$2,227.2 million during 2021 and 2020, respectively. Excluding the effects of FX, depreciation and amortization expense increased \$67.3 million or 3.0% during 2021, as compared to 2020. This increase is primarily due to the net effect of (i) an increase due to the Sunrise Acquisition, (ii) a decrease in the U.K. of \$577.5 million as a result of the held-for-sale presentation of the U.K. JV Entities effective May 7, 2020, (iii) an increase associated with property and equipment additions related to the installation of customer premises equipment, the expansion and upgrade of our networks and other capital initiatives, primarily in Central and Other, Belgium and Switzerland, and (iv) a decrease associated with certain assets becoming fully depreciated, primarily in Central and Other, Belgium and Switzerland. For information regarding the held-for-sale presentation of the U.K. JV Entities prior to completion of the U.K. JV Transaction, see note 6 to our consolidated financial statements.

Impairment, restructuring and other operating items, net

We recognized impairment, restructuring and other operating items, net, of (\$19.0 million) during 2021, as compared to \$97.4 million during 2020.

The 2021 amount primarily includes (i) a \$108.6 million gain related to the settlement of certain litigation in Switzerland, (ii) restructuring charges of \$58.2 million, including \$53.7 million of employee severance and termination costs related to certain reorganization activities, primarily in Switzerland, and (iii) direct acquisition and disposition costs of \$53.0 million, primarily related to costs incurred in connection with the formation of the VMO2 JV and the Sunrise Acquisition.

The 2020 amount primarily includes (i) direct acquisition and disposition costs of \$76.1 million, primarily related to costs incurred in connection with the Sunrise Acquisition and the formation of the VMO2 JV, (ii) restructuring charges of \$47.5 million, including \$34.9 million of employee severance and termination costs related to certain reorganization activities, primarily in Switzerland, the U.K. and Central and Other, (iii) a \$42.0 million gain in Belgium associated with the disposal of certain content assets and liabilities and (iv) impairment charges of \$13.2 million, primarily in Belgium and the U.K.

If, among other factors, (i) our equity values were to decline or (ii) the adverse impacts of economic, competitive, regulatory or other factors were to cause our results of operations or cash flows to be worse than anticipated, we could conclude in future periods that impairment charges are required in order to reduce the carrying values of our goodwill and, to a lesser extent, other long-lived assets. Any such impairment charges could be significant.

For additional information regarding our impairments, see *Critical Accounting Policies, Judgments and Estimates — Impairment of Property and Equipment and Intangible Assets* below.

Interest expense

We recognized interest expense of \$882.1 million and \$1,186.8 million during 2021 and 2020, respectively. Excluding the effects of FX, interest expense decreased \$349.8 million or 29.5% during 2021, as compared to 2020. This decrease is primarily attributable to (i) the impact of the U.K. JV Transaction and (ii) borrowings used to fund the Sunrise Acquisition, the net effect of which resulted in a lower average outstanding debt balance and a lower weighted average interest rate. For additional information regarding our outstanding indebtedness, see note 11 to our consolidated financial statements.

It is possible that the interest rates on (i) any new borrowings could be higher than the current interest rates on our existing indebtedness and (ii) our variable-rate indebtedness could increase in future periods. As further discussed in note 8 to our consolidated financial statements and under *Qualitative and Quantitative Disclosures about Market Risk* below, we use derivative instruments to manage our interest rate risks.

Realized and unrealized gains (losses) on derivative instruments, net

Our realized and unrealized gains or losses on derivative instruments include (i) unrealized changes in the fair values of our derivative instruments that are non-cash in nature until such time as the derivative contracts are fully or partially settled and (ii) realized gains or losses upon the full or partial settlement of the derivative contracts. The details of our realized and unrealized gains (losses) on derivative instruments, net, are as follows:

	Year ended December 31,	
	2021	2020
	in millions	
Cross-currency and interest rate derivative contracts (a)	\$ 578.9	\$ (1,184.3)
Equity-related derivative instruments:		
ITV Collar	(11.8)	364.2
Other	85.6	22.5
Total equity-related derivative instruments (b)	73.8	386.7
Foreign currency forward and option contracts	(31.8)	(81.1)
Other	2.0	—
Total	\$ 622.9	\$ (878.7)

(a) The gain during 2021 is attributable to net gains associated with changes in (i) certain market interest rates and (ii) the relative value of certain currencies. In addition, the gain during 2021 includes a net loss of \$10.7 million resulting from changes in our credit risk valuation adjustments. The loss during 2020 is attributable to net losses associated with changes in (a) the relative value of certain currencies and (b) certain market interest rates. In addition, the loss during 2020 includes a net gain of \$336.0 million resulting from changes in our credit risk valuation adjustments.

(b) For information concerning the factors that impact the valuations of our equity-related derivative instruments, see note 9 to our consolidated financial statements.

For additional information concerning our derivative instruments, see notes 8 and 9 to our consolidated financial statements and *Quantitative and Qualitative Disclosures about Market Risk* below.

Foreign currency transaction gains (losses), net

Our foreign currency transaction gains or losses primarily result from the remeasurement of monetary assets and liabilities that are denominated in currencies other than the underlying functional currency of the applicable entity. Unrealized foreign currency transaction gains or losses are computed based on period-end exchange rates and are non-cash in nature until such time as the amounts are settled. The details of our foreign currency transaction gain (losses), net, are as follows:

	Year ended December 31,	
	2021	2020
	<i>in millions</i>	
Intercompany payables and receivables denominated in a currency other than the entity's functional currency (a)	\$ 1,595.7	\$ (1,880.2)
U.S. dollar denominated debt issued by euro functional currency entities	(399.1)	435.0
U.S. dollar denominated debt issued by British pound sterling functional currency entities	246.2	50.7
Cash and restricted cash denominated in a currency other than the entity's functional currency	(101.1)	(134.1)
Euro denominated debt issued by British pound sterling functional currency entities	(24.1)	30.5
British pound sterling denominated debt issued by a U.S. dollar functional currency entity	—	88.9
Other	6.9	(0.1)
Total	<u>\$ 1,324.5</u>	<u>\$ (1,409.3)</u>

- (a) Amounts primarily relate to (i) loans between certain of our non-operating and operating subsidiaries in Europe, which generally are denominated in the currency of the applicable operating subsidiary, and (ii) loans between certain of our non-operating subsidiaries in the U.S. and Europe.

For information regarding how we manage our exposure to foreign currency risk, see *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

Realized and unrealized gains due to changes in fair values of certain investments and debt, net

Our realized and unrealized gains or losses due to changes in fair values of certain investments and debt include unrealized gains or losses associated with changes in fair values that are non-cash in nature until such time as these gains or losses are realized through cash transactions. For additional information regarding our investments, fair value measurements and debt, see notes 7, 9 and 11, respectively, to our consolidated financial statements. The details of our realized and unrealized gains due to changes in fair values of certain investments and debt, net, are as follows:

	<i>Year ended December 31,</i>	
	<i>2021</i>	<i>2020</i>
	<i>in millions</i>	
Investments:		
Univision	\$ 301.6	\$ —
Lacework	223.9	1.1
Plume	133.9	29.6
Skillz	(100.4)	238.0
Aviatrix	65.4	—
Lionsgate	33.9	4.0
EdgeConneX	28.9	33.1
ITV	15.3	(217.1)
Other, net (a)	32.5	(52.9)
Total investments	735.0	35.8
Debt	—	9.4
Total	\$ 735.0	\$ 45.2

(a) The 2021 amount includes gains of \$12.9 million related to investments that were sold during the year.

Losses on debt extinguishment, net

We recognized net losses on debt extinguishment of \$90.6 million and \$233.2 million during 2021 and 2020, respectively.

The loss during 2021 is attributable to (i) the write-off of \$77.7 million of unamortized deferred financing costs and discounts and (ii) the payment of \$12.9 million of redemption premiums.

The loss during 2020 is primarily attributable to (i) the payment of \$206.6 million of redemption premiums and (ii) the write-off of \$30.0 million of net unamortized deferred financing costs, discounts and premiums.

For additional information concerning our losses on debt extinguishment, net, see note 11 to our consolidated financial statements.

Share of results of affiliates, net

The following table sets forth the details of our share of results of affiliates, net:

	Year ended December 31,	
	2021	2020
	in millions	
VMO2 JV (a)	\$ (97.2)	\$ —
VodafoneZiggo JV (b)	(32.0)	(201.1)
All3Media	(17.4)	(27.9)
Atlas Edge JV	(5.8)	—
Formula E	(2.5)	(8.4)
Other	(20.5)	(7.9)
Total	\$ (175.4)	\$ (245.3)

- (a) Represents our 50% share of the results of operations of the VMO2 JV beginning June 1, 2021 and includes 100% of the share-based compensation expense associated with Liberty Global awards held by VMO2 JV employees who were formerly employees of Liberty Global, as these awards remain our responsibility. The summarized results of operations of the VMO2 JV for the period June 1, 2021 through December 31, 2021 are set forth below (in millions):

Revenue	\$ 8,522.9
Adjusted EBITDA	\$ 2,716.6
Operating income (1)	\$ 74.8
Non-operating expense (2)	\$ (311.5)
Net loss	\$ (164.9)

(1) Includes depreciation and amortization of \$2,551.2 million.

(2) Includes interest expense of \$568.6 million.

- (b) Represents the net effect of (i) interest income of \$56.5 million and \$48.0 million, respectively, representing 100% of the interest earned on the VodafoneZiggo JV Receivables and (ii) our 50% share of the results of operations of the VodafoneZiggo JV. The summarized results of operations of the VodafoneZiggo JV are set forth below:

	Year ended December 31,	
	2021	2020
	in millions	
Revenue	\$ 4,824.2	\$ 4,565.4
Adjusted EBITDA	\$ 2,265.6	\$ 2,142.0
Operating income (1)	\$ 351.2	\$ 283.7
Non-operating expense (2)	\$ (442.1)	\$ (570.9)
Net loss	\$ (163.1)	\$ (448.7)

(1) Includes depreciation and amortization of \$1,870.0 million and \$1,871.4 million, respectively.

(2) Includes interest expense of \$605.0 million and \$598.6 million, respectively.

For additional information regarding our equity method investments, see note 7 to our consolidated financial statements.

Gain on U.K. JV Transaction

In connection with the U.K. JV Transaction, we recognized a pre-tax gain during 2021 of \$10,873.8 million, net of the recognition of a cumulative foreign currency translation loss of \$1,198.6 million. For additional information, see note 6 to our consolidated financial statements.

Gain on Atlas Edge JV Transactions

In connection with the Atlas Edge JV Transactions, we recognized a pre-tax gain during 2021 of \$227.5 million, net of the recognition of a cumulative foreign currency translation loss of \$1.8 million. For additional information, see note 6 to our consolidated financial statements.

Other income, net

We recognized other income, net, of \$44.9 million and \$76.2 million during 2021 and 2020, respectively. These amounts include (i) credits related to the non-service components of our net periodic pension costs of \$38.9 million and \$16.7 million, respectively, (ii) interest and dividend income of \$13.9 million and \$57.1 million, respectively, and (iii) during 2020, a \$15.3 million gain related to certain assets that were contributed to a joint venture.

Income tax benefit (expense)

We recognized income tax benefit (expense) of (\$473.3 million) and \$275.9 million during 2021 and 2020, respectively.

The income tax expense during 2021 differs from the expected income tax expense of \$2,660.2 million (based on the U.K. statutory income tax rate of 19.0%), primarily due to the positive impact of the non-taxable gain associated with the U.K. JV Transaction.

The income tax benefit during 2020 differs from the expected income tax benefit of \$342.2 million (based on the U.K. statutory income tax rate of 19.0%), primarily due to the net negative impact of (i) non-deductible or non-taxable foreign currency exchange results and (ii) certain permanent differences between the financial and tax accounting treatment of items associated with investments in subsidiaries. The negative impact of these items was partially offset by the net positive impact of (a) the recognition of previously unrecognized tax benefits, (b) an increase in deferred tax assets in the U.K. due to an enacted change in tax law and (c) tax benefits associated with technology innovation incentives.

For additional information concerning our income taxes, see note 13 to our consolidated financial statements.

Earnings (loss) from continuing operations

During 2021 and 2020, we reported earnings (loss) from continuing operations of \$13,527.5 million and (\$1,525.1 million), respectively, consisting of (i) operating income of \$1,320.3 million and \$2,030.9 million, respectively, (ii) net non-operating income (expense) of \$12,680.5 million and (\$3,831.9 million), respectively, and (iii) income tax benefit (expense) of (\$473.3 million) and \$275.9 million, respectively.

Gains or losses associated with (i) changes in the fair values of derivative instruments, (ii) movements in foreign currency exchange rates and (iii) the disposition of assets and changes in ownership are subject to a high degree of volatility and, as such, any gains from these sources do not represent a reliable source of income. In the absence of significant gains in the future from these sources or from other non-operating items, our ability to achieve earnings is largely dependent on our ability to increase our aggregate operating income to a level that more than offsets the aggregate amount of our (a) interest expense, (b) other non-operating expenses and (c) income tax expense.

Due largely to the fact that we seek to maintain our debt at levels that provide for attractive equity returns, as discussed under *Material Changes in Financial Condition — Capitalization* below, we expect that we will continue to report significant levels of interest expense for the foreseeable future. For information concerning our expectations with respect to trends that may affect certain aspects of our operating results in future periods, see the discussion under *Overview* above. For information concerning the reasons for changes in specific line items in our consolidated statements of operations, see *Discussion and Analysis of our Reportable Segments and Discussion and Analysis of our Consolidated Operating Results* above.

Earnings from discontinued operations, net of taxes

We reported earnings from discontinued operations, net of taxes, of \$82.6 million and \$58.4 million during 2021 and 2020, respectively, representing the results of UPC Poland. For additional information, see note 6 to our consolidated financial statements.

Net earnings attributable to noncontrolling interests

Net earnings attributable to noncontrolling interests were \$183.3 million and \$161.3 million during 2021 and 2020, respectively, primarily attributable to the results of operations of Telenet.

2020 compared to 2019

For information regarding the discussion and analysis of our consolidated operating results during 2020, as compared to 2019, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2020 10-K.

Liquidity and Capital Resources

Sources and Uses of Cash

We are a holding company that is dependent on the capital resources of our subsidiaries to satisfy our liquidity requirements at the corporate level. Each of our significant operating subsidiaries is separately financed within one of our three subsidiary "borrowing groups." These borrowing groups include the respective restricted parent and subsidiary entities within UPC Holding, Telenet and VM Ireland. Although our borrowing groups typically generate cash from operating activities, the terms of the instruments governing the indebtedness of these borrowing groups may restrict our ability to access the liquidity of these subsidiaries. In addition, our ability to access the liquidity of these and other subsidiaries may be limited by tax and legal considerations, the presence of noncontrolling interests and other factors.

Cash and cash equivalents

The details of the U.S. dollar equivalent balances of our consolidated cash and cash equivalents at December 31, 2021 are set forth in the following table (in millions):

Cash and cash equivalents held by:

Liberty Global and unrestricted subsidiaries:

Liberty Global (a)	\$	1.7
Unrestricted subsidiaries (b)		730.4
Total Liberty Global and unrestricted subsidiaries		732.1

Borrowing groups (c):

Telenet		158.8
UPC Holding		19.3
VM Ireland		0.4
Total borrowing groups		178.5
Total cash and cash equivalents	\$	910.6

(a) Represents the amount held by Liberty Global on a standalone basis.

(b) Represents the aggregate amount held by subsidiaries that are outside of our borrowing groups.

(c) Represents the aggregate amounts held by the parent entity and restricted subsidiaries of our borrowing groups.

Liquidity of Liberty Global and its unrestricted subsidiaries

The \$1.7 million of cash and cash equivalents held by Liberty Global and, subject to certain tax and legal considerations, the \$730.4 million of aggregate cash and cash equivalents held by unrestricted subsidiaries, together with the \$2,801.3 million of investments held under SMAs, represented available liquidity at the corporate level at December 31, 2021. Our remaining cash and cash equivalents of \$178.5 million at December 31, 2021 were held by our borrowing groups, as set forth in the table above. As noted above, various factors may limit our ability to access the cash of our borrowing groups. For information regarding certain limitations imposed by our subsidiaries' debt instruments at December 31, 2021, see note 11 to our consolidated financial statements.

Our short-term sources of corporate liquidity include (i) cash and cash equivalents held by Liberty Global and, subject to certain tax and legal considerations, Liberty Global's unrestricted subsidiaries, (ii) investments held under SMAs, (iii) interest and dividend income received on our and, subject to certain tax and legal considerations, our unrestricted subsidiaries' cash and cash equivalents and investments, including dividends received from the VodafoneZiggo JV or the VMO2 JV, (iv) cash received with respect to transitional and other services provided to various third parties and (v) interest payments received with respect to the VodafoneZiggo JV Receivables.

From time to time, Liberty Global and its unrestricted subsidiaries may also receive (i) proceeds in the form of distributions or loan repayments from Liberty Global's borrowing groups or affiliates (including amounts from the VodafoneZiggo JV or the VMO2 JV) upon (a) the completion of recapitalizations, refinancings, asset sales or similar transactions by these entities or (b) the accumulation of excess cash from operations or other means, (ii) proceeds upon the disposition of investments and other assets of Liberty Global and its unrestricted subsidiaries, such as the pending sale of UPC Poland, and (iii) proceeds in connection with the incurrence of debt by Liberty Global or its unrestricted subsidiaries or the issuance of equity securities by Liberty Global, including equity securities issued to satisfy subsidiary obligations. No assurance can be given that any external funding would be available to Liberty Global or its unrestricted subsidiaries on favorable terms, or at all.

At December 31, 2021, our consolidated cash and cash equivalents balance included \$660.5 million held by entities that are domiciled outside of the U.K. Based on our assessment of our ability to access the liquidity of our subsidiaries on a tax efficient basis and our expectations with respect to our corporate liquidity requirements, we do not anticipate that tax considerations will adversely impact our corporate liquidity over the next 12 months. Our ability to access the liquidity of our subsidiaries on a tax efficient basis is a consideration in assessing the extent of our share repurchase program.

In addition, the amount of cash we receive from our subsidiaries to satisfy U.S. dollar-denominated liquidity requirements is impacted by fluctuations in exchange rates, particularly with regard to the translation of British pounds sterling and euros into U.S. dollars. In this regard, the strengthening (weakening) of the U.S. dollar against these currencies will result in decreases (increases) in the U.S. dollars received from the applicable subsidiaries to fund the repurchase of our equity securities and other U.S. dollar-denominated liquidity requirements.

Our short- and long-term corporate liquidity requirements include corporate general and administrative expenses and, from time to time, cash requirements in connection with (i) the repayment of third-party and intercompany debt, (ii) the satisfaction of contingent liabilities, (iii) acquisitions, (iv) the repurchase of equity and debt securities, (v) other investment opportunities, (vi) any funding requirements of our subsidiaries and affiliates or (vii) income tax payments. In addition, our parent entity uses available liquidity to make interest and principal payments on notes payable to certain of our unrestricted subsidiaries (aggregate outstanding principal of \$11.5 billion at December 31, 2021 with varying maturity dates).

During 2021, the aggregate amount of our share repurchases, including direct acquisition costs, was \$1,581.1 million. As a U.K. incorporated company, we may only elect to repurchase shares or pay dividends to the extent of our Distributable Reserves. Under our current repurchase program, we are authorized during 2022 to repurchase 10% of our total outstanding shares as of the beginning of the year. For additional information regarding our share repurchase programs, see note 14 to our consolidated financial statements.

Liquidity of borrowing groups

The cash and cash equivalents of our borrowing groups are detailed in the table above. In addition to cash and cash equivalents, the primary sources of liquidity of our borrowing groups are cash provided by operations and borrowing availability under their respective debt instruments. For the details of the borrowing availability of our borrowing groups at December 31, 2021, see note 11 to our consolidated financial statements. The aforementioned sources of liquidity may be supplemented in certain cases by contributions and/or loans from Liberty Global and its unrestricted subsidiaries.

The liquidity of our borrowing groups generally is used to fund (i) property and equipment additions, (ii) debt service requirements and (iii) income tax payments, as well as to settle certain obligations that are not included on our December 31, 2021 consolidated balance sheet. In this regard, we have significant commitments related to (a) programming, studio output and sports rights contracts, (b) certain operating costs associated with our networks and (c) purchase obligations associated with customer premises equipment and certain service-related commitments. These obligations are expected to represent a significant liquidity requirement of our borrowing groups, the majority of which is due over the next 12 to 24 months. For additional information regarding our commitments, see note 18 to our consolidated financial statements.

From time to time, our borrowing groups may also require liquidity in connection with (i) acquisitions and other investment opportunities, (ii) loans to Liberty Global, (iii) capital distributions to Liberty Global and other equity owners or (iv) the satisfaction of contingent liabilities. No assurance can be given that any external funding would be available to our borrowing groups on favorable terms, or at all.

For additional information regarding our consolidated cash flows, see the discussion under *Consolidated Statements of Cash Flows* below.

Capitalization

We seek to maintain our debt at levels that provide for attractive equity returns without assuming undue risk. In this regard, we generally seek to cause our operating subsidiaries to maintain their debt at levels that result in a consolidated debt balance (measured using subsidiary debt figures at swapped foreign currency exchange rates, consistent with the covenant calculation requirements of our subsidiary debt agreements) that is between four and five times our consolidated Adjusted EBITDA, although the timing of our acquisitions and financing transactions and the interplay of average and spot foreign currency rates may impact this ratio. Consolidated Adjusted EBITDA is a non-GAAP measure, which investors should view as a supplement to, and not a substitute for, GAAP measures of performance included in our consolidated statements of operations.

Our ability to service or refinance our debt and to maintain compliance with the leverage covenants in the credit agreements and indentures of our borrowing groups is dependent primarily on our ability to maintain or increase the Adjusted EBITDA of our operating subsidiaries and to achieve adequate returns on our property and equipment additions and acquisitions. In addition, our ability to obtain additional debt financing is limited by the incurrence-based leverage covenants contained in the various debt instruments of our borrowing groups. For example, if the Adjusted EBITDA of one of our borrowing groups were to decline, our ability to obtain additional debt could be limited. Under our credit facilities and senior and senior secured notes there is no cross-default risk between subsidiary borrowing groups in the event that one or more of our borrowing groups were to experience significant declines in their Adjusted EBITDA to the extent they were no longer able to service their debt obligations. Any mandatory prepayment events or events of default that may occur would only impact the relevant borrowing group in which these events occur and do not allow for any recourse to other borrowing groups or Liberty Global plc. Our credit facilities and senior and senior secured notes require that certain members of the relevant borrowing group guarantee the payment of all sums payable thereunder and such group members are required to grant first-ranking security over their shares or, in certain borrowing groups, over substantially all of their assets to secure the payment of all sums payable thereunder. At December 31, 2021, each of our borrowing groups was in compliance with its debt covenants. In addition, we do not anticipate any instances of non-compliance with respect to the debt covenants of our borrowing groups that would have a material adverse impact on our liquidity during the next 12 months.

At December 31, 2021, the outstanding principal amount of our consolidated debt, together with our finance lease obligations, aggregated \$14.9 billion, including \$0.9 billion that is classified as current on our consolidated balance sheet and \$13.7 billion that is not due until 2027 or thereafter. All of our consolidated debt and finance lease obligations have been borrowed or incurred by our subsidiaries at December 31, 2021.

We believe we have sufficient resources to repay or refinance the current portion of our debt and finance lease obligations and to fund our foreseeable liquidity requirements during the next 12 months. However, as our maturing debt grows in later years, we anticipate we will seek to refinance or otherwise extend our debt maturities. No assurance can be given that we will be able to complete these refinancing transactions or otherwise extend our debt maturities. In this regard, it is not possible to predict how political and economic conditions (including with respect to the COVID-19 pandemic), sovereign debt concerns or any adverse regulatory developments could impact the credit and equity markets we access and, accordingly, our future liquidity and financial position. Our ability to access debt financing on favorable terms, or at all, could be adversely impacted by (i) the financial failure of any of our counterparties, which could (a) reduce amounts available under committed credit facilities and (b) adversely impact our ability to access cash deposited with any failed financial institution, and (ii) tightening of the credit markets. In addition, any weakness in the equity markets could make it less attractive to use our shares to satisfy contingent or other obligations, and sustained or increased competition, particularly in combination with adverse economic or regulatory developments, could have an unfavorable impact on our cash flows and liquidity.

For additional information concerning our debt and finance lease obligations, see notes 11 and 12, respectively, to our consolidated financial statements.

Consolidated Statements of Cash Flows

General. Our cash flows are subject to significant variations due to FX. See related discussion under *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

Consolidated Statements of Cash Flows — 2021 compared to 2020

Summary. The 2021 and 2020 consolidated statements of cash flows of our continuing operations are summarized as follows:

	Year ended December 31,		Change
	2021	2020	
	in millions		
Net cash provided by operating activities	\$ 3,364.0	\$ 4,016.8	\$ (652.8)
Net cash used by investing activities	(5,745.5)	(8,817.2)	3,071.7
Net cash provided (used) by financing activities	(1,512.6)	1,104.5	(2,617.1)
Effect of exchange rate changes on cash and cash equivalents and restricted cash	(6.6)	141.0	(147.6)
Net decrease in cash and cash equivalents and restricted cash	<u>\$ (3,900.7)</u>	<u>\$ (3,554.9)</u>	<u>\$ (345.8)</u>

Operating Activities. The decrease in net cash provided by our operating activities is primarily attributable to the net effect of (i) a decrease in cash provided by our Adjusted EBITDA and related working capital items, including lower cash provided by receivables financing transactions, which decreased from \$272.1 million in 2020 to \$63.4 million in 2021, (ii) an increase in cash provided due to lower payments of interest, (iii) an increase in cash provided due to higher cash dividends received, primarily attributable to \$214.8 million received from the VMO2 JV during 2021, of which \$98.7 million was attributable to proceeds from securitization of certain handset receivables and various other transactions completed at the VMO2 JV, (iv) an increase due to FX, (v) an increase in cash provided due to lower payments for taxes and (vi) an increase in cash provided due to lower net cash receipts related to derivative instruments. Consolidated Adjusted EBITDA is a non-GAAP measure, which investors should view as a supplement to, and not a substitute for, GAAP measures of performance included in our consolidated statements of operations.

Investing Activities. The decrease in net cash used by our investing activities is primarily attributable to the net effect of (i) a decrease in cash used of \$5,197.0 million associated with lower net cash paid for acquisitions, primarily related to the Sunrise Acquisition, (ii) an increase in cash used of \$3,424.0 million associated with restricted cash contributed to the VMO2 JV in connection with the U.K. JV Transaction, (iii) a decrease in cash used of \$1,117.6 million associated with lower net cash paid for investments, primarily related to our investments held under SMAs, (iv) a decrease in cash used of \$144.5 million associated with cash received in connection with the Atlas Edge JV Transactions and (v) an increase in cash used of \$115.2 million due to higher capital expenditures. Capital expenditures increased from \$1,292.8 million during 2020 to \$1,408.0 million during 2021 due to the net effect of (a) a decrease due to the impact of the U.K. JV Transaction, (b) an increase due to the impact of the Sunrise Acquisition, (c) an increase in our net local currency capital expenditures and related working capital movements, including the impact of lower capital-related vendor financing, and (d) an increase due to FX.

The capital expenditures we report in our consolidated statements of cash flows do not include amounts that are financed under capital-related vendor financing or finance lease arrangements. Instead, these amounts are reflected as non-cash additions to our property and equipment when the underlying assets are delivered and as repayments of debt when the principal is repaid. In this discussion, we refer to (i) our capital expenditures as reported in our consolidated statements of cash flows, which exclude amounts financed under capital-related vendor financing or finance lease arrangements, and (ii) our total property and equipment additions, which include our capital expenditures on an accrual basis and amounts financed under capital-related vendor financing or finance lease arrangements. For further details regarding our property and equipment additions, see note 19 to our consolidated financial statements. A reconciliation of our consolidated property and equipment additions to our consolidated capital expenditures, as reported in our consolidated statements of cash flows, is set forth below:

	Year ended December 31,	
	2021	2020
	in millions	
Property and equipment additions	\$ 2,169.5	\$ 2,603.6
Assets acquired under capital-related vendor financing arrangements	(661.1)	(1,339.6)
Assets acquired under finance leases	(42.6)	(48.7)
Changes in current liabilities related to capital expenditures	(57.8)	77.5
Capital expenditures, net	<u>\$ 1,408.0</u>	<u>\$ 1,292.8</u>

The decrease in our property and equipment additions during 2021, as compared to 2020, is primarily due to the net effect of (i) a decrease due to the impact of the U.K. JV Transaction, (ii) an increase due to the impact of the Sunrise Acquisition, (iii) an increase in local currency expenditures of our subsidiaries due to the net effect of (a) an increase in baseline expenditures, (b) a decrease in expenditures for new build and upgrade projects, (c) an increase in expenditures to support new customer products and operational efficiency initiatives and (iv) an increase due to FX. During 2021 and 2020, our property and equipment additions represented 21.0% and 22.6% of revenue, respectively.

We expect our 2022 property and equipment additions to remain relatively stable as compared to our 2021 property and equipment additions (excluding the 2021 property and equipment additions of the U.K. JV Entities). The actual amount of our 2022 property and equipment additions may vary from our expectations for a variety of reasons, including (i) changes in (a) the competitive or regulatory environment, (b) business plans, (c) our expected future operating results or (d) foreign currency exchange rates and (ii) the availability of sufficient capital. Accordingly, no assurance can be given that our actual property and equipment additions will not vary materially from our expectations.

Financing Activities. The change in net cash provided (used) by our financing activities is primarily attributable to the net effect of (i) a decrease in cash of \$3,499.0 million due to lower net borrowings of debt, (ii) an increase in cash of \$1,125.2 million due to lower net repayments of vendor financing, (iii) a decrease in cash of \$508.1 million due to higher repurchases of Liberty Global ordinary shares and (iv) an increase in cash of \$266.7 million due to lower payments for financing costs and debt premiums.

Consolidated Statements of Cash Flows — 2020 compared to 2019

For information regarding the consolidated statements of cash flows of our continuing operations for 2020, as compared to 2019, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2020 10-K.

Adjusted Free Cash Flow

We define adjusted free cash flow as net cash provided by the operating activities of our continuing operations, plus operating-related vendor financed expenses (which represents an increase in the period to our actual cash available as a result of extending vendor payment terms beyond normal payment terms, which are typically 90 days or less, through non-cash financing activities), less (i) cash payments in the period for capital expenditures, (ii) principal payments on operating- and capital-related amounts financed by vendors and intermediaries (which represents a decrease in the period to our actual cash available as a result of paying amounts to vendors and intermediaries where we previously had extended vendor payments beyond the normal payment terms) and (iii) principal payments on finance leases (which represents a decrease in the period to our actual cash available), each as reported in our consolidated statements of cash flows with each item excluding any cash provided or used by our discontinued operations. Prior to the fourth quarter of 2021, our definition of adjusted free cash flow excluded cash payments for third-party costs directly associated with successful and unsuccessful acquisitions and dispositions. During the fourth quarter of 2021, we changed our definition of adjusted free cash flow to include these cash payments. Cash paid for third-party costs directly associated with successful and unsuccessful acquisitions and dispositions was \$80.5 million and \$34.7 million during 2021 and 2020, respectively. We believe our presentation of adjusted free cash flow, which is a non-GAAP measure, provides useful information to our investors because this measure can be used to gauge our ability to (a) service debt and (b) fund new investment opportunities after consideration of all actual cash payments related to our working capital activities and expenses that are capital in nature whether paid inside normal vendor payment terms or paid later outside normal vendor payment terms (in which case we typically pay in less than 365 days). Adjusted free cash flow should not be understood to represent our ability to fund discretionary amounts, as we have various mandatory and contractual obligations, including debt repayments, that are not deducted to arrive at these amounts. Investors should view adjusted free cash flow as a supplement to, and not a substitute for, GAAP measures of liquidity included in our consolidated statements of cash flows. Further, our adjusted free cash flow may differ from how other companies define and apply their definition of adjusted free cash flow.

The following table provides the details of our adjusted free cash flow:

	Year ended December 31,	
	2021	2020
	in millions	
Net cash provided by operating activities of our continuing operations	\$ 3,364.0	\$ 4,016.8
Operating-related vendor financing additions (a)	1,781.6	2,754.5
Cash capital expenditures, net	(1,408.0)	(1,292.8)
Principal payments on operating-related vendor financing	(1,408.0)	(2,381.7)
Principal payments on capital-related vendor financing	(964.4)	(2,088.8)
Principal payments on finance leases	(75.7)	(86.0)
Adjusted free cash flow	<u>\$ 1,289.5</u>	<u>\$ 922.0</u>

- (a) For purposes of our consolidated statements of cash flows, operating-related vendor financing additions represent operating-related expenses financed by an intermediary that are treated as constructive operating cash outflows and constructive financing cash inflows when the intermediary settles the liability with the vendor. When we pay the financing intermediary, we record financing cash outflows in our consolidated statements of cash flows. For purposes of our adjusted free cash flow definition, we (i) add in the constructive financing cash inflow when the intermediary settles the liability with the vendor as our actual net cash available at that time is not affected and (ii) subsequently deduct the related financing cash outflows when we actually pay the financing intermediary, reflecting the actual reduction to our cash available to service debt or fund new investment opportunities.

Critical Accounting Policies, Judgments and Estimates

In connection with the preparation of our consolidated financial statements, we make estimates and assumptions that affect the reported amounts of assets and liabilities, revenue and expenses and related disclosure of contingent assets and liabilities. Critical accounting policies are defined as those policies that are reflective of significant judgments, estimates and uncertainties, which would potentially result in materially different results under different assumptions and conditions. We believe the following accounting policies are critical in the preparation of our consolidated financial statements because of the judgment necessary to account for these matters and the significant estimates involved, which are susceptible to change:

- Impairment of property and equipment and intangible assets (including goodwill);
- Costs associated with construction and installation activities;
- Fair value measurements; and
- Income tax accounting.

We have discussed the selection of the aforementioned critical accounting policies with the audit committee of our board of directors. For additional information concerning our significant accounting policies, see note 3 to our consolidated financial statements.

Impairment of Property and Equipment and Intangible Assets

Carrying Value. The aggregate carrying value of our property and equipment and intangible assets (including goodwill) that was held for use comprised 40.2% of our total assets at December 31, 2021.

When circumstances warrant, we review the carrying amounts of our property and equipment and our intangible assets (other than goodwill and other indefinite-lived intangible assets) to determine whether such carrying amounts continue to be recoverable. Such changes in circumstance may include (i) an expectation of a sale or disposal of a long-lived asset or asset group, (ii) adverse changes in market or competitive conditions, (iii) an adverse change in legal factors or business climate in the markets in which we operate and (iv) operating or cash flow losses. For purposes of impairment testing, long-lived assets are grouped at the lowest level for which cash flows are largely independent of other assets and liabilities, generally at or below the reporting unit level (see below). If the carrying amount of the asset or asset group is greater than the expected undiscounted cash flows to be generated by such asset or asset group, an impairment adjustment is recognized. Such adjustment is measured by the amount that the carrying value of such asset or asset group exceeds its fair value. We generally measure fair value by considering (a) sale prices for similar assets, (b) discounted estimated future cash flows using an appropriate discount rate and/or (c) estimated replacement cost. Assets to be disposed of are recorded at the lower of their carrying amount or fair value less costs to sell.

We evaluate goodwill and other indefinite-lived intangible assets for impairment at least annually on October 1 and whenever facts and circumstances indicate that their carrying amounts may not be recoverable. For impairment evaluations with respect to both goodwill and other indefinite-lived intangibles, we first make a qualitative assessment to determine if the goodwill or other indefinite-lived intangible may be impaired. In the case of goodwill, if it is more-likely-than-not that a reporting unit's fair value is less than its carrying value, we then compare the fair value of the reporting unit to its respective carrying amount. Any excess of the carrying amount over the fair value would be charged to operations as an impairment loss. A reporting unit is an operating segment or one level below an operating segment (referred to as a "component"). With respect to other indefinite-lived intangible assets, if it is more-likely-than-not that the fair value of an indefinite-lived intangible asset is less than its carrying value, we then estimate its fair value and any excess of the carrying value over the fair value is also charged to operations as an impairment loss.

When required, considerable management judgment is necessary to estimate the fair value of reporting units and underlying long-lived and indefinite-lived assets. The equity of one of our reporting units, Telenet, is publicly traded in an active market. For this reporting unit, our fair value determination is based on quoted market prices. For other reporting units, we typically determine fair value using an income-based approach (discounted cash flows) based on assumptions in our long-range business plans and, in some cases, a combination of an income-based approach and a market-based approach. With respect to our discounted cash flow analysis used in the income-based approach, the timing and amount of future cash flows under these business plans require estimates of, among other items, subscriber growth and retention rates, rates charged per product, expected gross margins and Adjusted EBITDA margins and expected property and equipment additions. The development of these cash flows, and the discount rate applied to the cash flows, is subject to inherent uncertainties, and actual results could vary significantly from such estimates. Our determination of the discount rate is based on a weighted average cost

of capital approach, which uses a market participant's cost of equity and after-tax cost of debt and reflects the risks inherent in the cash flows. Based on the results of our 2021 qualitative assessment of our reporting unit carrying values, we determined that it was more-likely-than-not that fair value exceeded carrying value for all of our reporting units.

During the three years ended December 31, 2021, we did not record any significant impairment charges with respect to our property and equipment and intangible assets. For additional information regarding our long-lived assets, see note 10 to our consolidated financial statements.

If, among other factors, (i) our equity values were to decline or (ii) the adverse impacts of economic, competitive, regulatory or other factors were to cause our results of operations or cash flows to be worse than anticipated, we could conclude in future periods that impairment charges are required in order to reduce the carrying values of our goodwill and, to a lesser extent, other long-lived assets. Any such impairment charges could be significant.

Costs Associated with Construction and Installation Activities

We capitalize costs associated with the construction of new fixed and mobile transmission and distribution facilities and the installation of new fixed-line services. Installation activities that are capitalized include (i) the initial connection (or drop) from our fixed-line system to a customer location, (ii) the replacement of a drop and (iii) the installation of equipment for additional services, such as broadband internet or fixed-line services. The costs of other customer-facing activities, such as reconnecting customer locations where a drop already exists, disconnecting customer locations and repairing or maintaining drops, are expensed as incurred.

The nature and amount of labor and other costs to be capitalized with respect to construction and installation activities involves significant judgment. In addition to direct external and internal labor and materials, we also capitalize other costs directly attributable to our construction and installation activities, including dispatch costs, quality-control costs, vehicle-related costs and certain warehouse-related costs. The capitalization of these costs is based on time sheets, time studies, standard costs, call tracking systems and other verifiable means that directly link the costs incurred with the applicable capitalizable activity. We continuously monitor the appropriateness of our capitalization policies and update the policies when necessary to respond to changes in facts and circumstances, such as the development of new products and services and changes in the manner that installations or construction activities are performed.

Fair Value Measurements

GAAP provides guidance with respect to the recurring and nonrecurring fair value measurements and for a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. Level 1 inputs are quoted market prices in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date. Level 2 inputs are inputs other than quoted market prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. Level 3 inputs are unobservable inputs for the asset or liability.

Recurring Valuations. We perform recurring fair value measurements with respect to our derivative instruments and our fair value method investments. We use (i) cash flow valuation models to determine the fair values of our interest rate and foreign currency derivative instruments and (ii) a Black-Scholes option pricing model to determine the fair values of our equity-related derivative instruments. We use quoted market prices when available and, when not available, we use a combination of an income approach (discounted cash flows) and a market approach (market multiples of similar businesses) to determine the fair value of our fair value method investments. For a detailed discussion of the inputs we use to determine the fair value of our derivative instruments and fair value method investments, see note 9 to our consolidated financial statements. See also notes 7 and 8 to our consolidated financial statements for information concerning our fair value method investments and derivative instruments, respectively.

Changes in the fair values of our derivative instruments and fair value method investments have had, and we believe will continue to have, a significant and volatile impact on our results of operations. During 2021, 2020 and 2019, we recognized net gains (losses) of \$1,357.9 million, (\$833.5 million) and (\$121.2 million), respectively, attributable to changes in the fair values of these items.

As further described in note 9 to our consolidated financial statements, actual amounts received or paid upon the settlement or disposition of these investments and instruments may differ materially from the recorded fair values at December 31, 2021.

For information concerning the sensitivity of the fair value of certain of our more significant derivative instruments to changes in market conditions, see *Quantitative and Qualitative Disclosures About Market Risk — Sensitivity Information* below.

Nonrecurring Valuations. Our nonrecurring valuations are primarily associated with (i) the application of acquisition accounting, (ii) impairment assessments and (iii) the accounting for our initial investment in significant joint ventures, each of which require that we make fair value determinations as of the applicable valuation date. In making these determinations, we are required to make estimates and assumptions that affect the recorded amounts, including, but not limited to, expected future cash flows, market comparables and discount rates, remaining useful lives of long-lived assets, replacement or reproduction costs of property and equipment and the amounts to be recovered in future periods from acquired net operating losses and other deferred tax assets. To assist us in making these fair value determinations, we may engage third-party valuation specialists. Our estimates in this area impact, among other items, the amount of depreciation and amortization, impairment charges and income tax expense or benefit that we report. Our estimates of fair value are based upon assumptions we believe to be reasonable, but which are inherently uncertain. A significant portion of our long-lived assets were initially recorded through the application of acquisition accounting and all of our long-lived assets are subject to impairment assessments. For additional information, see note 9 to our consolidated financial statements. For information regarding our acquisitions and long-lived assets, see notes 5 and 10 to our consolidated financial statements, respectively.

Income Tax Accounting

We are required to estimate the amount of tax payable or refundable for the current year and the deferred tax assets and liabilities for the future tax consequences attributable to differences between the financial statement carrying amounts and income tax basis of assets and liabilities and the expected benefits of utilizing net operating loss and tax credit carryforwards, using enacted tax rates in effect for each taxing jurisdiction in which we operate for the year in which those temporary differences are expected to be recovered or settled. This process requires our management to make assessments regarding the timing and probability of the ultimate tax impact of such items.

Net deferred tax assets are reduced by a valuation allowance if we believe that it is more-likely-than-not such net deferred tax assets will not be realized. Establishing or reducing a tax valuation allowance requires us to make assessments about the timing of future events, including the probability of expected future taxable income and available tax planning strategies. At December 31, 2021, the aggregate valuation allowance provided against deferred tax assets was \$1,744.6 million. The actual amount of deferred income tax benefits realized in future periods will likely differ from the net deferred tax assets reflected in our December 31, 2021 consolidated balance sheet due to, among other factors, possible future changes in income tax law, or interpretations thereof, in the jurisdictions in which we operate and differences between estimated and actual future taxable income. Any such factors could have a material effect on our current and deferred tax positions as reported in our consolidated financial statements. A high degree of judgment is required to assess the impact of possible future outcomes on our current and deferred tax positions.

Tax laws in jurisdictions in which we have a presence are subject to varied interpretation, and many tax positions we take are subject to significant uncertainty regarding whether the position will be ultimately sustained after review by the relevant tax authority. We recognize the financial statement effects of a tax position when it is more-likely-than-not, based on technical merits, that the position will be sustained upon examination. The determination of whether the tax position meets the more-likely-than-not threshold requires a facts-based judgment using all information available. In a number of cases, we have concluded that the more-likely-than-not threshold is not met and, accordingly, the amount of tax benefit recognized in our consolidated financial statements is different than the amount taken or expected to be taken in our tax returns. As of December 31, 2021, the amount of unrecognized tax benefits for financial reporting purposes, but taken or expected to be taken in our tax returns, was \$447.1 million, of which \$378.7 million would have a favorable impact on our effective income tax rate if ultimately recognized, after considering amounts that we would expect to be offset by valuation allowances.

We are required to continually assess our tax positions, and the results of tax examinations or changes in judgment can result in substantial changes to our unrecognized tax benefits.

Item 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to market risk in the normal course of our business operations due to our investments in various foreign countries and ongoing investing and financing activities. Market risk refers to the risk of loss arising from adverse changes in foreign currency exchange rates, interest rates and stock prices. The risk of loss can be assessed from the perspective of adverse changes in fair values, cash flows and future earnings. As further described below, we have established policies, procedures and processes governing our management of market risks and the use of derivative instruments to manage our exposure to such risks.

Cash and Investments

We invest our cash in highly liquid instruments that meet high credit quality standards. We are exposed to exchange rate risk to the extent that the denominations of our cash and cash equivalent balances, revolving lines of credit and other short-term sources of liquidity do not correspond to the denominations of our and our subsidiaries' short-term liquidity requirements. In order to mitigate this risk, we actively manage the denominations of our cash balances in light of our and our subsidiaries' forecasted liquidity requirements. At December 31, 2021, \$468.8 million or 51.5%, \$387.3 million or 42.5% and \$36.9 million or 4.1% of our consolidated cash balances were denominated in U.S. dollars, euros and British pound sterling, respectively.

Foreign Currency Risk

We are exposed to foreign currency exchange rate risk with respect to our consolidated debt in situations where our debt is denominated in a currency other than the functional currency of the operations whose cash flows support our ability to repay or refinance such debt. Although we generally match the denomination of our and our subsidiaries' borrowings with the functional currency of the operations that are supporting the respective borrowings, market conditions or other factors may cause us to enter into borrowing arrangements that are not denominated in the functional currency of the underlying operations (unmatched debt). In these cases, our policy is to provide for an economic hedge against foreign currency exchange rate movements by using derivative instruments to synthetically convert unmatched debt into the applicable underlying currency. At December 31, 2021, substantially all of our debt was either directly or synthetically matched to the applicable functional currencies of the underlying operations. For additional information concerning the terms of our derivative instruments, see note 8 to our consolidated financial statements.

In addition to the exposure that results from the mismatch of our borrowings and underlying functional currencies, we are exposed to foreign currency risk to the extent that we enter into transactions denominated in currencies other than our or our subsidiaries' respective functional currencies (non-functional currency risk), such as equipment purchases, programming contracts, notes payable and notes receivable (including intercompany amounts). Changes in exchange rates with respect to amounts recorded on our consolidated balance sheets related to these items will result in unrealized (based upon period-end exchange rates) or realized foreign currency transaction gains and losses upon settlement of the transactions. Moreover, to the extent that our revenue, costs and expenses are denominated in currencies other than our respective functional currencies, we will experience fluctuations in our revenue, costs and expenses solely as a result of changes in foreign currency exchange rates. Generally, we will consider hedging non-functional currency risks when the risks arise from agreements with third parties that involve the future payment or receipt of cash or other monetary items to the extent that we can reasonably predict the timing and amount of such payments or receipts and the payments or receipts are not otherwise hedged. In this regard, we have entered into foreign currency forward contracts to hedge certain of these risks. For additional information concerning our foreign currency forward contracts, see note 8 to our consolidated financial statements.

We are also exposed to unfavorable and potentially volatile fluctuations of the U.S. dollar (our reporting currency) against the currencies of our operating subsidiaries when their respective financial statements are translated into U.S. dollars for inclusion in our consolidated financial statements. Cumulative translation adjustments are recorded in accumulated other comprehensive earnings or loss as a separate component of equity. Any increase (decrease) in the value of the U.S. dollar against any foreign currency that is the functional currency of one of our operating subsidiaries will cause us to experience unrealized foreign currency translation losses (gains) with respect to amounts already invested in such foreign currencies. Accordingly, we may experience a negative impact on our comprehensive earnings or loss and equity with respect to our holdings solely as a result of FX. Our primary exposure to FX risk during the three months ended December 31, 2021 was to the euro and Swiss franc, as 55.2% and 43.7% of our reported revenue during such period was derived from subsidiaries whose functional currencies are the euro and Swiss franc, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for other local currencies in Europe. We do not hedge against the risk that we may incur non-cash losses upon the translation of the financial statements of our subsidiaries and affiliates into U.S. dollars. For information regarding certain currency instability risks with respect to the British pound sterling and euro, see *Management's Discussion and Analysis of Financial Condition and Results of Operations — Overview* above.

The relationships between the primary currencies of the countries in which we operate and the U.S. dollar, which is our reporting currency, are shown below, per one U.S. dollar:

		As of December 31,		
		2021	2020	
Spot rates:				
Euro		0.8782	0.8180	
British pound sterling		0.7388	0.7325	
Swiss franc		0.9114	0.8852	
Polish zloty		4.0285	3.7363	
		Year ended December 31,		
		2021	2020	2019
Average rates:				
Euro		0.8455	0.8775	0.8933
British pound sterling		0.7269	0.7796	0.7835
Swiss franc		0.9139	0.9389	0.9937
Polish zloty		3.8595	3.8979	3.8388

Inflation and Foreign Investment Risk

We are subject to inflationary pressures with respect to labor, programming and other costs. In this regard, inflation rates in the countries in which we operate have recently increased, and in many countries such increases have been significant. While we attempt to increase our revenue to offset increases in costs, there is no assurance that we will be able to do so. Therefore, costs could rise faster than associated revenue, thereby resulting in a negative impact on our operating results, cash flows and liquidity. The economic environment in the respective countries in which we operate is a function of government, economic, fiscal and monetary policies and various other factors beyond our control that could lead to inflation. We are unable to predict the extent that price levels might be impacted in future periods by the current state of the economies in the countries in which we operate.

Interest Rate Risks

We are exposed to changes in interest rates primarily as a result of our borrowing activities, which include fixed-rate and variable-rate borrowings by our borrowing groups. Our primary exposure to variable-rate debt is through the EURIBOR-indexed and LIBOR-indexed debt of our borrowing groups and the variable-rate debt of certain of our other subsidiaries.

In general, we enter into derivative instruments to protect against increases in the interest rates on our variable-rate debt. Accordingly, we have entered into various derivative transactions to manage exposure to increases in interest rates. We use interest rate derivative contracts to exchange, at specified intervals, the difference between fixed and variable interest rates calculated by reference to an agreed-upon notional principal amount. From time to time we also use interest rate cap, floor and collar agreements and swaptions that lock in a maximum interest rate if variable rates rise, but also allow our company to benefit, to a limited extent in the case of collars, from declines in market rates. Under our current guidelines, we use various interest rate derivative instruments to mitigate interest rate risk. The final maturity dates of our various portfolios of interest rate derivative instruments might, in some instances, fall short of the respective maturities of the underlying variable-rate debt. In this regard, we use judgment to determine the appropriate composition and maturity dates of our portfolios of interest rate derivative instruments, taking into account the relative costs and benefits of different maturity profiles in light of current and expected future market conditions, liquidity issues and other factors. For additional information concerning the impacts of these interest rate derivative instruments, see note 8 to our consolidated financial statements.

In July 2017, the U.K. Financial Conduct Authority (the authority that regulates LIBOR) announced that it intends to stop compelling banks to submit rates for the calculation of LIBOR after 2021. Additionally, the European Money Markets Institute (the authority that administers EURIBOR) announced that measures would need to be undertaken by the end of 2021 to reform EURIBOR to ensure compliance with the E.U. Benchmarks Regulation. In November 2020, ICE Benchmark Administration (the entity that administers LIBOR) announced its intention to continue publishing USD LIBOR rates until June 30, 2023, with the exception of the one-week and two-month rates which, along with all CHF and GBP LIBOR rates, it ceased to publish after December 31, 2021. While this extension allows additional runway on existing contracts using USD LIBOR rates, companies

are still encouraged to transition away from using USD LIBOR as soon as practicable and should not enter into new contracts that use USD LIBOR after 2021. The methodology for EURIBOR has been reformed and EURIBOR has been granted regulatory approval to continue to be used. Currently, there is no consensus amongst loan borrowers and investors for what rate(s) should replace USD LIBOR.

In October 2020, the International Swaps and Derivatives Association (the **ISDA**) launched the *Fallback Supplement*, which, as of January 25, 2021, amended the standard definitions for interest rate derivatives to incorporate fallbacks for derivatives linked to certain key interbank offered rates (**IBORs**). The ISDA also launched the *Fallback Protocol*, a protocol that enables market participants to incorporate these revisions into their legacy non-cleared derivatives with other counterparties that choose to adhere to the protocol. The fallbacks for a particular currency apply following a permanent cessation of the IBOR in that currency, or in the case of a LIBOR setting, that LIBOR setting becoming permanently unrepresentative, and are adjusted versions of the risk-free rates identified in each currency. Our credit agreements contain provisions that contemplate alternative calculations of the base rate applicable to our LIBOR-indexed and EURIBOR-indexed debt to the extent LIBOR or EURIBOR (as applicable) are not available, which alternative calculations we do not anticipate will be materially different from what would have been calculated under LIBOR or EURIBOR (as applicable). Additionally, no mandatory prepayment or redemption provisions would be triggered under our credit agreements in the event that either the LIBOR rate or the EURIBOR rate is not available. It is possible, however, that any new reference rate that applies to our LIBOR-indexed or EURIBOR-indexed debt could be different from any new reference rate that applies to our LIBOR-indexed or EURIBOR-indexed derivative instruments. For discontinued currencies and tenors, we expect to continue taking steps to mitigate the changes in these benchmark rates, including by amending existing credit agreements and adhering to the *Fallback Protocol*, where appropriate. We plan to continue to manage this difference and any resulting increased variable-rate exposure through modifications to our debt and/or derivative instruments, however future market conditions may not allow immediate implementation of desired modifications and our subsidiaries may incur significant associated costs.

Weighted Average Variable Interest Rate. At December 31, 2021, the outstanding principal amount of our variable-rate indebtedness aggregated \$9.6 billion, and the weighted average interest rate (including margin) on such variable-rate indebtedness was approximately 2.7%, excluding the effects of interest rate derivative contracts, deferred financing costs, original issue premiums or discounts and commitment fees, all of which affect our overall cost of borrowing. Assuming no change in the amount outstanding, and without giving effect to any interest rate derivative contracts, deferred financing costs, original issue premiums or discounts and commitment fees, a hypothetical 50 basis point (0.50%) increase (decrease) in our weighted average variable interest rate would increase (decrease) our annual consolidated interest expense and cash outflows by \$48.0 million. As discussed above and in note 8 to our consolidated financial statements, we use interest rate derivative contracts to manage our exposure to increases in variable interest rates. In this regard, increases in the fair value of these contracts generally would be expected to offset most of the economic impact of increases in the variable interest rates applicable to our indebtedness to the extent and during the period that principal amounts are matched with interest rate derivative contracts.

Counterparty Credit Risk

We are exposed to the risk that the counterparties to the derivative instruments, undrawn debt facilities and cash investments of our subsidiary borrowing groups will default on their obligations to us. We manage these credit risks through the evaluation and monitoring of the creditworthiness of, and concentration of risk with, the respective counterparties. In this regard, credit risk associated with our derivative instruments and undrawn debt facilities is spread across a relatively broad counterparty base of banks and financial institutions. Collateral is generally not posted by either party under the derivative instruments of our subsidiary borrowing groups. Most of our cash currently is invested in either (i) AAA-rated money market funds, including funds that invest in government obligations, or (ii) overnight deposits with banks having a minimum credit rating of A by Standard & Poor's or an equivalent rating by Moody's Investor Service. To date, neither the access to nor the value of our cash and cash equivalent balances have been adversely impacted by liquidity problems of financial institutions.

At December 31, 2021, our exposure to counterparty credit risk included (i) derivative assets with an aggregate fair value of \$57.8 million, (ii) cash and cash equivalent and restricted cash balances of \$917.3 million and (iii) aggregate undrawn debt facilities of \$1,560.3 million.

Each of our subsidiary borrowing groups have entered into derivative instruments under master agreements with each counterparty that contain master netting arrangements that are applicable in the event of early termination by either party to such derivative instrument. The master netting arrangements are limited to the derivative instruments, and derivative-related debt instruments, governed by the relevant master agreement within each individual borrowing group and are independent of similar arrangements of our other subsidiary borrowing groups.

Under our derivative contracts, it is generally only the non-defaulting party that has a contractual option to exercise early termination rights upon the default of the other counterparty and to set off other liabilities against sums due upon such termination. However, in an insolvency of a derivative counterparty, under the laws of certain jurisdictions, the defaulting counterparty or its insolvency representatives may be able to compel the termination of one or more derivative contracts and trigger early termination payment liabilities payable by us, reflecting any mark-to-market value of the contracts for the counterparty. Alternatively, or in addition, the insolvency laws of certain jurisdictions may require the mandatory set off of amounts due under such derivative contracts against present and future liabilities owed to us under other contracts between us and the relevant counterparty. Accordingly, it is possible that we may be subject to obligations to make payments, or may have present or future liabilities owed to us partially or fully discharged by set off as a result of such obligations, in the event of the insolvency of a derivative counterparty, even though it is the counterparty that is in default and not us. To the extent that we are required to make such payments, our ability to do so will depend on our liquidity and capital resources at the time. In an insolvency of a defaulting counterparty, we will be an unsecured creditor in respect of any amount owed to us by the defaulting counterparty, except to the extent of the value of any collateral we have obtained from that counterparty.

In addition, where a counterparty is in financial difficulty, under the laws of certain jurisdictions, the relevant regulators may be able to (i) compel the termination of one or more derivative instruments, determine the settlement amount and/or compel, without any payment, the partial or full discharge of liabilities arising from such early termination that are payable by the relevant counterparty or (ii) transfer the derivative instruments to an alternative counterparty.

While we currently have no specific concerns about the creditworthiness of any counterparty for which we have material credit risk exposures, we cannot rule out the possibility that one or more of our counterparties could fail or otherwise be unable to meet its obligations to us. Any such instance could have an adverse effect on our cash flows, results of operations, financial condition and/or liquidity.

Although we actively monitor the creditworthiness of our key vendors, the financial failure of a key vendor could disrupt our operations and have an adverse impact on our revenue and cash flows.

Sensitivity Information

Information concerning the sensitivity of the fair value of certain of our more significant derivative instruments to changes in market conditions is set forth below. The potential changes in fair value set forth below do not include any amounts associated with the remeasurement of the derivative asset or liability into the applicable functional currency. For additional information, see notes 8 and 9 to our consolidated financial statements.

UPC Holding Cross-currency and Interest Rate Derivative Contracts

Holding all other factors constant, at December 31, 2021:

- (i) an instantaneous increase (decrease) of 10% in the value of the Swiss franc relative to the U.S. dollar would have decreased (increased) the aggregate fair value of the UPC Holding cross-currency and interest rate derivative contracts by approximately €455 million (\$518 million);
- (ii) an instantaneous increase (decrease) of 10% in the value of the Swiss franc and Polish zloty relative to the euro would have decreased (increased) the aggregate fair value of the UPC Holding cross-currency and interest rate derivative contracts by approximately €338 million (\$385 million); and
- (iii) an instantaneous increase (decrease) in the relevant base rate of 50 basis points (0.50%) would have decreased (increased) the aggregate fair value of the UPC Holding cross-currency and interest rate derivative contracts by approximately €112 million (\$128 million).

Telenet Cross-currency and Interest Rate Derivative Contracts

Holding all other factors constant, at December 31, 2021:

- (i) an instantaneous increase (decrease) of 10% in the value of the euro relative to the U.S. dollar would have decreased (increased) the aggregate fair value of the Telenet cross-currency and interest rate derivative contracts by approximately €343 million (\$390 million); and

- (ii) an instantaneous increase (decrease) in the relevant base rate of 50 basis points (0.50%) would have decreased (increased) the aggregate fair value of the Telenet cross-currency and interest rate derivative contracts by approximately €83 million (\$95 million).

Projected Cash Flows Associated with Derivative Instruments

The following table provides information regarding the projected cash flows associated with our derivative instruments. The U.S. dollar equivalents presented below are based on interest rate projections and exchange rates as of December 31, 2021. These amounts are presented for illustrative purposes only and will likely differ from the actual cash payments or receipts required in future periods. For additional information regarding our derivative instruments, see note 8 to our consolidated financial statements. For information concerning the counterparty credit risk associated with our derivative instruments, see the discussion under *Counterparty Credit Risk* above.

	Payments (receipts) due during:						Total
	2022	2023	2024	2025	2026	Thereafter	
	in millions						
Projected derivative cash payments (receipts), net:							
Interest-related (a)	\$ (36.4)	\$ 65.1	\$ (106.0)	\$ (161.5)	\$ (77.0)	\$ (208.5)	\$ (524.3)
Principal-related (b)	—	63.2	4.4	106.8	22.2	81.5	278.1
Other (c)	18.3	—	—	—	—	—	18.3
Total	<u>\$ (18.1)</u>	<u>\$ 128.3</u>	<u>\$ (101.6)</u>	<u>\$ (54.7)</u>	<u>\$ (54.8)</u>	<u>\$ (127.0)</u>	<u>\$ (227.9)</u>

- (a) Includes (i) the cash flows of our interest rate cap, floor and swap contracts and (ii) the interest-related cash flows of our cross-currency and interest rate swap contracts.
- (b) Includes the principal-related cash flows of our cross-currency swap contracts.
- (c) Includes amounts related to foreign currency forward contracts.

Item 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The consolidated financial statements of Liberty Global are filed under this Item, beginning on page II-43. Financial statement schedules are filed under Item 15 of this Annual Report on Form 10-K.

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***

In accordance with Exchange Act Rule 13a-15, we carried out an evaluation, under the supervision and with the participation of management, including our chief executive officer and chief financial officer (the **Executives**), of the effectiveness of our disclosure controls and procedures as of December 31, 2021. In designing and evaluating the disclosure controls and procedures, the Executives recognize that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management is necessarily required to apply judgment in evaluating the cost-benefit relationship of possible controls and objectives. Based on that evaluation, the Executives concluded that our disclosure controls and procedures are effective as of December 31, 2021, to provide reasonable assurance that information required to be disclosed in our reports filed or submitted under the Securities Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms.

Internal control over financial reporting***(a) Management's Annual Report on Internal Control over Financial Reporting***

Management's annual report on internal control over financial reporting is included herein on page II-41.

(b) Audit Report of the Independent Registered Public Accounting Firm

The audit report of KPMG LLP is included herein on page II-42.

(c) Changes in Internal Control over Financial Reporting

There have been no changes in our internal controls over financial reporting identified in connection with the evaluation described above that occurred during the fourth fiscal quarter covered by this Annual Report on Form 10-K that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. OTHER INFORMATION

Not applicable.

Item 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) of the Securities Exchange Act of 1934. Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. 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.

Our management assessed the effectiveness of internal control over financial reporting as of December 31, 2021, using the criteria in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, our management believes that our internal control over financial reporting was effective as of December 31, 2021. The effectiveness of our internal control over financial reporting has been audited by KPMG LLP, an independent registered public accounting firm, as stated in their report included herein.

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Liberty Global plc:

Opinion on Internal Control Over Financial Reporting

We have audited Liberty Global plc and subsidiaries' (the Company) internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive earnings, equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes and financial statement schedules I and II (collectively, the consolidated financial statements), and our report dated February 17, 2022 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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.

/s/ KPMG LLP

Denver, Colorado
February 17, 2022

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Liberty Global plc:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Liberty Global plc and subsidiaries (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive earnings, equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes and financial statement schedules I to II (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated February 17, 2022 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the 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 audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits 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. We believe that our audits provide a reasonable basis for our opinion.

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: (1) relate to accounts or disclosures that are material to the consolidated financial statements and (2) 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.

Capitalization of external costs

As discussed in Notes 3 and 10 to the consolidated financial statements, the Company capitalizes certain external costs for construction and installation activities and internal use software. Capitalized external costs for construction and installation activities and internal use software are recorded within property and equipment, net which has a balance of \$6,981.5 million as of December 31, 2021.

We identified the assessment of the capitalization of external costs for construction and installation activities and internal use software as a critical audit matter. Assessing the Company's determination of which costs qualify for capitalization or expense required a high degree of auditor judgment to evaluate the nature of the supporting documentation.

The following are the primary procedures we performed to address this critical audit matter. We applied auditor judgment to determine the nature of procedures to be performed over the capitalization of external costs for construction and installation activities and internal use software. This included comparing the external costs capitalized in the current year for construction and installation activities and internal use software to the historical external costs capitalized, considering the nature of the Company's business activities, to identify, for further investigation, inconsistent trends or unexpected patterns of capitalization. We evaluated the design and tested the operating effectiveness of certain internal controls related to the capitalization of external costs for construction and installation activities and internal use software. This included controls related to (1) the Company's identification of qualifying capital external costs and (2) the Company's review of the nature of the underlying activity. We selected a sample of capitalized external costs in the current year and independently assessed the Company's determination that such costs qualify for capitalization by investigating the nature of the costs based on underlying third-party documentation such as project documentation, vendor contracts and invoices.

Fair value measurement of the initial investment in the VMO2 JV

As discussed in Notes 6 and 9 to the consolidated financial statements, the Company acquired a 50% interest in a joint venture with Telefónica SA (the VMO2 JV) on June 1, 2021 in exchange for its contribution of Virgin Media Inc.'s United Kingdom operations and certain other of the Company's subsidiaries. The Company estimated the fair value of the VMO2 JV using a discounted cash flow analysis, and based on the estimated fair value, the Company recorded its initial equity method investment of \$14,670.8 million for the VMO2 JV.

We identified the evaluation of the fair value measurement of the initial investment in the VMO2 JV as a critical audit matter. Evaluating the projected revenue growth rates, EBITDA margins, discount rate, and terminal growth rate used to estimate the fair value of the initial investment in the VMO2 JV required a higher degree of auditor judgment due to the subjective nature of the assumptions. Additionally, addressing the matter required specialized skills and knowledge.

The following are the primary procedures we performed to address this critical audit matter. We performed sensitivity analyses to assess the impact of possible changes to certain assumptions on the fair value measurement. We evaluated the design and tested the operating effectiveness of certain internal controls over the Company's fair value measurement process related to the valuation of the initial investment in the VMO2 JV, including controls related to the development of the above assumptions. We evaluated the projected revenue growth rates used by the Company by comparing them to historical average growth rates, and publicly available industry and market data. We assessed the projected EBITDA margins by comparing them to historical EBITDA margins and publicly available industry and market data. We involved valuation professionals with specialized skills and knowledge, who assisted in:

- evaluating the discount rate by comparing it to an independently developed range using publicly available market data for comparable entities
- evaluating the terminal growth rate by comparing it to publicly available market data
- evaluating the fair value of the initial investment derived from the assumptions above by comparing the implied market multiple from the Company's fair value estimates to the observed range of market multiples derived from comparable entities.

/s/ KPMG LLP

We have served as the Company's auditor since 2004.

Denver, Colorado
February 17, 2022

LIBERTY GLOBAL PLC
CONSOLIDATED BALANCE SHEETS

	December 31,	
	2021	2020
	in millions	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 910.6	\$ 1,327.2
Trade receivables, net	907.3	1,078.4
Short-term investments (measured at fair value on a recurring basis) (note 7)	2,269.6	1,600.2
Current assets of discontinued operations (note 6)	925.0	980.1
Other current assets (notes 4, 6, 7 and 8)	928.0	816.5
Total current assets	5,940.5	5,802.4
Investments and related notes receivable (including \$2,757.8 million and \$1,865.8 million, respectively, measured at fair value on a recurring basis) (note 7)	19,703.0	5,354.5
Property and equipment, net (notes 10 and 12)	6,981.5	7,626.6
Goodwill (note 10)	9,523.4	9,965.7
Intangible assets subject to amortization, net (note 10)	2,342.5	2,879.9
Assets held for sale (note 6)	—	24,282.7
Other assets, net (notes 4, 6, 8, 12 and 13)	2,426.1	3,180.9
Total assets	\$ 46,917.0	\$ 59,092.7

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
CONSOLIDATED BALANCE SHEETS — (Continued)

	December 31,	
	2021	2020
	in millions	
LIABILITIES AND EQUITY		
Current liabilities:		
Accounts payable	\$ 613.4	\$ 579.1
Deferred revenue (note 4)	274.7	426.9
Current portion of debt and finance lease obligations (notes 11 and 12)	850.3	1,086.1
Accrued capital expenditures	257.7	204.2
Accrued income taxes	236.6	252.7
Derivative instruments (note 8)	221.8	252.7
Current liabilities of discontinued operations (note 6)	201.3	187.5
Other accrued and current liabilities (note 12)	1,429.0	1,521.9
Total current liabilities	4,084.8	4,511.1
Long-term debt and finance lease obligations (notes 11 and 12)	13,974.8	13,861.3
Liabilities associated with assets held for sale (note 6)	—	23,197.2
Long-term operating lease liabilities	1,226.1	1,255.4
Other long-term liabilities (notes 4, 8, 13 and 16)	2,033.3	2,969.3
Total liabilities	21,319.0	45,794.3
Commitments and contingencies (notes 8, 11, 13, 16 and 18)		
Equity (note 14):		
Liberty Global shareholders:		
Class A ordinary shares, \$0.01 nominal value. Issued and outstanding 174,310,558 and 181,348,114 shares, respectively	1.8	1.8
Class B ordinary shares, \$0.01 nominal value. Issued and outstanding 12,930,839 and 12,561,444 shares, respectively	0.1	0.1
Class C ordinary shares, \$0.01 nominal value. Issued and outstanding 340,114,729 and 386,588,921 shares, respectively	3.4	3.9
Additional paid-in capital	3,893.0	5,271.7
Accumulated earnings	18,144.5	4,692.1
Accumulated other comprehensive earnings, net of taxes	3,892.2	3,693.1
Treasury shares, at cost	(0.1)	(0.1)
Total Liberty Global shareholders	25,934.9	13,662.6
Noncontrolling interests	(336.9)	(364.2)
Total equity	25,598.0	13,298.4
Total liabilities and equity	\$ 46,917.0	\$ 59,092.7

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF OPERATIONS

	Year ended December 31,		
	2021	2020	2019
	in millions, except per share amounts		
Revenue (notes 4, 6, 7 and 19)	\$ 10,311.3	\$ 11,545.4	\$ 11,115.8
Operating costs and expenses (exclusive of depreciation and amortization, shown separately below):			
Programming and other direct costs of services	3,017.6	3,320.6	3,130.8
Other operating (note 15)	1,484.6	1,719.3	1,579.2
Selling, general and administrative (SG&A) (note 15)	2,154.1	2,150.0	2,044.2
Depreciation and amortization (note 10)	2,353.7	2,227.2	3,546.3
Impairment, restructuring and other operating items, net (notes 5 and 16)	(19.0)	97.4	155.4
	8,991.0	9,514.5	10,455.9
Operating income	1,320.3	2,030.9	659.9
Non-operating income (expense):			
Interest expense	(882.1)	(1,186.8)	(1,384.2)
Realized and unrealized gains (losses) on derivative instruments, net (note 8)	622.9	(878.7)	(193.2)
Foreign currency transaction gains (losses), net	1,324.5	(1,409.3)	(95.6)
Realized and unrealized gains due to changes in fair values of certain investments and debt, net (notes 7, 9 and 11)	735.0	45.2	72.0
Losses on debt extinguishment, net (note 11)	(90.6)	(233.2)	(216.7)
Share of results of affiliates, net (note 7)	(175.4)	(245.3)	(198.5)
Gain on U.K. JV Transaction (note 6)	10,873.8	—	—
Gain on Atlas Edge JV Transactions (note 6)	227.5	—	—
Other income, net	44.9	76.2	114.4
	12,680.5	(3,831.9)	(1,901.8)
Earnings (loss) from continuing operations before income taxes	14,000.8	(1,801.0)	(1,241.9)
Income tax benefit (expense) (note 13)	(473.3)	275.9	(234.0)
Earnings (loss) from continuing operations	13,527.5	(1,525.1)	(1,475.9)
Discontinued operations (note 6):			
Earnings from discontinued operations, net of taxes	82.6	58.4	797.2
Gain on disposal of discontinued operations, net of taxes	—	—	12,316.9
	82.6	58.4	13,114.1
Net earnings (loss)	13,610.1	(1,466.7)	11,638.2
Net earnings attributable to noncontrolling interests	(183.3)	(161.3)	(116.8)
Net earnings (loss) attributable to Liberty Global shareholders	\$ 13,426.8	\$ (1,628.0)	\$ 11,521.4
Basic earnings (loss) attributable to Liberty Global shareholders per share (note 3):			
Continuing operations	\$ 24.01	\$ (2.80)	\$ (2.26)
Discontinued operations (note 6)	0.15	0.10	18.58
	\$ 24.16	\$ (2.70)	\$ 16.32
Diluted earnings (loss) attributable to Liberty Global shareholders per share (note 3):			
Continuing operations	\$ 23.45	\$ (2.80)	\$ (2.26)
Discontinued operations (note 6)	0.14	0.10	18.58
	\$ 23.59	\$ (2.70)	\$ 16.32

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF COMPREHENSIVE EARNINGS

	Year ended December 31,		
	2021	2020	2019
	<i>in millions</i>		
Net earnings (loss)	\$ 13,610.1	\$ (1,466.7)	\$ 11,638.2
Other comprehensive earnings, net of taxes (note 17):			
Continuing operations:			
Foreign currency translation adjustments	(1,069.8)	2,586.2	445.0
Reclassification adjustment included in net earnings (loss) (note 6)	1,249.3	(1.5)	(1.3)
Pension-related adjustments and other	80.7	(17.2)	(13.1)
Other comprehensive earnings from continuing operations	260.2	2,567.5	430.6
Other comprehensive earnings (loss) from discontinued operations (note 6)	(59.9)	13.5	51.5
Other comprehensive earnings	200.3	2,581.0	482.1
Comprehensive earnings	13,810.4	1,114.3	12,120.3
Comprehensive earnings attributable to noncontrolling interests	(184.5)	(161.9)	(118.0)
Comprehensive earnings attributable to Liberty Global shareholders	\$ 13,625.9	\$ 952.4	\$ 12,002.3

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF EQUITY

	Liberty Global shareholders											
	Ordinary shares			Additional paid-in capital	Accumulated earnings (deficit)	Accumulated other comprehensive earnings, net of taxes	Treasury shares, at cost	Total Liberty Global shareholders	Non- controlling interests	Total equity		
	Class A	Class B	Class C									
	in millions											
Balance at January 1, 2019	\$ 2.0	\$ 0.1	\$ 5.3	\$ 9,214.5	\$ (5,171.0)	\$ 631.8	\$ (0.1)	\$ 4,682.6	\$ (533.1)	\$ 4,149.5		
Net earnings	—	—	—	—	11,521.4	—	—	11,521.4	116.8	11,638.2		
Other comprehensive earnings, net of taxes (note 17)	—	—	—	—	—	480.9	—	480.9	1.2	482.1		
Repurchases and cancellations of Liberty Global ordinary shares (note 14)	(0.2)	—	(0.9)	(3,219.1)	—	—	—	(3,220.2)	—	(3,220.2)		
Share-based compensation (note 15)	—	—	—	250.1	—	—	—	250.1	—	250.1		
Repurchases by Telenet of its outstanding shares	—	—	—	(134.5)	—	—	—	(134.5)	20.4	(114.1)		
Adjustments due to changes in subsidiaries' equity and other, net	—	—	—	25.9	—	—	—	25.9	(12.9)	13.0		
Balance at December 31, 2019	\$ 1.8	\$ 0.1	\$ 4.4	\$ 6,136.9	\$ 6,350.4	\$ 1,112.7	\$ (0.1)	\$ 13,606.2	\$ (407.6)	\$13,198.6		

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF EQUITY — (Continued)

	Liberty Global shareholders									
	Ordinary shares			Additional paid-in capital	Accumulated earnings	Accumulated other comprehensive earnings, net of taxes	Treasury shares, at cost	Total Liberty Global shareholders	Non- controlling interests	Total equity
	Class A	Class B	Class C							
	in millions									
Balance at January 1, 2020, before effect of accounting change	\$ 1.8	\$ 0.1	\$ 4.4	\$ 6,136.9	\$ 6,350.4	\$ 1,112.7	\$ (0.1)	\$ 13,606.2	\$ (407.6)	\$13,198.6
Impact of ASU No. 2016-13 (note 2)	—	—	—	—	(30.3)	—	—	(30.3)	0.2	(30.1)
Balance at January 1, 2020, as adjusted for accounting change	1.8	0.1	4.4	6,136.9	6,320.1	1,112.7	(0.1)	13,575.9	(407.4)	13,168.5
Net loss	—	—	—	—	(1,628.0)	—	—	(1,628.0)	161.3	(1,466.7)
Other comprehensive earnings, net of taxes (note 17)	—	—	—	—	—	2,580.4	—	2,580.4	0.6	2,581.0
Repurchases and cancellations of Liberty Global ordinary shares (note 14)	—	—	(0.5)	(1,071.8)	—	—	—	(1,072.3)	—	(1,072.3)
Share-based compensation (note 15)	—	—	—	261.7	—	—	—	261.7	—	261.7
Distributions by subsidiaries to noncontrolling interest owners (note 14)	—	—	—	—	—	—	—	—	(139.2)	(139.2)
Repurchases by Telenet of its outstanding shares	—	—	—	(45.3)	—	—	—	(45.3)	7.2	(38.1)
Adjustments due to changes in subsidiaries' equity and other, net	—	—	—	(9.8)	—	—	—	(9.8)	13.3	3.5
Balance at December 31, 2020	\$ 1.8	\$ 0.1	\$ 3.9	\$ 5,271.7	\$ 4,692.1	\$ 3,693.1	\$ (0.1)	\$ 13,662.6	\$ (364.2)	\$13,298.4

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF EQUITY — (Continued)

	Liberty Global shareholders									
	Ordinary shares			Additional paid-in capital	Accumulated earnings	Accumulated other comprehensive earnings, net of taxes	Treasury shares, at cost	Total Liberty Global shareholders	Non- controlling interests	Total equity
	Class A	Class B	Class C							
	in millions									
Balance at January 1, 2021	\$ 1.8	\$ 0.1	\$ 3.9	\$ 5,271.7	\$ 4,692.1	\$ 3,693.1	\$ (0.1)	\$ 13,662.6	\$ (364.2)	\$13,298.4
Net earnings	—	—	—	—	13,426.8	—	—	13,426.8	183.3	13,610.1
Other comprehensive earnings, net of taxes (note 17)	—	—	—	—	—	199.1	—	199.1	1.2	200.3
Repurchases and cancellations of Liberty Global ordinary shares (note 14)	—	—	(0.5)	(1,580.6)	—	—	—	(1,581.1)	—	(1,581.1)
Share-based compensation (note 15)	—	—	—	257.9	—	—	—	257.9	—	257.9
Distributions by subsidiaries to noncontrolling interest owners (note 14)	—	—	—	—	—	—	—	—	(141.8)	(141.8)
Repurchases by Telenet of its outstanding shares	—	—	—	(16.9)	—	—	—	(16.9)	1.6	(15.3)
Adjustments due to changes in subsidiaries' equity and other, net	—	—	—	(39.1)	25.6	—	—	(13.5)	(17.0)	(30.5)
Balance at December 31, 2021	\$ 1.8	\$ 0.1	\$ 3.4	\$ 3,893.0	\$ 18,144.5	\$ 3,892.2	\$ (0.1)	\$ 25,934.9	\$ (336.9)	\$25,598.0

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year ended December 31,		
	2021	2020	2019
	in millions		
Cash flows from operating activities:			
Net earnings (loss)	\$ 13,610.1	\$ (1,466.7)	\$ 11,638.2
Earnings from discontinued operations	82.6	58.4	13,114.1
Earnings (loss) from continuing operations	13,527.5	(1,525.1)	(1,475.9)
Adjustments to reconcile earnings (loss) from continuing operations to net cash provided by operating activities of continuing operations:			
Share-based compensation expense	308.1	348.0	305.8
Depreciation and amortization	2,353.7	2,227.2	3,546.3
Impairment, restructuring and other operating items, net	(19.0)	97.4	155.4
Amortization of deferred financing costs and non-cash interest	31.9	44.8	53.7
Realized and unrealized losses (gains) on derivative instruments, net	(622.9)	878.7	193.2
Foreign currency transaction losses (gains), net	(1,324.5)	1,409.3	95.6
Realized and unrealized gains due to changes in fair values of certain investments and debt, net	(735.0)	(45.2)	(72.0)
Losses on debt extinguishment, net	90.6	233.2	216.7
Share of results of affiliates, net	175.4	245.3	198.5
Deferred income tax expense (benefit)	318.2	(262.9)	64.5
Gain on U.K. JV Transaction	(10,873.8)	—	—
Gain on Atlas Edge JV Transactions	(227.5)	—	—
Changes in operating assets and liabilities, net of the effects of acquisitions and dispositions:			
Receivables and other operating assets	707.1	947.3	877.0
Payables and accruals	(872.3)	(830.7)	(795.4)
Dividends received from the VodafoneZiggo JV	311.7	249.5	162.7
Dividends received from the VMO2 JV	214.8	—	—
Net cash provided by operating activities of continuing operations	3,364.0	4,016.8	3,526.1
Net cash provided by operating activities of discontinued operations	185.0	169.0	1,059.3
Net cash provided by operating activities	\$ 3,549.0	\$ 4,185.8	\$ 4,585.4

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF CASH FLOWS — (Continued)

	Year ended December 31,		
	2021	2020	2019
	<i>in millions</i>		
Cash flows from investing activities:			
Cash paid for investments	\$ (7,261.8)	\$ (8,240.5)	\$ (256.1)
Cash received from the sale of investments	6,170.8	6,031.9	—
Cash and restricted cash contributed to the VMO2 JV in connection with the U.K. JV Transaction	(3,424.0)	—	—
Capital expenditures, net	(1,408.0)	(1,292.8)	(1,168.2)
Cash released from (used to fund) the Vodafone Escrow Accounts, net	214.9	104.9	(295.2)
Net cash received in connection with the Atlas Edge JV Transactions	144.5	—	—
Loans to the VodafoneZiggo JV	(123.0)	(122.7)	—
Net cash received in connection with the U.K. JV Transaction	108.6	—	—
Cash paid in connection with acquisitions, net of cash acquired	(70.8)	(5,267.8)	(23.1)
Proceeds received upon disposition of discontinued operations, net	—	—	11,203.1
Other investing activities, net	(96.7)	(30.2)	154.6
Net cash provided (used) by investing activities of continuing operations	(5,745.5)	(8,817.2)	9,615.1
Net cash used by investing activities of discontinued operations	(51.0)	(56.8)	(340.5)
Net cash provided (used) by investing activities	(5,796.5)	(8,874.0)	9,274.6
Cash flows from financing activities:			
Borrowings of debt	2,570.7	13,205.8	4,445.8
Operating-related vendor financing additions	1,781.6	2,754.5	2,159.0
Repayments and repurchases of debt and finance lease obligations:			
Debt (excluding vendor financing)	(1,721.0)	(8,857.1)	(6,292.2)
Principal payments on operating-related vendor financing	(1,408.0)	(2,381.7)	(1,821.9)
Principal payments on capital-related vendor financing	(964.4)	(2,088.8)	(2,085.9)
Principal payments on finance leases	(75.7)	(86.0)	(72.9)
Repurchases of Liberty Global ordinary shares	(1,580.4)	(1,072.3)	(3,219.4)
Net cash received related to derivative instruments	143.6	129.1	331.5
Distributions by subsidiaries to noncontrolling interest owners	(137.6)	(137.1)	(32.6)
Payment of financing costs and debt premiums	(23.3)	(290.0)	(206.8)
Repurchases by Telenet of its outstanding shares	(14.3)	(38.1)	(114.1)
Other financing activities, net	(83.8)	(33.8)	1.0
Net cash provided (used) by financing activities of continuing operations	(1,512.6)	1,104.5	(6,908.5)
Net cash used by financing activities of discontinued operations	(33.3)	(20.9)	(268.1)
Net cash provided (used) by financing activities	\$ (1,545.9)	\$ 1,083.6	\$ (7,176.6)

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF CASH FLOWS — (Continued)

	Year ended December 31,		
	2021	2020	2019
	in millions		
Effect of exchange rate changes on cash and cash equivalents and restricted cash:			
Continuing operations	\$ (6.6)	\$ 141.0	\$ 0.4
Discontinued operations	—	—	(1.2)
Total	(6.6)	141.0	(0.8)
Net increase (decrease) in cash and cash equivalents and restricted cash:			
Continuing operations	(3,900.7)	(3,554.9)	6,233.1
Discontinued operations	100.7	91.3	449.5
Total	<u>\$ (3,800.0)</u>	<u>\$ (3,463.6)</u>	<u>\$ 6,682.6</u>
Cash and cash equivalents and restricted cash:			
Beginning of year	\$ 4,717.3	\$ 8,180.9	\$ 1,498.3
Net increase (decrease)	(3,800.0)	(3,463.6)	6,682.6
End of year	<u>\$ 917.3</u>	<u>\$ 4,717.3</u>	<u>\$ 8,180.9</u>
Cash paid for interest:			
Continuing operations	\$ 830.3	\$ 1,126.0	\$ 1,421.1
Discontinued operations	1.7	1.7	363.1
Total	<u>\$ 832.0</u>	<u>\$ 1,127.7</u>	<u>\$ 1,784.2</u>
Net cash paid for taxes:			
Continuing operations	\$ 156.2	\$ 228.9	\$ 341.4
Discontinued operations	34.2	18.8	152.7
Total	<u>\$ 190.4</u>	<u>\$ 247.7</u>	<u>\$ 494.1</u>
Details of end of period cash and cash equivalents and restricted cash:			
Cash and cash equivalents	\$ 910.6	\$ 1,327.2	\$ 8,142.4
Restricted cash included in other current assets and other assets, net	6.7	6.8	38.5
Cash and cash equivalents and restricted cash included in assets held for sale	—	3,383.3	—
Total cash and cash equivalents and restricted cash	<u>\$ 917.3</u>	<u>\$ 4,717.3</u>	<u>\$ 8,180.9</u>

The accompanying notes are an integral part of these consolidated financial statements.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements
December 31, 2021, 2020 and 2019

(1) Basis of Presentation

Liberty Global plc (**Liberty Global**) is a public limited company organized under the laws of England and Wales. In these notes, the terms “we,” “our,” “our company” and “us” may refer, as the context requires, to Liberty Global or collectively to Liberty Global and its subsidiaries. We are an international provider of broadband internet, video, fixed-line telephony and mobile communications services to residential customers and businesses in Europe.

Our continuing operations comprise businesses that provide residential and business-to-business (**B2B**) communications services in (i) Switzerland and Slovakia through certain wholly-owned subsidiaries that we collectively refer to as “**UPC Holding**”, (ii) Belgium through Telenet Group Holding N.V. (**Telenet**), a 60.8%-owned subsidiary, and (iii) Ireland through another wholly-owned subsidiary (**VM Ireland**). In addition, we own 50% noncontrolling interests in (a) a 50:50 joint venture (the **VodafoneZiggo JV**) with Vodafone Group plc (**Vodafone**), which provides residential and B2B communication services in the Netherlands, and (b) a 50:50 joint venture (the **VMO2 JV**) with Telefónica SA (**Telefónica**), which provides residential and B2B communication services in the United Kingdom (**U.K.**).

In addition, we currently provide residential and B2B communications services in Poland through UPC Holding. On September 22, 2021, we entered into an agreement to sell our operations in Poland. Accordingly, in these consolidated financial statements, our operations in Poland are reflected as discontinued operations for all periods presented. For additional information, see note 6.

Through May 31, 2021, our consolidated operations also included residential and B2B communications services provided to customers in the U.K. through Virgin Media Inc. (**Virgin Media**). On June 1, 2021, we contributed the U.K. JV Entities (as defined in note 6) to the VMO2 JV and began accounting for our 50% interest in the VMO2 JV as an equity method investment. For additional information, see note 6.

Through July 31, 2019, we provided residential and B2B communication services in (i) Germany through Unitymedia GmbH (**Unitymedia**) and (ii) Hungary, the Czech Republic and Romania through UPC Holding. In addition, through May 2, 2019, we provided direct-to-home satellite (**DTH**) services to residential customers in Hungary, the Czech Republic, Romania and Slovakia through a Luxembourg-based subsidiary of UPC Holding that we refer to as “**UPC DTH**”. In these consolidated financial statements, our operations in Germany, Romania, Hungary and the Czech Republic and the operations of UPC DTH are presented as discontinued operations for all applicable periods. For information regarding the disposition of these entities, see note 6.

These consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States (**GAAP**). Unless otherwise indicated, the amounts presented in these notes relate only to our continuing operations, and ownership percentages and convenience translations into United States (**U.S.**) dollars are calculated as of December 31, 2021.

(2) Accounting Changes and Recent Accounting Pronouncements

Accounting Changes

ASU 2019-12

In December 2019, the Financial Accounting Standards Board (the **FASB**) issued Accounting Standards Update (**ASU**) No. 2019-12, *Simplifying the Accounting for Income Taxes (ASU 2019-12)*, which is intended to improve consistency and simplify several areas of existing guidance. ASU 2019-12 removes certain exceptions to the general principles related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and the recognition of deferred tax liabilities for outside basis differences. The new guidance also clarifies the accounting for transactions that result in a step-up in the tax basis of goodwill. We adopted ASU 2019-12 on January 1, 2021, and such adoption did not have a significant impact on our consolidated financial statements.

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ASU 2019-02

In March 2019, the FASB issued ASU No. 2019-02, *Improvements to Accounting for Costs of Films and License Agreements for Program Materials (ASU 2019-02)*, which aligns the accounting for production costs of an episodic television series with the accounting for production costs of films. ASU 2019-02 removes the existing constraint that restricts capitalization of production costs to contracted revenue for episodic television series. The amended guidance also permits entities to test a film or license agreement for impairment at the film group level, addresses cash flow classification and provides new disclosure requirements. We adopted ASU 2019-02 on January 1, 2020 on a prospective basis. The adoption of ASU 2019-02 did not have a significant impact on our consolidated financial statements.

ASU 2018-15

In August 2018, the FASB issued ASU No. 2018-15, *Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that is a Service Contract (ASU 2018-15)*, which requires entities to defer implementation costs incurred that are related to the application development stage in a cloud computing arrangement that is a service contract. ASU 2018-15 requires deferred implementation costs to be amortized over the term of the cloud computing arrangement and presented in the same expense line item as the cloud computing arrangement. All other implementation costs are generally expensed as incurred. We adopted ASU 2018-15 on January 1, 2020 on a prospective basis. As a result of the adoption of ASU 2018-15, (i) certain implementation costs that were previously expensed as incurred are now deferred as prepaid expenses and amortized over the term of the cloud computing arrangement and (ii) certain costs associated with developing interfaces between a cloud computing arrangement and internal-use software that were previously capitalized as property and equipment are now deferred as prepaid expenses and amortized over the term of the cloud computing arrangement. The adoption of ASU 2018-15 did not have a significant impact on our consolidated financial statements.

ASU 2016-13

In June 2016, the FASB issued ASU No. 2016-13, *Measurement of Credit Losses on Financial Statements (ASU 2016-13)*, which changes the recognition model for credit losses related to assets held at amortized cost. ASU 2016-13 eliminates the threshold that a loss must be considered probable to recognize a credit loss and instead requires an entity to reflect its current estimate of lifetime expected credit losses. We adopted ASU 2016-13 on January 1, 2020 on a modified retrospective basis by recording a cumulative effect adjustment of \$30.3 million to our accumulated earnings related to increases to our allowances for certain trade and notes receivable.

Recent Accounting Pronouncements

ASU 2021-08

In October 2021, the FASB issued ASU No. 2021-08, *Accounting for Contract Assets and Contract Liabilities from Contracts with Customers (ASU 2021-08)*, which requires contract assets and contract liabilities acquired in a business combination to be recognized and measured in accordance with Topic 606, *Revenue from Contracts with Customers*, as if the acquirer had originated the contracts. ASU 2021-08 is effective for annual reporting periods beginning after December 15, 2022, including interim periods within those fiscal years, with early adoption permitted. The main impact of the adoption of ASU 2021-08 will be the recognition of contract assets and contract liabilities in future business combinations at amounts generally consistent with the carrying value of such assets and liabilities of the acquiree immediately before the acquisition date.

ASU 2020-04

In April 2020, the FASB issued ASU No. 2020-04, *Facilitation of the Effects of Reference Rate Reform on Financial Reporting (ASU 2020-04)*, which provides optional expedients and exceptions for contract modifications, subject to meeting certain criteria, that reference the London Interbank Offered Rate (**LIBOR**) or another reference rate expected to be discontinued. In accordance with the optional expedients in ASU 2020-04, we expect to modify certain of our debt agreements during 2022 to replace LIBOR with another reference rate and apply the practical expedient to account for the modification as a continuation of the existing contract. We currently do not believe the use of optional expedients in ASU 2020-04 will have a significant impact on our consolidated financial statements. For additional information regarding our debt, see note 11.

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(3) Summary of Significant Accounting Policies

Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. Estimates and assumptions are used in accounting for, among other things, the valuation of acquisition-related assets and liabilities, allowances for doubtful accounts, certain components of revenue, programming and copyright costs, deferred income taxes and related valuation allowances, loss contingencies, fair value measurements, impairment assessments, capitalization of internal costs associated with construction and installation activities, useful lives of long-lived assets, share-based compensation and actuarial liabilities associated with certain benefit plans. Actual results could differ from those estimates.

Principles of Consolidation

The accompanying consolidated financial statements include our accounts and the accounts of all voting interest entities where we exercise a controlling financial interest through the ownership of a direct or indirect controlling voting interest and variable interest entities for which our company is the primary beneficiary. All significant intercompany accounts and transactions have been eliminated in consolidation.

Cash and Cash Equivalents and Restricted Cash

Cash equivalents consist of money market funds and other investments that are readily convertible into cash and have maturities of three months or less at the time of acquisition. We record money market funds at the net asset value as there are no restrictions on our ability, contractual or otherwise, to redeem our investments at the stated net asset value.

Restricted cash consists of cash held in restricted accounts, including cash held as collateral for debt and other compensating balances. Restricted cash amounts that are required to be used to purchase long-term assets or repay long-term debt are classified as long-term assets. All other cash that is restricted to a specific use is classified as current or long-term based on the expected timing of the disbursement.

Our significant non-cash investing and financing activities are disclosed in our consolidated statements of equity and in notes 8, 10, 11 and 12.

Cash Flow Statement

For purposes of our consolidated statements of cash flows, operating-related expenses financed by an intermediary are treated as constructive operating cash outflows and constructive financing cash inflows when the intermediary settles the liability with the vendor as there is no actual cash outflow until we pay the financing intermediary. When we pay the financing intermediary, we record financing cash outflows in our consolidated statements of cash flows. The capital expenditures we report in our consolidated statements of cash flows do not include amounts that are financed under capital-related vendor financing or finance lease arrangements. Instead, these amounts are reflected as non-cash additions to our property and equipment when the underlying assets are delivered, and as repayments of debt when the principal is repaid.

Trade Receivables

Our trade receivables are reported net of an allowance for doubtful accounts. Such allowance aggregated \$42.0 million and \$48.3 million at December 31, 2021 and 2020, respectively. The allowance for doubtful accounts is based upon our current estimate of lifetime expected credit losses related to uncollectible accounts receivable. We use a number of factors in determining the allowance, including, among other things, collection trends, prevailing and anticipated economic conditions and specific customer credit risk. The allowance is maintained until either payment is received or the likelihood of collection is considered to be remote.

Concentration of credit risk with respect to trade receivables is limited due to the large number of residential and business customers. We also manage this risk by disconnecting services to customers whose accounts are delinquent.

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Investments

We make elections, on an investment-by-investment basis, as to whether we measure our investments at fair value. Such elections are generally irrevocable. With the exception of those investments over which we exercise significant influence, we generally elect the fair value method. For those investments over which we exercise significant influence, we generally elect the equity method. We determine the appropriate classification of our investments in debt securities at the time of purchase based on the underlying nature and characteristics of each security. All of our debt securities are classified as available for sale and are reported at fair value.

Under the fair value method, investments are recorded at fair value and any changes in fair value are reported in realized and unrealized gains or losses due to changes in fair values of certain investments and debt, net, in our consolidated statements of operations. All costs directly associated with the acquisition of an investment to be accounted for using the fair value method are expensed as incurred. In addition, any interest received on our debt securities is reported as interest income in our consolidated statements of operations. Under the equity method, investments are recorded at cost and are subsequently increased or reduced to reflect our share of net earnings or losses of the investee. All costs directly associated with the acquisition of an investment to be accounted for using the equity method are included in the carrying amount of the investment. For additional information regarding our fair value and equity method investments, see notes 7 and 9.

Under the equity method, investments, originally recorded at cost, are adjusted to recognize our share of net earnings or losses of the affiliates as they occur rather than as dividends or other distributions are received, with our recognition of losses generally limited to the extent of our investment in, and advances and commitments to, the investee. The portion of the difference between our investment and our share of the net assets of the investee that represents goodwill is not amortized, but continues to be considered for impairment. Profits on transactions with equity affiliates for which assets remain on our or our investee's balance sheet are eliminated to the extent of our ownership in the investee.

Dividends from publicly-traded investees that are not accounted for under the equity method are recognized when declared as dividend income in our consolidated statements of operations. Dividends from our equity method investees and all of our privately-held investees are reflected as reductions in the carrying values of the applicable investments. Dividends that are deemed to be (i) returns on our investments are included in cash flows from operating activities in our consolidated statements of cash flows and (ii) returns of our investments are included in cash flows from investing activities in our consolidated statements of cash flows.

We continually review all of our equity method investments to determine whether a decline in fair value below the cost basis is deemed other-than-temporary. The primary factors we consider in our determination are the extent and length of time that the fair value of the investment is below our company's carrying value and the financial condition, operating performance and near-term prospects of the investee, changes in the stock price or valuation subsequent to the balance sheet date, and the impacts of exchange rates, if applicable. If the decline in fair value of an equity method investment is deemed to be other-than-temporary, the cost basis of the security is written down to fair value.

Realized gains and losses are determined on an average cost basis. Securities transactions are recorded on the trade date.

Financial Instruments

Due to the short maturities of cash and cash equivalents, restricted cash, short-term liquid investments, trade and other receivables, other current assets, accounts payable and other accrued and current liabilities, their respective carrying values approximate their respective fair values. For information concerning the fair values of certain of our investments, derivatives and debt, see notes 7, 8 and 11, respectively. For information regarding how we arrive at certain of our fair value measurements, see note 9.

Derivative Instruments

All derivative instruments, whether designated as hedging relationships or not, are recorded on the balance sheet at fair value. We generally do not apply hedge accounting to our derivative instruments, therefore changes in the fair value of derivative instruments are recognized in earnings or loss.

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The net cash received or paid related to our derivative instruments is classified as an operating, investing or financing activity in our consolidated statements of cash flows based on the objective of the derivative instrument and the classification of the applicable underlying cash flows. For additional information regarding our derivative instruments, see note 8.

Property and Equipment

Property and equipment are stated at cost less accumulated depreciation. We capitalize costs associated with the construction of new fixed and mobile transmission and distribution facilities and the installation of new fixed-line services. Capitalized construction and installation costs include materials, labor and other directly attributable costs. Installation activities that are capitalized include (i) the initial connection (or drop) from our fixed-line system to a customer location, (ii) the replacement of a drop and (iii) the installation of equipment for additional services, such as broadband internet or fixed-line services. The costs of other customer-facing activities, such as reconnecting and disconnecting customer locations and repairing or maintaining drops, are expensed as incurred. Interest capitalized with respect to construction activities was not material during any of the periods presented.

Capitalized internal-use software is included as a component of property and equipment. We capitalize internal and external costs directly associated with the development of internal-use software. We also capitalize costs associated with the purchase of software licenses. Maintenance and training costs, as well as costs incurred during the preliminary stage of an internal-use software development project, are expensed as incurred.

Depreciation is computed using the straight-line method over the estimated useful life of the underlying asset. Equipment under finance leases is amortized on a straight-line basis over the shorter of the lease term or estimated useful life of the asset. Useful lives used to depreciate our property and equipment are assessed periodically and are adjusted when warranted. The useful lives of fixed and mobile distribution systems that are undergoing a rebuild are adjusted such that property and equipment to be retired will be fully depreciated by the time the rebuild is completed. For additional information regarding the useful lives of our property and equipment, see note 10.

Additions, replacements and improvements that extend the asset life are capitalized. Repairs and maintenance are charged to operations.

We recognize a liability for asset retirement obligations in the period in which it is incurred if sufficient information is available to make a reasonable estimate of fair values. Asset retirement obligations may arise from the loss of rights of way that we obtain from local municipalities or other relevant authorities, as well as our obligations under certain lease arrangements to restore the property to its original condition at the end of the lease term. Given the nature of our operations, most of our rights of way and certain leased premises are considered integral to our business. Accordingly, for most of our rights of way and certain lease agreements, the possibility is remote that we will incur significant removal costs in the foreseeable future and, as such, we do not have sufficient information to make a reasonable estimate of fair value for these asset retirement obligations.

As of December 31, 2021 and 2020, the recorded value of our asset retirement obligations was \$77.1 million and \$80.2 million, respectively.

Intangible Assets

Our primary intangible assets relate to goodwill and customer relationships. Goodwill represents the excess purchase price over the fair value of the identifiable net assets acquired in a business combination. Customer relationships are initially recorded at their fair value in connection with business combinations.

Goodwill and other intangible assets with indefinite useful lives are not amortized, but instead are tested for impairment at least annually. Intangible assets with finite lives are amortized on a straight-line basis over their respective estimated useful lives to their estimated residual values.

For additional information regarding the useful lives of our intangible assets, see note 10.

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Impairment of Property and Equipment and Intangible Assets

When circumstances warrant, we review the carrying amounts of our property and equipment and our intangible assets (other than goodwill and other indefinite-lived intangible assets) to determine whether such carrying amounts continue to be recoverable. Such changes in circumstance may include (i) an expectation of a sale or disposal of a long-lived asset or asset group, (ii) adverse changes in market or competitive conditions, (iii) an adverse change in legal factors or business climate in the markets in which we operate and (iv) operating or cash flow losses. For purposes of impairment testing, long-lived assets are grouped at the lowest level for which cash flows are largely independent of other assets and liabilities, generally at or below the reporting unit level (see below). If the carrying amount of the asset or asset group is greater than the expected undiscounted cash flows to be generated by such asset or asset group, an impairment adjustment is recognized. Such adjustment is measured by the amount that the carrying value of such asset or asset group exceeds its fair value. We generally measure fair value by considering (a) sale prices for similar assets, (b) discounted estimated future cash flows using an appropriate discount rate and/or (c) estimated replacement cost. Assets to be disposed of are recorded at the lower of their carrying amount or fair value less costs to sell.

We evaluate goodwill and other indefinite-lived intangible assets for impairment at least annually on October 1 and whenever facts and circumstances indicate that their carrying amounts may not be recoverable. For impairment evaluations with respect to both goodwill and other indefinite-lived intangibles, we first make a qualitative assessment to determine if the goodwill or other indefinite-lived intangible may be impaired. In the case of goodwill, if it is more-likely-than-not that a reporting unit's fair value is less than its carrying value, we then compare the fair value of the reporting unit to its respective carrying amount. Any excess of the carrying amount over the fair value would be charged to operations as an impairment loss. A reporting unit is an operating segment or one level below an operating segment (referred to as a "component"). With respect to other indefinite-lived intangible assets, if it is more-likely-than-not that the fair value of an indefinite-lived intangible asset is less than its carrying value, we then estimate its fair value and any excess of the carrying value over the fair value is also charged to operations as an impairment loss.

Leases

For leases with a term greater than 12 months, we recognize on the lease commencement date (i) right-of-use (ROU) assets representing our right to use an underlying asset and (ii) lease liabilities representing our obligation to make lease payments over the lease term. Lease and non-lease components in a contract are generally accounted for separately.

We initially measure lease liabilities at the present value of the remaining lease payments over the lease term. Options to extend or terminate the lease are included only when it is reasonably certain that we will exercise that option. As most of our leases do not provide enough information to determine an implicit interest rate, we generally use a portfolio level incremental borrowing rate in our present value calculation. We initially measure ROU assets at the value of the lease liability, plus any initial direct costs and prepaid lease payments, less any lease incentives received.

With respect to our finance leases, (i) ROU assets are generally depreciated on a straight-line basis over the shorter of the lease term or the useful life of the asset and (ii) interest expense on the lease liability is recorded using the effective interest method. Operating lease expense is recognized on a straight-line basis over the lease term. For leases with a term of 12 months or less (short-term leases), we do not recognize ROU assets or lease liabilities. Short-term lease expense is recognized on a straight-line basis over the lease term.

Income Taxes

Income taxes are accounted for under the asset and liability method. We recognize deferred tax assets and liabilities for the future tax consequences attributable to differences between the financial statement carrying amounts and income tax basis of assets and liabilities and the expected benefits of utilizing net operating loss and tax credit carryforwards, using enacted tax rates in effect for each taxing jurisdiction in which we operate for the year in which those temporary differences are expected to be recovered or settled. We recognize the financial statement effects of a tax position when it is more-likely-than-not, based on technical merits, that the position will be sustained upon examination. Net deferred tax assets are then reduced by a valuation allowance if we believe it is more-likely-than-not such net deferred tax assets will not be realized. Certain of our valuation allowances and tax uncertainties are associated with entities that we acquired in business combinations. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in earnings or loss in the period that includes the enactment date.

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Deferred tax liabilities related to investments in foreign subsidiaries and foreign corporate joint ventures that are essentially permanent in duration are not recognized until it becomes apparent that such amounts will reverse in the foreseeable future. In order to be considered essentially permanent in duration, sufficient evidence must indicate that the foreign subsidiary has invested or will invest its undistributed earnings indefinitely, or that earnings will be remitted in a tax-free manner. The 2017 Tax Cuts and Jobs Act created a requirement that certain income earned by foreign subsidiaries, known as global intangible low-taxed income (**GILTI**), must be included in the gross income of their U.S. shareholder. We have elected to treat the tax effect of GILTI as a current-period expense when incurred. Interest and penalties related to income tax liabilities are included in income tax benefit or expense in our consolidated statements of operations.

For additional information regarding our income taxes, see note 13.

Foreign Currency Translation and Transactions

The reporting currency of our company is the U.S. dollar. The functional currency of our foreign operations generally is the applicable local currency for each foreign subsidiary and equity method investee. Assets and liabilities of foreign subsidiaries (including intercompany balances for which settlement is not anticipated in the foreseeable future) are translated at the spot rate in effect at the applicable reporting date. With the exception of certain material transactions, the amounts reported in our consolidated statements of operations are translated at the average exchange rates in effect during the applicable period. The resulting unrealized cumulative translation adjustment, net of applicable income taxes, is recorded as a component of accumulated other comprehensive earnings or loss in our consolidated statements of equity. With the exception of certain material transactions, the cash flows from our operations in foreign countries are translated at the average rate for the applicable period in our consolidated statements of cash flows. The impacts of material transactions generally are recorded at the applicable spot rates in our consolidated statements of operations and cash flows. The effect of exchange rates on cash balances held in foreign currencies are separately reported in our consolidated statements of cash flows.

Transactions denominated in currencies other than our or our subsidiaries' functional currencies are recorded based on exchange rates at the time such transactions arise. Changes in exchange rates with respect to amounts recorded on our consolidated balance sheets related to these non-functional currency transactions result in transaction gains and losses that are reflected in our consolidated statements of operations as unrealized (based on the applicable period end exchange rates) or realized upon settlement of the transactions.

Revenue Recognition

Service Revenue — Fixed Networks. We recognize revenue from the provision of broadband internet, video and fixed-line telephony services over our network to customers in the period the related services are provided, with the exception of revenue recognized pursuant to certain contracts that contain promotional discounts, as described below. Installation fees related to services provided over our network are generally deferred and recognized as revenue over the contractual period, or longer if the upfront fee results in a material renewal right.

Sale of Multiple Products and Services. We sell broadband internet, video, fixed-line telephony and, in most of our markets, mobile services to our customers in bundled packages at a rate lower than if the customer purchased each product on a standalone basis. Revenue from bundled packages generally is allocated proportionally to the individual products or services based on the relative standalone selling price for each respective product or service.

Mobile Revenue — General. Consideration from mobile contracts is allocated to the airtime service component and the handset component based on the relative standalone selling prices of each component. In markets where we offer handsets and airtime services in separate contracts entered into at the same time, we account for these contracts as a single contract.

Mobile Revenue — Airtime Services. We recognize revenue from mobile services in the period in which the related services are provided. Revenue from prepaid customers is deferred prior to the commencement of services and recognized as the services are rendered or usage rights expire.

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Mobile Revenue — Handset Revenue. Revenue from the sale of handsets is recognized at the point in which the goods have been transferred to the customer. Some of our mobile handset contracts that permit the customer to take control of the handset upfront and pay for the handset in installments over a contractual period may contain a significant financing component. For contracts with terms of one year or more, we recognize any significant financing component as revenue over the contractual period using the effective interest method. We do not record the effect of a significant financing component if the contractual period is less than one year.

B2B Revenue. We defer upfront installation and certain nonrecurring fees received on B2B contracts where we maintain ownership of the installed equipment. The deferred fees are amortized into revenue on a straight-line basis, generally over the longer of the term of the arrangement or the expected period of performance. From time to time, we also enter into agreements with certain B2B customers pursuant to which they are provided the right to use certain elements of our network. If these agreements are determined to contain a lease that meets the criteria to be considered a sales-type lease, we recognize revenue from the lease component when control of the network element is transferred to the customer.

Contract Costs. Incremental costs to obtain a contract with a customer, such as incremental sales commissions, are generally recognized as assets and amortized to SG&A expenses over the applicable period benefited, which generally is the contract life. If, however, the amortization period is less than one year, we expense such costs in the period incurred. Contract fulfillment costs, such as costs for installation activities for B2B customers, are recognized as assets and amortized to other operating costs over the applicable period benefited, which is generally the substantive contract term for the related service contract.

Promotional Discounts. For subscriber promotions, such as discounted or free services during an introductory period, revenue is recognized uniformly over the contractual period if the contract has substantive termination penalties. If a contract does not have substantive termination penalties, revenue is recognized only to the extent of the discounted monthly fees charged to the subscriber, if any.

Subscriber Advance Payments. Payments received in advance for the services we provide are deferred and recognized as revenue when the associated services are provided.

Sales, Use and Other Value-Added Taxes. Revenue is recorded net of applicable sales, use and other value-added taxes (VAT).

For additional information regarding our revenue recognition and related costs, see note 4. For a disaggregation of our revenue by major category and by reportable and geographic segment, see note 19.

Programming Costs

Programming costs include (i) agreements to distribute channels to our customers, (ii) exhibition rights of programming content and (iii) sports rights.

Channel Distribution Agreements. Our channel distribution agreements are generally multi-year contracts for which we are charged either (i) variable rates based upon the number of subscribers or (ii) on a flat fee basis. Certain of our variable rate contracts require minimum guarantees. Programming costs under such arrangements are recorded in operating costs and expenses in our consolidated statement of operations when the programming is available for viewing.

Exhibition Rights. Our agreements for exhibition rights are generally multi-year license agreements for which we are typically charged either (i) a percentage of the revenue earned per program or (ii) a flat fee per program. The current and long-term portions of our exhibition rights acquired under licenses are recorded as other current assets and other assets, net, respectively, on our consolidated balance sheet when the license period begins and the program is available for its first showing. Capitalized exhibition rights are amortized based on the projected future showings of the content using a straight-line or accelerated method of amortization, as appropriate. Exhibition rights are regularly reviewed for impairment and held at the lower of unamortized cost or estimated net realizable value.

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Sports Rights. Our sports rights agreements are generally multi-year contracts for which we are typically charged a flat fee per season. We typically pay for sports rights in advance of the respective season. The current and long-term portions of any payments made in advance of the respective season are recorded as other current assets and other assets, net, respectively, on our consolidated balance sheet and are amortized on a straight-line basis over the respective sporting season. Sports rights are regularly reviewed for impairment and held at the lower of unamortized cost or estimated net realizable value.

For additional information regarding our programming costs, see note 18.

Share-based Compensation

We recognize all share-based payments to employees, including grants of employee share-based incentive awards, based on their grant-date fair values and our estimates of forfeitures. We recognize share-based compensation expense as a charge to operations over the vesting period based on the grant-date fair value of outstanding awards, which may differ from the fair value of such awards on any given date. Our share of payroll taxes incurred in connection with the vesting or exercise of our share-based incentive awards is recorded as a component of share-based compensation expense in our consolidated statements of operations.

We use the straight-line method to recognize share-based compensation expense for our outstanding share awards that do not contain a performance condition and the accelerated expense attribution method for our outstanding share awards that contain a performance condition and vest on a graded basis.

The grant date fair values for options, share appreciation rights (**SARs**) and performance-based share appreciation rights (**PSARs**) are estimated using the Black-Scholes option pricing model, and the grant date fair values for restricted share units (**RSUs**), restricted share awards (**RSAs**) and performance-based restricted share units (**PSUs**) are based upon the closing share price of Liberty Global ordinary shares on the date of grant. We consider historical exercise trends in our calculation of the expected life of options and SARs granted by Liberty Global to employees. The expected volatility for options and SARs related to our ordinary shares is generally based on a combination of (i) historical volatilities for a period equal to the expected average life of the awards and (ii) volatilities implied from publicly-traded options for our shares.

We generally issue new Liberty Global ordinary shares when Liberty Global options or SARs are exercised, when RSUs and PSUs vest and when RSAs are granted. Our company settles SARs and PSARs on a net basis when exercised by the award holder, whereby the number of shares issued represents the excess value of the award based on the market price of the respective Liberty Global shares at the time of exercise relative to the award's exercise price. In addition, the number of shares issued is further reduced by the amount of the employee's required income tax withholding.

Although we repurchase Liberty Global ordinary shares from time to time, the parameters of our share purchase and redemption activities are not established with reference to the dilutive impact of our share-based compensation plans.

For additional information regarding our share-based compensation, see note 15.

Litigation Costs

Legal fees and related litigation costs are expensed as incurred.

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Earnings or Loss per Share

Basic earnings or loss per share (**EPS**) is computed by dividing net earnings or loss by the weighted average number of shares outstanding for the period. Diluted EPS presents the dilutive effect, if any, on a per share basis of potential shares (e.g., options, SARs, RSUs, RSAs, PSARs and PSUs) as if they had been exercised, vested or converted at the beginning of the periods presented.

The details of our net earnings (loss) from continuing operations attributable to Liberty Global shareholders are set forth below:

	Year ended December 31,		
	2021	2020	2019
	in millions, except share amounts		
Earnings (loss) from continuing operations	\$ 13,527.5	\$ (1,525.1)	\$ (1,475.9)
Net earnings from continuing operations attributable to noncontrolling interests	(183.3)	(161.3)	(116.8)
Net earnings (loss) from continuing operations attributable to Liberty Global shareholders	<u>\$ 13,344.2</u>	<u>\$ (1,686.4)</u>	<u>\$ (1,592.7)</u>
Weighted average ordinary shares outstanding (basic EPS computation)	555,695,224	602,083,910	705,794,546
Incremental shares attributable to the assumed exercise of outstanding options and SARs and the release of RSUs, RSAs and PSUs upon vesting (treasury stock method)	13,418,999	—	—
Weighted average ordinary shares outstanding (diluted EPS computation)	<u>569,114,223</u>	<u>602,083,910</u>	<u>705,794,546</u>

The calculation of diluted earnings per share during 2021 excludes a total of 47.9 million options, SARs and RSUs because their effect would have been anti-dilutive.

We reported losses from continuing operations attributable to Liberty Global shareholders during 2020 and 2019. Therefore, the potentially dilutive effect at December 31, 2020 and 2019 of the following items was not included in the computation of diluted loss from continuing operations attributable to Liberty Global shareholders per share because their inclusion would have been anti-dilutive to the computation or, in the case of certain PSARs and PSUs, because such awards had not yet met the applicable performance criteria: (i) the aggregate number of shares issuable pursuant to outstanding options, SARs, RSUs and RSAs of 76.1 million and 62.5 million, respectively, and (ii) the aggregate number of shares issuable pursuant to PSARs and PSUs of 18.4 million and 23.9 million, respectively.

(4) Revenue Recognition and Related Costs

Contract Balances

If we transfer goods or services to a customer but do not have an unconditional right to payment, we record a contract asset. Contract assets typically arise from the uniform recognition of introductory promotional discounts over the contract period and accrued revenue for handset sales. Our contract assets were \$29.7 million and \$43.3 million as of December 31, 2021 and 2020, respectively. The current and long-term portions of our contract asset balances are included within other current assets and other assets, net, respectively, on our consolidated balance sheets.

We record deferred revenue when we receive payment prior to transferring goods or services to a customer. We primarily defer revenue for (i) installation and other upfront services and (ii) other services that are invoiced prior to when services are provided. Our deferred revenue balances were \$286.5 million and \$437.3 million as of December 31, 2021 and 2020, respectively. The decrease in deferred revenue during 2021 is primarily due to the net effect of (a) the recognition of \$357.1 million of revenue that was included in our deferred revenue balance at December 31, 2020 and (b) the impact of additions during the period. The long-term portions of our deferred revenue balances are included within other long-term liabilities on our consolidated balance sheets.

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Contract Costs

Our aggregate assets associated with incremental costs to obtain and fulfill our contracts were \$63.4 million and \$34.8 million at December 31, 2021 and 2020, respectively. The current and long-term portions of our assets related to contract costs are included within other current assets and other assets, net, respectively, on our consolidated balance sheets. During 2021, 2020 and 2019, we amortized \$81.3 million, \$113.2 million and \$80.2 million, respectively, to operating costs and expenses associated with these assets.

Unsatisfied Performance Obligations

A large portion of our revenue is derived from customers who are not subject to contracts. Revenue from customers who are subject to contracts is generally recognized over the term of such contracts, which is typically 12 months for our residential service contracts, one to three years for our mobile service contracts and one to five years for our B2B service contracts.

(5) Acquisitions

2020 Acquisition

Sunrise Acquisition. On November 11, 2020, we completed the acquisition of Sunrise Communications Group AG (**Sunrise**) (the **Sunrise Acquisition**). The Sunrise Acquisition was effected through an all cash public tender offer of the outstanding shares of Sunrise (the **Sunrise Shares**) for CHF 110 (\$120 at the transaction date) per share, for a total purchase price of CHF 5.0 billion (\$5.4 billion at the transaction date). In April 2021, we completed a statutory “squeeze-out” procedure, under applicable Swiss law, to acquire the remaining Sunrise Shares that were not acquired pursuant to the tender offer and, accordingly, now hold 100% of the share capital of Sunrise.

We have accounted for the Sunrise Acquisition using the acquisition method of accounting, whereby the total purchase price was allocated to the acquired identifiable net assets of Sunrise based on assessments of their respective fair values, and the excess of the purchase price over the fair values of these identifiable net assets was allocated to goodwill. A summary of the purchase price and the opening balance sheet of Sunrise at the November 11, 2020 acquisition date is presented in the following table. The opening balance sheet presented below reflects our final purchase price allocation (in millions):

Cash and cash equivalents	\$ 108.5
Trade receivables, net	484.2
Other current assets	148.3
Property and equipment, net	1,541.4
Goodwill (a)	3,436.0
Intangible assets subject to amortization, net	2,485.8
Operating lease ROU assets	1,047.1
Other assets, net	232.3
Current portion of debt and finance lease obligations	(133.2)
Current operating lease liabilities	(136.5)
Other accrued and current liabilities	(531.5)
Long-term debt and finance lease obligations	(1,762.5)
Long-term operating lease liabilities	(877.6)
Other long-term liabilities	(614.5)
Total purchase price (b)	\$ 5,427.8

- (a) The goodwill recognized in connection with the Sunrise Acquisition is primarily attributable to (i) the opportunity to leverage Sunrise’s existing mobile network to gain immediate access to potential customers and (ii) estimated synergy benefits through the integration of Sunrise with our existing operations in Switzerland.

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- (b) Excludes direct acquisition costs of \$27.8 million incurred during 2020, which are included in impairment, restructuring and other operating items, net, in our consolidated statement of operations.

2019 Acquisition

De Vijver Media. Prior to June 3, 2019, Telenet held a 50% equity method investment in De Vijver Media NV (**De Vijver Media**), which provides content production, broadcasting and advertising services in Belgium. On June 3, 2019, Telenet acquired the remaining 50% ownership interest in De Vijver Media (the **De Vijver Media Acquisition**) for cash consideration of €52.5 million (\$58.9 million at the transaction date) after post-closing adjustments. Immediately following this transaction, Telenet repaid in full De Vijver Media's €62.0 million (\$69.5 million at the transaction date) of outstanding third-party debt. In connection with the De Vijver Media Acquisition, we recognized a \$25.7 million gain during the second quarter of 2019, representing the difference between the fair value of \$57.9 million and carrying amount of our then-existing 50% ownership interest in De Vijver Media. This gain is included in other income, net, in our consolidated statement of operations.

Pro Forma Information

The following unaudited pro forma consolidated operating results give effect to the Sunrise Acquisition as if it had been completed as of January 1, 2019. No effect has been given to the De Vijver Media Acquisition since it would not have had a significant impact on our results of operations during 2019. These pro forma amounts are not necessarily indicative of the operating results that would have occurred if the Sunrise Acquisition had occurred on such date. The pro forma adjustments are based on certain assumptions that we believe are reasonable.

	Year ended December 31,	
	2020	2019
	(unaudited)	
Revenue (in millions)	\$ 13,206.8	\$ 12,978.4
Net loss from continuing operations attributable to Liberty Global shareholders (in millions)	\$ (1,902.3)	\$ (1,820.6)
Basic and diluted loss from continuing operations attributable to Liberty Global shareholders per share	\$ (3.16)	\$ (2.58)

Our consolidated statement of operations for 2020 includes revenue and net loss of \$314.0 million and \$15.4 million, respectively, attributable to Sunrise.

(6) Dispositions

Pending Disposition

On September 22, 2021, we entered into a sale and purchase agreement (the **Purchase Agreement**), pursuant to which we agreed to sell 100% of our operations in Poland (**UPC Poland**) to a third party for a total enterprise value of Polish zloty (**PLN**) 7,025.0 million (\$1,743.8 million), subject to customary debt and working capital adjustments at completion. Closing of the transaction, which we currently expect to occur in the first half of 2022, is subject to the satisfaction of certain conditions, including receipt of requisite regulatory approvals.

The proceeds from the sale are expected to be used (i) to repay a portion of the UPC Holding borrowing group's outstanding indebtedness and (ii) for general corporate purposes, which may include reinvestment into our business and support for our share repurchase program, which is further described in note 14.

We have agreed to provide certain transitional services for a period of up to five years, depending on the service. These services principally will comprise network and information technology-related functions. The annual charges will depend on the actual level of services required by the purchaser.

Effective with the signing of the Purchase Agreement, we began presenting UPC Poland as a discontinued operation and, accordingly, we no longer depreciate or amortize the associated long-lived assets. In our consolidated balance sheets and statements of operations and cash flows, UPC Poland is reflected as a discontinued operation for all periods presented. Our

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operations in Poland are held through UPC Holding. No debt, interest or derivative instruments of the UPC Holding borrowing group have been allocated to discontinued operations. Prior to being presented as a discontinued operation, the operations of UPC Poland were included in our former “*Central and Eastern Europe*” reportable segment.

2021 Dispositions

U.K. JV Transaction

On June 1, 2021, pursuant to a Contribution Agreement dated May 7, 2020 (the **Contribution Agreement**) with, among others, Telefónica, (i) we contributed Virgin Media’s U.K. operations and certain other Liberty Global subsidiaries (together, the **U.K. JV Entities**) to the VMO2 JV and (ii) Telefónica contributed its U.K. mobile business to the VMO2 JV, creating a nationwide integrated communications provider (herein referred to as the “**U.K. JV Transaction**”). We account for our 50% interest in the VMO2 JV as an equity method investment, as further described in note 7.

In connection with the U.K. JV Transaction, we received net cash of \$108.6 million, which includes the net impact of (i) equalization payments received from Telefónica, (ii) our share of the proceeds associated with related recapitalization financing transactions completed by the VMO2 JV and (iii) \$44.5 million of cash paid by Liberty Global to settle certain centrally-held vendor financing obligations associated with the VMO2 JV.

In connection with the U.K. JV Transaction, we recognized a pre-tax gain of \$10,873.8 million, net of the recognition of a cumulative foreign currency translation loss of \$1,198.6 million. The gain represents the net impact of the estimated fair value assigned to our 50% interest in the VMO2 JV of \$14,670.8 million plus the \$179.7 million of aggregate cash received pursuant to the aforementioned equalization payments and recapitalization transactions, less the sum of (i) the \$2,677.4 million carrying value of the U.K. JV Entities at May 31, 2021 (excluding the related foreign currency translation loss), (ii) the foreign currency translation loss of \$1,198.6 million and (iii) \$100.7 million related to (a) the settlement of certain receivables due from Telefónica associated with the aforementioned recapitalization transactions and (b) third-party fees and expenses. Our estimates continue to be preliminary and are subject to further adjustment based on our final assessment of the fair value of the net assets of the VMO2 JV. For information regarding our approach to the valuation of our interest in the VMO2 JV, see note 9.

A summary of the preliminary fair value of the assets and liabilities of the VMO2 JV at the June 1, 2021 transaction date is presented in the following table. The preliminary amounts below are subject to adjustment based on the final assessment of the fair values of the identifiable assets and liabilities (in millions):

Current assets	\$ 4,322.7
Property and equipment, net	12,523.2
Goodwill	29,195.1
Intangible assets subject to amortization, net	13,274.6
Other assets, net	3,997.2
Current portion of debt and finance lease obligations	(4,352.5)
Other accrued and current liabilities	(5,729.8)
Long-term debt and finance lease obligations	(21,879.2)
Other long-term liabilities	(2,009.7)
Total preliminary fair value of the net assets of the VMO2 JV	<u>\$ 29,341.6</u>

For periods prior to the June 1, 2021 completion of the U.K. JV Transaction, our consolidated statements of operations include aggregate earnings (loss) before income taxes attributable to the U.K. JV Entities of \$890.5 million, \$566.2 million and (\$450.4 million) during 2021, 2020 and 2019, respectively.

Effective with the signing of the Contribution Agreement, we began accounting for the U.K. JV Entities as held for sale. Accordingly, we ceased to depreciate or amortize the long-lived assets of the U.K. JV Entities. However, the U.K. JV Entities were not presented as discontinued operations as the U.K. JV Transaction did not represent a strategic shift as defined by GAAP.

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The June 1, 2021 carrying amounts of the major classes of assets and liabilities associated with the U.K. JV Entities, which were contributed to the VMO2 JV, are summarized below (in millions):

Assets:	
Current assets (a)	\$ 4,868.3
Property and equipment, net	9,465.1
Goodwill	8,214.7
Other assets, net	3,086.9
Total assets (b)	<u>\$ 25,635.0</u>
Liabilities:	
Current portion of debt and finance lease obligations	\$ 3,220.9
Other accrued and current liabilities	2,242.0
Long-term debt and finance lease obligations	16,905.1
Other long-term liabilities	1,788.2
Total liabilities (b)	<u>\$ 24,156.2</u>

(a) Amount includes \$3.4 billion of net proceeds from certain financing transactions completed in 2020 that were held in escrow pending the completion of the U.K. JV Transaction.

(b) The carrying amount of the net assets of \$1,478.8 million presented above is net of the cumulative foreign currency translation loss of \$1,198.6 million.

The carrying amounts of the major classes of assets and liabilities associated with the U.K. JV Entities that are classified as held for sale on our consolidated balance sheet as of December 31, 2020 are as follows (in millions):

Assets:	
Current assets	\$ 4,519.8
Property and equipment, net	8,614.0
Goodwill	7,918.5
Other assets, net	3,230.4
Total assets	<u>\$ 24,282.7</u>
Liabilities:	
Current portion of debt and finance lease obligations	\$ 2,699.5
Other accrued and current liabilities	2,207.3
Long-term debt and finance lease obligations	16,724.1
Other long-term liabilities	1,566.3
Total liabilities	<u>\$ 23,197.2</u>

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Atlas Edge JV Transactions

On September 1, 2021, we (i) contributed certain assets and liabilities to a newly-formed 50:50 joint venture (the **Atlas Edge JV**) that was established for the purpose of acquiring and commercializing European technical real estate for edge colocation and hosting services and (ii) sold certain other assets to the Atlas Edge JV. In addition, we sold certain other assets to the Atlas Edge JV during the fourth quarter of 2021. In connection with these transactions, which we collectively refer to as the “**Atlas Edge JV Transactions**”, we (a) received net cash of \$144.5 million and (b) recognized a gain of \$227.5 million (net of the recognition of a cumulative foreign currency translation loss of \$1.8 million), representing the difference between the estimated fair value and the carrying value of the net assets associated with these transactions. We account for our 50% interest in the Atlas Edge JV as an equity method investment.

2019 Dispositions

Vodafone Disposal Group

On July 31, 2019, we completed the sale of our operations in Germany, Romania, Hungary and the Czech Republic to Vodafone. The operations of Germany, Romania, Hungary and the Czech Republic are collectively referred to herein as the “**Vodafone Disposal Group**.”

After considering debt and working capital adjustments (including cash disposed) and €183.7 million (\$205.8 million at the transaction date) of cash paid by our company to settle centrally-held vendor financing obligations associated with the Vodafone Disposal Group, we received net cash proceeds of €10.0 billion (\$11.1 billion at the applicable rates). Pursuant to the agreement underlying the sale of the Vodafone Disposal Group, we transferred cash to fund certain third-party escrow accounts (the **Vodafone Escrow Accounts**) pending the fulfillment by our company of certain terms of the agreement. The current and long-term portions of the receivables associated with the Vodafone Escrow Accounts are included within other current assets and other assets, net, respectively, on our consolidated balance sheets. At December 31, 2020, the aggregate balance of the Vodafone Escrow Accounts was \$190.4 million. At December 31, 2021, the remaining balance was \$7.9 million, all of which is classified as current on our consolidated balance sheet.

In connection with the sale of the Vodafone Disposal Group, we recognized a gain of \$12.2 billion, which includes cumulative foreign currency translation gains of \$88.2 million and income taxes of \$35.4 million.

In connection with the sale of the Vodafone Disposal Group, we agreed to provide certain transitional services to Vodafone for a period of up to four years. These services principally comprise network and information technology-related functions. During 2021, 2020 and 2019, we recorded revenue of \$130.7 million, \$152.6 million and \$63.1 million, respectively, associated with these transitional services.

For information regarding certain tax indemnities we provided in connection with the sale of the Vodafone Disposal Group, see note 18.

UPC DTH

On May 2, 2019, we completed the sale of UPC DTH to M7 Group (**M7**). After considering debt and working capital adjustments (including cash disposed), we received net cash proceeds of €128.9 million (\$144.1 million at the applicable rates).

In connection with the sale of UPC DTH, we recognized a gain of \$106.0 million, which includes cumulative foreign currency translation losses of \$10.0 million. No income taxes were required to be provided on this gain.

In connection with the sale of UPC DTH, we agreed to provide certain transitional services to M7 for a period of up to two years. These services principally comprised network and information technology-related functions. During 2021, 2020 and 2019, we recorded revenue of \$0.7 million, \$1.9 million and \$1.4 million, respectively, associated with these transitional services.

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Presentation of Discontinued Operations

The operations of UPC Poland are presented as discontinued operations in our consolidated financial statements for all periods presented. In addition, the operations of the Vodafone Disposal Group and UPC DTH are presented as discontinued operations for 2019.

The carrying amounts of the major classes of assets and liabilities of UPC Poland as of December 31, 2021 and 2020 are summarized in the following table. Due to the fact that we expect to complete the sale of UPC Poland within 12 months, all of the associated assets and liabilities are classified as current on our consolidated balance sheets.

	December 31,	
	2021	2020
	in millions	
Assets:		
Current assets	\$ 23.4	\$ 26.8
Property and equipment, net	406.8	427.5
Goodwill	464.7	501.0
Other assets, net	30.1	24.8
Total assets	<u>\$ 925.0</u>	<u>\$ 980.1</u>
Liabilities:		
Current portion of debt and finance lease obligations	\$ 42.7	\$ 44.3
Other accrued and current liabilities	97.3	99.1
Long-term debt and finance lease obligations	5.0	6.0
Other long-term liabilities	56.3	38.1
Total liabilities	<u>\$ 201.3</u>	<u>\$ 187.5</u>

The operating results of UPC Poland for 2021 and 2020 are summarized in the following table. These amounts exclude intercompany revenue and expenses that are eliminated within our consolidated statements of operations.

	Year ended December 31,	
	2021	2020
	in millions	
Revenue	<u>\$ 454.8</u>	<u>\$ 434.7</u>
Operating income	<u>\$ 133.7</u>	<u>\$ 86.9</u>
Earnings before income taxes	<u>\$ 130.7</u>	<u>\$ 77.4</u>
Income tax expense	<u>(48.1)</u>	<u>(19.0)</u>
Net earnings attributable to Liberty Global shareholders	<u>\$ 82.6</u>	<u>\$ 58.4</u>

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The operating results of UPC Poland, the Vodafone Disposal Group and UPC DTH for 2019 are summarized in the following table. These amounts exclude intercompany revenue and expenses that are eliminated within our consolidated statement of operations.

	UPC Poland	Vodafone Disposal Group (a)	UPC DTH (b)	Total
	in millions			
Revenue	\$ 425.7	\$ 2,017.9	\$ 36.7	\$ 2,480.3
Operating income	\$ 85.6	\$ 1,165.6	\$ 10.7	\$ 1,261.9
Earnings before income taxes	\$ 85.9	\$ 994.7	\$ 9.5	\$ 1,090.1
Income tax expense	(19.0)	(273.9)	—	(292.9)
Net earnings attributable to Liberty Global shareholders	\$ 66.9	\$ 720.8	\$ 9.5	\$ 797.2

(a) Includes the operating results of the Vodafone Disposal Group through July 31, 2019, the date the Vodafone Disposal Group was sold.

(b) Includes the operating results of UPC DTH through May 2, 2019, the date UPC DTH was sold.

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(7) Investments

The details of our investments are set forth below:

<u>Accounting Method</u>	<u>December 31,</u>		<u>Ownership (a)</u>
	<u>2021</u>	<u>2020</u>	
	<u>in millions</u>		<u>%</u>
Equity (b):			
Long-term:			
VMO2 JV	\$ 13,774.7	\$ —	50.0
VodafoneZiggo JV (c)	2,572.4	3,052.3	50.0
Atlas Edge JV	163.7	—	50.0
All3Media Group (All3Media)	143.7	157.7	50.0
Formula E Holdings Ltd (Formula E)	115.9	105.8	35.7
Other	174.8	172.9	
Total — equity	<u>16,945.2</u>	<u>3,488.7</u>	
Fair value:			
Short-term:			
Separately-managed accounts (SMAs) (d)	2,269.6	1,600.2	
Long-term:			
ITV plc (ITV) (e)	596.3	581.0	9.9
SMAs (d)	531.7	365.7	
Univision Holdings Inc. (Univision)	385.5	100.0	10.9
Lacework Inc. (Lacework)	269.1	23.3	3.2
Plume Design, Inc. (Plume)	188.8	54.9	12.0
EdgeConneX Inc. (EdgeConneX)	138.7	75.1	5.5
Lions Gate Entertainment Corp (Lionsgate)	105.9	72.0	2.9
Aviatrix Systems, Inc. (Aviatrix)	78.2	7.3	3.8
CANAL+ Polska S.A.	70.8	92.3	17.0
Skillz Inc. (Skillz)	43.9	225.4	1.5
Other (f)	348.9	268.8	
Total — fair value	<u>5,027.4</u>	<u>3,466.0</u>	
Total investments (g)	<u>\$ 21,972.6</u>	<u>\$ 6,954.7</u>	
Short-term investments	<u>\$ 2,269.6</u>	<u>\$ 1,600.2</u>	
Long-term investments	<u>\$ 19,703.0</u>	<u>\$ 5,354.5</u>	

- (a) Our ownership percentages are determined based on our legal ownership as of the most recent balance sheet date or are estimated based on the number of shares we own and the most recent publicly-available information.
- (b) Our equity method investments are originally recorded at cost and are adjusted to recognize our share of net earnings or losses of the affiliates as they occur rather than as dividends or other distributions are received, with our recognition of losses generally limited to the extent of our investment in, and advances and commitments to, the investee. Accordingly, the carrying values of our equity method investments may not equal the respective fair values. At December 31, 2021 and 2020, the aggregate carrying amounts of our equity method investments exceeded our proportionate share of the respective investee's net assets by \$1,236.0 million and \$1,198.5 million, respectively, which include amounts associated with the VodafoneZiggo JV Receivables, as defined below, and amounts we are owed under a long-term note receivable from All3Media.

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- (c) Amounts include certain notes receivable due from a subsidiary of the VodafoneZiggo JV to a subsidiary of Liberty Global, comprising (i) a euro-denominated note receivable with a principal amount of \$797.1 million and \$855.8 million, respectively (the **VodafoneZiggo JV Receivable I**), and (ii) a euro-denominated note receivable with a principal amount of \$236.7 million and \$127.1 million, respectively (the **VodafoneZiggo JV Receivable II** and, together with the VodafoneZiggo JV Receivable I, the **VodafoneZiggo JV Receivables**). During 2021, an additional \$123.0 million was loaned under the VodafoneZiggo JV Receivable II to fund the VodafoneZiggo JV's final installment of spectrum license fees due to the Dutch government. The VodafoneZiggo JV Receivables bear interest at 5.55% and have a final maturity date of December 31, 2030. In 2019, we received a €100.0 million principal payment on the VodafoneZiggo JV Receivable I (\$112.1 million at the transaction date). During 2021, interest accrued on the VodafoneZiggo JV Receivables was \$56.5 million, all of which was cash settled.
- (d) Represents investments held under SMAs, which are maintained by investment managers acting as agents on our behalf. We classify, measure and report these investments, the composition of which may change from time to time, based on the underlying nature and characteristics of each security held under the SMAs. As of December 31, 2021, all of our investments held under SMAs were classified as available-for-sale debt securities, as further described in note 3. At December 31, 2021 and 2020, interest accrued on our debt securities, which is included in other current assets on our consolidated balance sheets, was \$5.1 million and \$7.1 million, respectively.
- (e) In connection with our investment in ITV, we previously entered into (i) the ITV Collar (as defined in note 8) and (ii) a related secured borrowing agreement (the **ITV Collar Loan**), each of which were fully settled during 2021, as further described in note 8.
- (f) Amounts include \$2.1 million and \$9.7 million, respectively, of noncontrolling junior interest in receivables we have securitized.
- (g) The purchase and sale of investments are presented on a gross basis in our consolidated statements of cash flows, including amounts associated with SMAs.

Equity Method Investments

The following table sets forth the details of our share of results of affiliates, net:

	Year ended December 31,		
	2021	2020	2019
	in millions		
VMO2 JV (a)	\$ (97.2)	\$ —	\$ —
VodafoneZiggo JV (b)	(32.0)	(201.1)	(185.9)
All3Media	(17.4)	(27.9)	(8.8)
Atlas Edge JV	(5.8)	—	—
Formula E	(2.5)	(8.4)	1.7
Other	(20.5)	(7.9)	(5.5)
Total	\$ (175.4)	\$ (245.3)	\$ (198.5)

- (a) Represents our 50% share of the results of operations of the VMO2 JV beginning June 1, 2021 and includes 100% of the share-based compensation expense associated with Liberty Global awards held by VMO2 JV employees who were formerly employees of Liberty Global, as these awards remain our responsibility.
- (b) Represents the net effect of (i) 100% of the interest income earned on the VodafoneZiggo JV Receivables and (ii) our 50% share of the results of operations of the VodafoneZiggo JV.

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VMO2 JV

On June 1, 2021, we completed the U.K. JV Transaction. Each of Liberty Global and Telefónica (each a “**U.K. JV Shareholder**”) holds 50% of the issued share capital of the VMO2 JV. The U.K. JV Shareholders intend for the VMO2 JV to be funded solely from its net cash flows from operations and third-party financing. We account for our 50% interest in the VMO2 JV as an equity method investment and consider the VMO2 JV to be a related party. For additional information regarding the U.K. JV Transaction, see note 4.

In connection with the formation of the VMO2 JV, the U.K. JV Shareholders entered into an agreement (the **U.K. JV Shareholders Agreement**) that contains customary provisions for the governance of a 50:50 joint venture and provides Liberty Global and Telefónica with joint control over decision making with respect to the VMO2 JV.

The U.K. JV Shareholders Agreement also provides (i) for a dividend policy that requires the VMO2 JV to distribute all unrestricted cash to the U.K. JV Shareholders on a pro rata basis (subject to the VMO2 JV maintaining a minimum amount of cash and complying with the terms of its financing arrangements) and (ii) that the VMO2 JV will be managed with a leverage ratio between 4.0 and 5.0 times EBITDA (as calculated pursuant to its existing financing arrangements), with the VMO2 JV undertaking periodic recapitalizations and/or refinancings accordingly. During 2021, we received a dividend distribution from the VMO2 JV of \$214.8 million, which was accounted for as a return on capital for purposes of our consolidated statement of cash flows.

Each U.K. JV Shareholder has the right to initiate an initial public offering (**IPO**) of the VMO2 JV after the third anniversary of the closing, with the opportunity for the other U.K. JV Shareholder to sell shares in the IPO on a pro rata basis. Subject to certain exceptions, the U.K. JV Shareholders Agreement prohibits transfers of interests in the VMO2 JV to third parties until the fifth anniversary of the closing. After the fifth anniversary, each U.K. JV Shareholder will be able to initiate a sale of all of its interest in the VMO2 JV to a third party and, under certain circumstances, initiate a sale of the entire VMO2 JV; subject, in each case, to a right of first offer in favor of the other U.K. JV Shareholder.

Pursuant to an agreement entered into in connection with the closing of the VMO2 JV (the **U.K. JV Framework Agreement**), Liberty Global provides certain services to the VMO2 JV on a transitional or ongoing basis (collectively, the **U.K. JV Services**). Pursuant to the terms of the U.K. JV Framework Agreement, the ongoing services will be provided for a period of two to six years depending on the type of service, while transitional services will be provided for a period of no less than 12 months, after which both parties shall be entitled to terminate based on specified notice periods. The U.K. JV Services provided by Liberty Global consist primarily of (i) technology and other services and (ii) capital-related expenditures for assets that will be used by or will otherwise benefit the VMO2 JV. Liberty Global charges both fixed and variable fees to the VMO2 JV for the U.K. JV Services it provides during the term of the U.K. JV Framework Agreement. During 2021, we recorded revenue of \$170.1 million related to the U.K. JV Services. At December 31, 2021, \$43.3 million was due from the VMO2 JV, primarily related to (a) services performed under the U.K. JV Framework Agreement and (b) amounts incurred by Liberty Global for certain equipment and licenses purchased on behalf of the VMO2 JV. Amounts due from the VMO2 JV will be periodically cash settled and are included in other current assets on our consolidated balance sheet.

The summarized results of operations of the VMO2 JV for the period June 1, 2021 through December 31, 2021 are set forth below (in millions):

Revenue	\$ 8,522.9
Loss before income taxes	\$ (351.6)
Net loss	\$ (164.9)

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The summarized financial position of the VMO2 JV as of December 31, 2021 is set forth below (in millions):

Current assets	\$ 4,961.3
Long-term assets	55,220.5
Total assets	\$ 60,181.8
Current liabilities	\$ 9,201.2
Long-term liabilities	23,433.2
Owners' equity	27,547.4
Total liabilities and owners' equity	\$ 60,181.8

VodafoneZiggo JV

Each of Liberty Global and Vodafone (each a "**NL JV Shareholder**") holds 50% of the issued share capital of the VodafoneZiggo JV. The NL JV Shareholders intend for the VodafoneZiggo JV to be funded solely from its net cash flows from operations and third-party financing. We account for our 50% interest in the VodafoneZiggo JV as an equity method investment and consider the VodafoneZiggo JV to be a related party.

In connection with the formation of the VodafoneZiggo JV, the NL JV Shareholders entered into an agreement (the **NL Shareholders Agreement**) that contains customary provisions for the governance of a 50:50 joint venture and provides Liberty Global and Vodafone with joint control over decision making with respect to the VodafoneZiggo JV.

The NL Shareholders Agreement also provides (i) for a dividend policy that requires the VodafoneZiggo JV to distribute all unrestricted cash to the NL JV Shareholders every two months (subject to the VodafoneZiggo JV maintaining a minimum amount of cash and complying with the terms of its financing arrangements) and (ii) that the VodafoneZiggo JV will be managed with a leverage ratio of between 4.5 and 5.0 times EBITDA (as calculated pursuant to its existing financing arrangements), with the VodafoneZiggo JV undertaking periodic recapitalizations and/or refinancings accordingly. During 2021, 2020 and 2019, we received dividend distributions from the VodafoneZiggo JV of \$311.7 million, \$249.5 million and \$162.7 million, respectively, which were accounted for as returns on capital for purposes of our consolidated statements of cash flows.

Each NL JV Shareholder has the right to initiate an IPO of the VodafoneZiggo JV, with the opportunity for the other NL JV Shareholder to sell shares in the IPO on a pro rata basis. As of January 1, 2021, each NL JV Shareholder has the right to initiate a sale of all of its interest in the VodafoneZiggo JV to a third party and, under certain circumstances, initiate a sale of the entire VodafoneZiggo JV, subject, in each case, to a right of first offer in favor of the other NL JV Shareholder.

Pursuant to an agreement (the **NL JV Framework Agreement**), Liberty Global provides certain services to the VodafoneZiggo JV (collectively, the **NL JV Services**). The NL JV Services provided by Liberty Global consist primarily of (i) technology and other services and (ii) capital-related expenditures for assets that will be used by, or will otherwise benefit, the VodafoneZiggo JV. Liberty Global charges both fixed and usage-based fees to the VodafoneZiggo JV for the NL JV Services provided during the term of the NL JV Framework Agreement. During 2021, 2020 and 2019, we recorded revenue from the VodafoneZiggo JV of \$222.0 million, \$178.9 million and \$189.1 million, respectively, primarily related to (a) the NL JV Services and (b) the sale of customer premises equipment to the VodafoneZiggo JV at a mark-up. In addition, during 2019, we purchased certain assets on the VodafoneZiggo JV's behalf with an aggregate cost of \$14.4 million. At December 31, 2021 and 2020, \$62.5 million and \$27.4 million, respectively, were due from the VodafoneZiggo JV related to the aforementioned transactions. The amounts due from the VodafoneZiggo JV, which are periodically cash settled, are included in other current assets on our consolidated balance sheets.

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The summarized results of operations of the VodafoneZiggo JV are set forth below:

	Year ended December 31,		
	2021	2020	2019
	in millions		
Revenue	\$ 4,824.2	\$ 4,565.4	\$ 4,407.8
Loss before income taxes	\$ (90.8)	\$ (287.2)	\$ (512.5)
Net loss	\$ (163.1)	\$ (448.7)	\$ (470.0)

The summarized financial position of the VodafoneZiggo JV is set forth below:

	December 31,	
	2021	2020
	in millions	
Current assets	\$ 896.2	\$ 1,067.2
Long-term assets	20,392.3	22,563.6
Total assets	\$ 21,288.5	\$ 23,630.8
Current liabilities	\$ 2,744.3	\$ 2,967.7
Long-term liabilities	15,381.0	16,450.8
Owners' equity	3,163.2	4,212.3
Total liabilities and owners' equity	\$ 21,288.5	\$ 23,630.8

Fair Value Investments

The following table sets forth the details of our realized and unrealized gains due to changes in fair values of certain investments, net:

	Year ended December 31,		
	2021	2020	2019
	in millions		
Univision	\$ 301.6	\$ —	\$ —
Lacework	223.9	1.1	—
Plume	133.9	29.6	—
Skillz	(100.4)	238.0	1.1
Aviatrix	65.4	—	—
Lionsgate	33.9	4.0	(25.0)
EdgeConneX	28.9	33.1	—
ITV	15.3	(217.1)	163.9
Other, net (a)	32.5	(52.9)	(41.0)
Total	\$ 735.0	\$ 35.8	\$ 99.0

(a) The 2021 amount includes gains of \$12.9 million related to investments that were sold during the year.

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Debt Securities

At December 31, 2021 and 2020, all of our SMAs were composed of debt securities, which are summarized in the following tables:

	December 31, 2021		
	Amortized cost basis	Accumulated unrealized losses	Fair value
	in millions		
Commercial paper	\$ 897.4	\$ —	\$ 897.4
Corporate debt securities	705.5	(1.6)	703.9
Government bonds	655.9	(3.3)	652.6
Certificates of deposit	355.5	(0.1)	355.4
Other debt securities	192.0	—	192.0
Total debt securities	<u>\$ 2,806.3</u>	<u>\$ (5.0)</u>	<u>\$ 2,801.3</u>

	December 31, 2020		
	Amortized cost basis	Accumulated unrealized gains	Fair value
	in millions		
Corporate debt securities	\$ 713.2	\$ 2.3	\$ 715.5
Commercial paper	523.7	0.6	524.3
Government bonds	474.8	0.2	475.0
Certificates of deposit	251.0	0.1	251.1
Total debt securities	<u>\$ 1,962.7</u>	<u>\$ 3.2</u>	<u>\$ 1,965.9</u>

During 2021 and 2020, we received proceeds from the sale of debt securities of \$6.1 billion and \$6.0 billion, respectively, the majority of which were reinvested in new debt securities held under SMAs. The sale of debt securities during 2021 and 2020 resulted in realized net gains (losses) of (\$2.0 million) and \$2.0 million, respectively.

The fair values of our debt securities as of December 31, 2021 by contractual maturity are shown below (in millions):

Due in one year or less	\$ 2,265
Due in one to five years	527
Due in five to ten years	3
Total (a)	<u>\$ 2,801</u>

(a) The weighted average life of our total debt securities was 0.5 years as of December 31, 2021.

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Notes to Consolidated Financial Statements — (Continued)
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(8) Derivative Instruments

In general, we enter into derivative instruments to protect against (i) increases in the interest rates on our variable-rate debt, (ii) foreign currency movements, particularly with respect to borrowings that are denominated in a currency other than the functional currency of the borrowing entity, and (iii) decreases in the market prices of certain publicly traded securities that we own. In this regard, through our subsidiaries, we have entered into various derivative instruments to manage interest rate exposure and foreign currency exposure, primarily with respect to the U.S. dollar (\$), the euro (€), the British pound sterling (£), the Swiss franc (CHF) and the Polish zloty (PLN). Generally, we do not apply hedge accounting to our derivative instruments. Accordingly, changes in the fair values of most of our derivative instruments are recorded in realized and unrealized gains or losses on derivative instruments, net, in our consolidated statements of operations.

The following table provides details of the fair values of our derivative instrument assets and liabilities:

	December 31, 2021			December 31, 2020		
	Current	Long-term	Total	Current	Long-term	Total
in millions						
Assets (a):						
Cross-currency and interest rate derivative contracts (b)	\$ 214.9	\$ 164.3	\$ 379.2	\$ 148.8	\$ 418.4	\$ 567.2
Equity-related derivative instruments (c)	—	113.8	113.8	49.3	231.6	280.9
Foreign currency forward and option contracts	28.4	—	28.4	36.5	0.1	36.6
Other	1.0	—	1.0	—	—	—
Total	<u>\$ 244.3</u>	<u>\$ 278.1</u>	<u>\$ 522.4</u>	<u>\$ 234.6</u>	<u>\$ 650.1</u>	<u>\$ 884.7</u>
Liabilities (a):						
Cross-currency and interest rate derivative contracts (b)	\$ 208.8	\$ 670.2	\$ 879.0	\$ 171.2	\$ 1,364.1	\$ 1,535.3
Foreign currency forward and option contracts	13.0	—	13.0	81.5	—	81.5
Total	<u>\$ 221.8</u>	<u>\$ 670.2</u>	<u>\$ 892.0</u>	<u>\$ 252.7</u>	<u>\$ 1,364.1</u>	<u>\$ 1,616.8</u>

- (a) Our current derivative assets, long-term derivative assets and long-term derivative liabilities are included in other current assets, other assets, net, and other long-term liabilities, respectively, on our consolidated balance sheets.
- (b) We consider credit risk relating to our and our counterparties' nonperformance in the fair value assessment of our derivative instruments. In all cases, the adjustments take into account offsetting liability or asset positions within each of our subsidiary borrowing groups (as defined and described in note 11). The changes in the credit risk valuation adjustments associated with our cross-currency and interest rate derivative contracts resulted in net gains (losses) of (\$10.7 million), \$336.0 million and \$16.6 million during 2021, 2020 and 2019, respectively. These amounts are included in realized and unrealized gains (losses) on derivative instruments, net, in our consolidated statements of operations. For further information regarding our fair value measurements, see note 9.
- (c) Our equity-related derivative instruments include warrants on our investment in Plume and, at December 31 2020, a share collar (the **ITV Collar**) with respect to certain of the shares of ITV held by our company. During 2021, we completed the unwind of the ITV Collar and cash settled all remaining amounts under the ITV Collar Loan. Accordingly, at December 31, 2021, the ITV Collar and ITV Collar Loan had been fully settled.

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The details of our realized and unrealized gains (losses) on derivative instruments, net, are as follows:

	Year ended December 31,		
	2021	2020	2019
	<i>in millions</i>		
Cross-currency and interest rate derivative contracts	\$ 578.9	\$ (1,184.3)	\$ (207.3)
Equity-related derivative instruments:			
ITV Collar	(11.8)	364.2	(84.4)
Other	85.6	22.5	21.0
Total equity-related derivative instruments	73.8	386.7	(63.4)
Foreign currency forward and option contracts	(31.8)	(81.1)	77.4
Other	2.0	—	0.1
Total	\$ 622.9	\$ (878.7)	\$ (193.2)

The net cash received or paid related to our derivative instruments is classified as an operating, investing or financing activity in our consolidated statements of cash flows based on the objective of the derivative instrument and the classification of the applicable underlying cash flows. The following table sets forth the classification of the net cash inflows of our derivative instruments:

	Year ended December 31,		
	2021	2020	2019
	<i>in millions</i>		
Operating activities	\$ (22.5)	\$ (55.9)	\$ 179.0
Investing activities	(107.1)	(39.8)	—
Financing activities	143.6	129.1	331.5
Total	\$ 14.0	\$ 33.4	\$ 510.5

Counterparty Credit Risk

We are exposed to the risk that the counterparties to the derivative instruments of our subsidiary borrowing groups will default on their obligations to us. We manage these credit risks through the evaluation and monitoring of the creditworthiness of, and concentration of risk with, the respective counterparties. In this regard, credit risk associated with our derivative instruments is spread across a relatively broad counterparty base of banks and financial institutions. Collateral is generally not posted by either party under our derivative instruments. At December 31, 2021, our exposure to counterparty credit risk included derivative assets with an aggregate fair value of \$57.8 million.

Each of our subsidiary borrowing groups have entered into derivative instruments under master agreements with each counterparty that contain master netting arrangements that are applicable in the event of early termination by either party to such derivative instrument. The master netting arrangements are limited to the derivative instruments governed by the relevant master agreement within each individual borrowing group and are independent of similar arrangements of our other subsidiary borrowing groups.

Under our derivative contracts, it is generally only the non-defaulting party that has a contractual option to exercise early termination rights upon the default of the other counterparty and to set off other liabilities against sums due upon such termination. However, in an insolvency of a derivative counterparty, under the laws of certain jurisdictions, the defaulting counterparty or its insolvency representatives may be able to compel the termination of one or more derivative contracts and trigger early termination payment liabilities payable by us, reflecting any mark-to-market value of the contracts for the counterparty. Alternatively, or in addition, the insolvency laws of certain jurisdictions may require the mandatory set off of amounts due under such derivative contracts against present and future liabilities owed to us under other contracts between us and the relevant counterparty. Accordingly, it is possible that we may be subject to obligations to make payments, or may have

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present or future liabilities owed to us partially or fully discharged by set off as a result of such obligations, in the event of the insolvency of a derivative counterparty, even though it is the counterparty that is in default and not us. To the extent that we are required to make such payments, our ability to do so will depend on our liquidity and capital resources at the time. In an insolvency of a defaulting counterparty, we will be an unsecured creditor in respect of any amount owed to us by the defaulting counterparty, except to the extent of the value of any collateral we have obtained from that counterparty.

In addition, where a counterparty is in financial difficulty, under the laws of certain jurisdictions, the relevant regulators may be able to (i) compel the termination of one or more derivative instruments, determine the settlement amount and/or compel, without any payment, the partial or full discharge of liabilities arising from such early termination that are payable by the relevant counterparty, or (ii) transfer the derivative instruments to an alternative counterparty.

Details of our Derivative Instruments

Cross-currency Derivative Contracts

We generally match the denomination of our subsidiaries' borrowings with the functional currency of the supporting operations or, when it is more cost effective, we provide for an economic hedge against foreign currency exchange rate movements by using derivative instruments to synthetically convert unmatched debt into the applicable underlying currency. At December 31, 2021, substantially all of our debt was either directly or synthetically matched to the applicable functional currencies of the underlying operations. The following table sets forth the total notional amounts and the related weighted average remaining contractual lives of our cross-currency swap contracts at December 31, 2021:

	Notional amount due from counterparty		Notional amount due to counterparty		Weighted average remaining life
	in millions				in years
UPC Holding	\$	360.0	€	318.1	3.8
	\$	4,650.0	CHF	4,256.9 (a)	6.4
	€	2,650.0	CHF	2,970.1	4.1
	PLN	2,999.5	€	653.5 (a)	4.5
	€	777.0	PLN	3,302.9 (a)	4.0
	CHF	740.0	€	701.1	1.0
Telenet	\$	3,940.0	€	3,489.6 (a)	5.1
	€	45.2	\$	50.0 (b)	3.1

(a) Includes certain derivative instruments that are "forward-starting," such that the initial exchange occurs at a date subsequent to December 31, 2021. These instruments are typically entered into in order to extend existing hedges without the need to amend existing contracts.

(b) Includes certain derivative instruments that do not involve the exchange of notional amounts at the inception and maturity of the instruments. Accordingly, the only cash flows associated with these derivative instruments are coupon-related payments and receipts.

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Interest Rate Swap Contracts

The following table sets forth the total U.S. dollar equivalents of the notional amounts and the related weighted average remaining contractual lives of our interest rate swap contracts at December 31, 2021:

	Pays fixed rate		Receives fixed rate	
	Notional amount in millions	Weighted average remaining life in years	Notional amount in millions	Weighted average remaining life in years
UPC Holding	\$ 6,917.4 (a)	3.3	\$ 4,583.7	4.3
Telenet	\$ 3,284.1 (a)	3.2	\$ 1,624.9	1.7

(a) Includes forward-starting derivative instruments.

Interest Rate Swap Options

From time to time, we enter into interest rate swap options (**swaptions**) which give us the right, but not the obligation, to enter into certain interest rate swap contracts at set dates in the future. Such contracts typically have a life of no more than three years. At December 31, 2021, the option expiration period on each of our swaptions had expired.

Basis Swaps

Our basis swaps involve the exchange of attributes used to calculate our floating interest rates, including (i) the benchmark rate, (ii) the underlying currency and/or (iii) the borrowing period. We typically enter into these swaps to optimize our interest rate profile based on our current evaluations of yield curves, our risk management policies and other factors. The following table sets forth the total U.S. dollar equivalents of the notional amounts and related weighted average remaining contractual lives of our basis swap contracts at December 31, 2021:

	Notional amount due from counterparty in millions	Weighted average remaining life in years
UPC Holding	\$ 5,250.0 (a)	0.5
Telenet	\$ 4,590.0 (a)	0.5

(a) Includes forward-starting derivative instruments.

Interest Rate Caps, Floors and Collars

From time to time, we enter into interest rate cap, floor and collar agreements. Purchased interest rate caps and collars lock in a maximum interest rate if variable rates rise, but also allow our company to benefit, to a limited extent in the case of collars, from declines in market rates. Purchased interest rate floors protect us from interest rates falling below a certain level, generally to match a floating rate floor on a debt instrument. At December 31, 2021, we had no interest rate collar agreements, and the total U.S. dollar equivalents of the notional amounts of our purchased interest rate caps and floors were \$1,480.3 million and \$8,491.1 million, respectively.

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Impact of Derivative Instruments on Borrowing Costs

The impact of the derivative instruments that mitigate our foreign currency and interest rate risk, as described above, on our borrowing costs is as follows:

	Increase (decrease) to borrowing costs at December 31, 2021 (a)
VM Ireland	0.42 %
Telenet	0.23 %
UPC Holding	(0.14)%
Total increase to borrowing costs	0.05 %

(a) Represents the effect of derivative instruments in effect at December 31, 2021 and does not include forward-starting derivative instruments.

Foreign Currency Forwards and Options

Certain of our subsidiaries enter into foreign currency forward and option contracts with respect to non-functional currency exposure, including deal-contingent hedges of the proceeds expected from the sale of UPC Poland. As of December 31, 2021, the total U.S. dollar equivalent of the notional amounts of our foreign currency forward and option contracts was \$2.5 billion.

(9) Fair Value Measurements

We use the fair value method to account for (i) certain of our investments and (ii) our derivative instruments. The reported fair values of these investments and derivative instruments as of December 31, 2021 are unlikely to represent the value that will be paid or received upon the ultimate settlement or disposition of these assets and liabilities.

GAAP provides for a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. Level 1 inputs are quoted market prices in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date. Level 2 inputs are inputs other than quoted market prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. Level 3 inputs are unobservable inputs for the asset or liability. We record transfers of assets or liabilities into or out of Levels 1, 2 or 3 at the beginning of the quarter during which the transfer occurred. During 2021, no material transfers were made.

All of our Level 2 inputs (interest rate futures, swap rates and certain of the inputs for our weighted average cost of capital calculations) and certain of our Level 3 inputs (forecasted volatilities and credit spreads) are obtained from pricing services. These inputs, or interpolations or extrapolations thereof, are used in our internal models to calculate, among other items, yield curves, forward interest and currency rates and weighted average cost of capital rates. In the normal course of business, we receive market value assessments from the counterparties to our derivative contracts. Although we compare these assessments to our internal valuations and investigate unexpected differences, we do not otherwise rely on counterparty quotes to determine the fair values of our derivative instruments. The midpoints of applicable bid and ask ranges generally are used as inputs for our internal valuations.

For our investments in publicly-traded companies, the recurring fair value measurements are based on the quoted closing price of the respective shares at each reporting date. Accordingly, the valuations of these investments fall under Level 1 of the fair value hierarchy. Our other investments that we account for at fair value are privately-held companies, and therefore, quoted market prices are unavailable. The valuation technique we use for such investments is a combination of an income approach (discounted cash flow model based on forecasts) and a market approach (transactions with new third-party investors or market multiples of similar businesses). With the exception of certain inputs for our weighted average cost of capital calculations that are derived from pricing services, the inputs used to value these investments are based on unobservable inputs derived from our assumptions. Therefore, the valuation of our privately-held investments falls under Level 3 of the fair value hierarchy. Any

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reasonably foreseeable changes in assumed levels of unobservable inputs for the valuations of our Level 3 investments would not be expected to have a material impact on our financial position or results of operations.

The recurring fair value measurements of our equity-related derivative instruments are based on standard option pricing models, which require the input of observable and unobservable variables such as exchange-traded equity prices, risk-free interest rates, dividend forecasts and forecasted volatilities of the underlying equity securities. The valuations of our equity-related derivative instruments are based on a combination of Level 1 inputs (exchange-traded equity prices), Level 2 inputs (interest rate futures and swap rates) and Level 3 inputs (forecasted volatilities). As changes in volatilities could have a significant impact on the overall valuations over the terms of the derivative instruments, we have determined that these valuations fall under Level 3 of the fair value hierarchy. At December 31, 2021, our equity-related derivatives were not significantly impacted by forecasted volatilities.

In order to manage our interest rate and foreign currency exchange risk, we have entered into various derivative instruments, as further described in note 8. The recurring fair value measurements of these instruments are determined using discounted cash flow models. Most of the inputs to these discounted cash flow models consist of, or are derived from, observable Level 2 data for substantially the full term of these instruments. This observable data mostly includes currency rates, interest rate futures and swap rates, which are retrieved or derived from available market data. Although we may extrapolate or interpolate this data, we do not otherwise alter this data in performing our valuations. We classify deal-contingent hedges under Level 3 of the fair value hierarchy, as we adjust the valuations to reflect an internal judgement of the probability of the completion of the deal, which is unobservable. We use a Monte Carlo based approach to incorporate a credit risk valuation adjustment in our fair value measurements to estimate the impact of both our own nonperformance risk and the nonperformance risk of our counterparties. The inputs used for our credit risk valuations, including our and our counterparties' credit spreads, represent our most significant Level 3 inputs, and these inputs are used to derive the credit risk valuation adjustments with respect to these instruments. As we would not expect these parameters to have a significant impact on the valuations of these instruments, we have determined that these valuations fall under Level 2 of the fair value hierarchy. Our credit risk valuation adjustments with respect to our cross-currency and interest rate swaps are quantified and further explained in note 8.

Fair value measurements are also used in connection with nonrecurring valuations performed in connection with acquisition accounting, impairment assessments and the accounting for our initial investment in the VMO2 JV. These nonrecurring valuations include the valuation of reporting units, customer relationships and other intangible assets, property and equipment, the implied value of goodwill and the valuation of our initial investment in the VMO2 JV. The valuation of reporting units and our initial investment in the VMO2 JV are based at least in part on discounted cash flow analyses. With the exception of certain inputs for our weighted average cost of capital and discount rate calculations that are derived from pricing services, the inputs used in our discounted cash flow analyses, such as forecasts of future cash flows, including inputs with respect to revenue growth and Adjusted EBITDA margin (as defined in note 19), and terminal growth rates, are based on our assumptions. The valuation of customer relationships is primarily based on an excess earnings methodology, which is a form of a discounted cash flow analysis. The excess earnings methodology requires us to estimate the specific cash flows expected from the customer relationship, considering such factors as estimated customer life, the revenue expected to be generated over the life of the customer relationship, contributory asset charges and other factors. Tangible assets are typically valued using a replacement or reproduction cost approach, considering factors such as current prices of the same or similar equipment, the age of the equipment and economic obsolescence. The implied value of goodwill is determined by allocating the fair value of a reporting unit to all of the assets and liabilities of that unit as if the reporting unit had been acquired in a business combination, with the residual amount allocated to goodwill. Most of our nonrecurring valuations use significant unobservable inputs and therefore fall under Level 3 of the fair value hierarchy. During 2021, we performed a nonrecurring valuation for the purpose of determining the fair value of our initial investment in the VMO2 JV, and the weighted average cost of capital used to value our initial investment was 6.9%. During 2020, we performed a nonrecurring fair value measurement associated with the Sunrise Acquisition. The weighted average discount rate used in the valuation of the customer relationships acquired in connection with the Sunrise Acquisition was 6.75%. For information regarding our investment in the VMO2 JV, see note 7. For information regarding our acquisitions, see note 5.

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A summary of our assets and liabilities that are measured at fair value on a recurring basis is as follows:

Description	Fair value measurements at December 31, 2021 using:			
	December 31, 2021	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
	in millions			
Assets:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 379.2	\$ —	\$ 379.2	\$ —
Equity-related derivative instruments	113.8	—	—	113.8
Foreign currency forward and option contracts	28.4	—	9.0	19.4
Other	1.0	—	1.0	—
Total derivative instruments	522.4	—	389.2	133.2
Investments:				
SMAs	2,801.3	672.1	2,124.2	5.0
Other investments	2,226.1	747.9	70.8	1,407.4
Total investments	5,027.4	1,420.0	2,195.0	1,412.4
Total assets	\$ 5,549.8	\$ 1,420.0	\$ 2,584.2	\$ 1,545.6
Liabilities:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 879.0	\$ —	\$ 846.3	\$ 32.7
Foreign currency forward and option contracts	13.0	—	13.0	—
Total liabilities	\$ 892.0	\$ —	\$ 859.3	\$ 32.7

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Description	Fair value measurements at December 31, 2020 using:			
	December 31, 2020	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
	in millions			
Assets:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 567.2	\$ —	\$ 567.2	\$ —
Equity-related derivative instruments	280.9	—	—	280.9
Foreign currency forward and option contracts	36.6	—	36.6	—
Total derivative instruments	884.7	—	603.8	280.9
Investments:				
SMAs	1,965.9	405.7	1,560.2	—
Other investments	1,500.1	888.2	92.3	519.6
Total investments	3,466.0	1,293.9	1,652.5	519.6
Total assets	\$ 4,350.7	\$ 1,293.9	\$ 2,256.3	\$ 800.5
Liabilities:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 1,535.3	\$ —	\$ 1,535.3	\$ —
Foreign currency forward and option contracts	81.5	—	81.5	—
Total liabilities	\$ 1,616.8	\$ —	\$ 1,616.8	\$ —

A reconciliation of the beginning and ending balances of our assets and liabilities measured at fair value on a recurring basis using significant unobservable, or Level 3, inputs is as follows:

	Investments	Cross-currency, interest rate and foreign currency derivative contracts	Equity-related derivative instruments	Total
	in millions			
Balance of net assets at January 1, 2021	\$ 519.6	\$ —	\$ 280.9	\$ 800.5
Gains included in earnings from continuing operations (a):				
Realized and unrealized gains on derivative instruments, net	—	—	73.7	73.7
Realized and unrealized gains due to changes in fair values of certain investments and debt, net	814.4	165.9	—	980.3
Settlement of ITV Collar	—	—	(240.8)	(240.8)
Additions	105.6	—	—	105.6
Derivative instruments contributed to the VMO2 JV in connection with the U.K. JV Transaction	—	(179.3)	—	(179.3)
Foreign currency translation adjustments and other, net	(27.2)	0.1	—	(27.1)
Balance of net assets at December 31, 2021	\$ 1,412.4	\$ (13.3)	\$ 113.8	\$ 1,512.9

(a) Amounts primarily relate to assets and liabilities that we continue to carry on our consolidated balance sheet as of December 31, 2021.

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(10) Long-lived Assets

Property and Equipment, Net

The details of our property and equipment and the related accumulated depreciation are set forth below:

	Estimated useful life at December 31, 2021	December 31,	
		2021	2020
		in millions	
Distribution systems	3 to 30 years	\$ 9,472.8	\$ 9,646.4
Customer premises equipment	3 to 7 years	1,279.2	1,447.7
Support equipment, buildings and land	3 to 33 years	4,310.5	4,366.7
Total property and equipment, gross		15,062.5	15,460.8
Accumulated depreciation		(8,081.0)	(7,834.2)
Total property and equipment, net		\$ 6,981.5	\$ 7,626.6

Depreciation expense related to our property and equipment was \$1,883.2 million, \$2,053.0 million and \$3,021.6 million during 2021, 2020 and 2019, respectively.

During 2021, 2020 and 2019, we recorded non-cash increases to our property and equipment related to vendor financing arrangements (including amounts related to the U.K. JV Entities through the closing of the U.K. JV Transaction) of \$661.1 million, \$1,339.6 million and \$1,710.7 million, respectively, which exclude related VAT of \$84.7 million, \$226.6 million and \$283.7 million, respectively, that were also financed under these arrangements.

Goodwill

Changes in the carrying amount of our goodwill during 2021 are set forth below:

	January 1, 2021	Acquisitions and related adjustments	Foreign currency translation adjustments and other	December 31, 2021
in millions				
Switzerland	\$ 6,816.0	\$ 18.6	\$ (244.1)	\$ 6,590.5
Belgium	2,783.7	(0.8)	(191.1)	2,591.8
Ireland	296.2	—	(20.3)	275.9
Central and Other	69.8	—	(4.6)	65.2
Total	\$ 9,965.7	\$ 17.8	\$ (460.1)	\$ 9,523.4

If, among other factors, (i) our equity values were to decline or (ii) the adverse impacts of economic, competitive, regulatory or other factors were to cause our results of operations or cash flows to be worse than anticipated, we could conclude in future periods that impairment charges are required in order to reduce the carrying values of our goodwill and, to a lesser extent, other long-lived assets. Any such impairment charges could be significant.

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Changes in the carrying amount of our goodwill during 2020 are set forth below:

	January 1, 2020	Acquisitions and related adjustments	Reclassification to assets held for sale (a)	Foreign currency translation adjustments and other	December 31, 2020
	in millions				
Switzerland	\$ 2,953.2	\$ 3,465.7	\$ —	\$ 397.1	\$ 6,816.0
Belgium	2,576.1	6.7	—	200.9	2,783.7
U.K.	7,693.3	—	(7,918.5)	225.2	—
Ireland	272.1	—	—	24.1	296.2
Central and Other	63.6	0.6	—	5.6	69.8
Total	<u>\$ 13,558.3</u>	<u>\$ 3,473.0</u>	<u>\$ (7,918.5)</u>	<u>\$ 852.9</u>	<u>\$ 9,965.7</u>

(a) Represents goodwill of the U.K. JV Entities. For additional information regarding the held-for-sale presentation of the U.K. JV Entities, see note 6.

Intangible Assets Subject to Amortization, Net

The details of our intangible assets subject to amortization are set forth below:

		December 31, 2021			December 31, 2020		
Estimated useful life at December 31, 2021		Gross carrying amount	Accumulated amortization	Net carrying amount	Gross carrying amount	Accumulated amortization	Net carrying amount
in millions							
Customer relationships	5 to 11 years	\$ 2,336.2	\$ (602.2)	\$ 1,734.0	\$ 2,411.6	\$ (237.5)	\$ 2,174.1
Other	2 to 15 years	1,034.3	(425.8)	608.5	1,072.1	(366.3)	705.8
Total		<u>\$ 3,370.5</u>	<u>\$ (1,028.0)</u>	<u>\$ 2,342.5</u>	<u>\$ 3,483.7</u>	<u>\$ (603.8)</u>	<u>\$ 2,879.9</u>

Amortization expense related to intangible assets with finite useful lives was \$470.5 million, \$174.2 million and \$524.7 million during 2021, 2020 and 2019, respectively. Based on our amortizable intangible asset balances at December 31, 2021, we expect that amortization expense will be as follows for the next five years and thereafter (in millions):

2022	\$ 440.0
2023	427.1
2024	416.4
2025	412.4
2026	375.8
Thereafter	270.8
Total	<u>\$ 2,342.5</u>

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(11) Debt

The U.S. dollar equivalents of the components of our debt are as follows:

	December 31, 2021					
	Weighted average interest rate (a)	Unused borrowing capacity (b)		Principal amount		
		Borrowing currency	U.S. \$ equivalent	December 31,		
				2021	2020	
				in millions		
UPC Holding Bank Facility (c)	2.88 %	€ 715.2	\$ 814.4	\$ 4,062.5	\$ 4,767.1	
UPC SPE Notes	4.43 %	—	—	1,933.2	1,393.7	
UPC Holding Senior Notes	4.59 %	—	—	1,211.6	1,261.5	
Telenet Credit Facility (d)	2.15 %	€ 555.0	632.0	3,558.9	3,652.0	
Telenet Senior Secured Notes	4.74 %	—	—	1,614.9	1,660.2	
VM Ireland Credit Facility (e)	3.50 %	€ 100.0	113.9	1,024.9	—	
Vendor financing (f)	1.78 %	—	—	843.2	1,099.6	
ITV Collar Loan (g)	—	—	—	—	415.9	
Other	7.08 %	—	—	149.6	266.3	
Total debt before deferred financing costs, discounts and premiums (h)	3.28 %		\$ 1,560.3	\$ 14,398.8	\$ 14,516.3	

The following table provides a reconciliation of total debt before deferred financing costs, discounts and premiums to total debt and finance lease obligations:

	December 31,	
	2021	2020
	in millions	
Total debt before deferred financing costs, discounts and premiums	\$ 14,398.8	\$ 14,516.3
Deferred financing costs, discounts and premiums, net	(57.7)	(118.4)
Total carrying amount of debt	14,341.1	14,397.9
Finance lease obligations (note 12)	484.0	549.5
Total debt and finance lease obligations	14,825.1	14,947.4
Current maturities of debt and finance lease obligations	(850.3)	(1,086.1)
Long-term debt and finance lease obligations	\$ 13,974.8	\$ 13,861.3

- (a) Represents the weighted average interest rate in effect at December 31, 2021 for all borrowings outstanding pursuant to each debt instrument, including any applicable margin. The interest rates presented represent stated rates and do not include the impact of derivative instruments, deferred financing costs, original issue premiums or discounts and commitment fees, all of which affect our overall cost of borrowing. Including the effects of derivative instruments, original issue premiums or discounts and commitment fees, but excluding the impact of deferred financing costs, the weighted average interest rate on our aggregate variable- and fixed-rate indebtedness was 3.38% at December 31, 2021. For information regarding our derivative instruments, see note 8.
- (b) Unused borrowing capacity represents the maximum availability under the applicable facility at December 31, 2021 without regard to covenant compliance calculations or other conditions precedent to borrowing. The following table provides our borrowing availability and amounts available to loan or distribute under each of the respective subsidiary facilities, based on the most restrictive applicable leverage covenants and leverage-based restricted payment tests, (i) at

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December 31, 2021 and (ii) upon completion of the relevant December 31, 2021 compliance reporting requirements. These amounts do not consider any actual or potential changes to our borrowing levels or any amounts loaned or distributed subsequent to December 31, 2021, or the impact of additional amounts that may be available to borrow, loan or distribute under certain defined baskets within each respective facility.

		Availability			
		December 31, 2021		Upon completion of the relevant December 31, 2021 compliance reporting requirements	
		Borrowing currency	U.S. \$ equivalent	Borrowing currency	U.S. \$ equivalent
in millions					
Available to borrow:					
UPC Holding Bank Facility	€	715.2	\$ 814.4	€	715.2 \$ 814.4
Telenet Credit Facility	€	555.0	\$ 632.0	€	555.0 \$ 632.0
VM Ireland Credit Facility	€	100.0	\$ 113.9	€	100.0 \$ 113.9
Available to loan or distribute:					
UPC Holding Bank Facility	€	715.2	\$ 814.4	€	637.0 \$ 725.3
Telenet Credit Facility	€	555.0	\$ 632.0	€	555.0 \$ 632.0
VM Ireland Credit Facility	€	81.6	\$ 92.9	€	100.0 \$ 113.9

- (c) Unused borrowing capacity under the UPC Holding Bank Facility relates to an equivalent €715.2 million (\$814.4 million) under the UPC Revolving Facility, part of which has been made available as an ancillary facility. During 2021, the UPC Revolving Facility was amended to provide for maximum borrowing capacity of €736.4 million (\$838.5 million), including €23.0 million (\$26.2 million) under the related ancillary facility. With the exception of €21.2 million (\$24.1 million) of borrowings under the ancillary facility, the UPC Revolving Facility was undrawn at December 31, 2021.
- (d) Unused borrowing capacity under the Telenet Credit Facility comprises (i) €510.0 million (\$580.7 million) under the Telenet Revolving Facility I, (ii) €25.0 million (\$28.5 million) under the Telenet Overdraft Facility and (iii) €20.0 million (\$22.8 million) under the Telenet Revolving Facility, each of which were undrawn at December 31, 2021.
- (e) Unused borrowing capacity under the VM Ireland Credit Facility relates to €100.0 million (\$113.9 million) under the VM Ireland Revolving Facility (as defined below), which was undrawn at December 31, 2021.
- (f) Represents amounts owed to various creditors pursuant to interest-bearing vendor financing arrangements that are used to finance certain of our property and equipment additions and operating expenses. These arrangements extend our repayment terms beyond a vendor's original due dates (e.g. extension beyond a vendor's customary payment terms, which are generally 90 days or less) and as such are classified outside of accounts payable as debt on our consolidated balance sheets. These obligations are generally due within one year and include VAT that was also financed under these arrangements. For purposes of our consolidated statements of cash flows, operating-related expenses financed by an intermediary are treated as constructive operating cash outflows and constructive financing cash inflows when the intermediary settles the liability with the vendor as there is no actual cash outflow until we pay the financing intermediary. During 2021 and 2020, the constructive cash outflow included in cash flows from operating activities and the corresponding constructive cash inflow included in cash flows from financing activities related to these operating expenses was \$1,781.6 million and \$2,754.5 million, respectively. Repayments of vendor financing obligations at the time we pay the financing intermediary are included in repayments and repurchases of debt and finance lease obligations in our consolidated statements of cash flows.
- (g) As described in note 8, the ITV Collar Loan was fully repaid during the second quarter of 2021.

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- (h) As of December 31, 2021 and 2020, our debt had an estimated fair value of \$14.5 billion and \$14.7 billion, respectively. The estimated fair values of our debt instruments are generally determined using the average of applicable bid and ask prices (mostly Level 1 of the fair value hierarchy). For additional information regarding fair value hierarchies, see note 9.

General Information

At December 31, 2021, most of our outstanding debt had been incurred by one of our three subsidiary “borrowing groups.” References to these borrowing groups, which comprise UPC Holding, Telenet and VM Ireland, include their respective restricted parent and subsidiary entities.

Credit Facilities. Each of our borrowing groups has entered into one or more credit facility agreements with certain financial and other institutions. Each of these credit facilities contain certain covenants, the more notable of which are as follows:

- Our credit facilities contain certain consolidated net leverage ratios, as specified in the relevant credit facility, which are required to be complied with (i) on an incurrence basis and/or (ii) when the associated revolving credit facilities have been drawn beyond a specified percentage of the total available revolving credit commitments on a maintenance basis;
- Subject to certain customary and agreed exceptions, our credit facilities contain certain restrictions which, among other things, restrict the ability of the members of the relevant borrowing group to (i) incur or guarantee certain financial indebtedness, (ii) make certain disposals and acquisitions, (iii) create certain security interests over their assets and (iv) make certain restricted payments to their direct and/or indirect parent companies (and indirectly to Liberty Global) through dividends, loans or other distributions;
- Our credit facilities require that certain members of the relevant borrowing group guarantee the payment of all sums payable under the relevant credit facility and such group members are required to grant first-ranking security over their shares and, in certain borrowing groups, over substantially all of their assets to secure the payment of all sums payable thereunder;
- In addition to certain mandatory prepayment events, our credit facilities provide that the instructing group of lenders under the relevant credit facility, under certain circumstances, may cancel the group’s commitments thereunder and declare the loan(s) thereunder due and payable after the applicable notice period following the occurrence of a change of control (as specified in the relevant credit facility);
- Our credit facilities contain certain customary events of default, the occurrence of which, subject to certain exceptions, materiality qualifications and cure rights, would allow the instructing group of lenders to (i) cancel the total commitments, (ii) declare that all or part of the loans be payable on demand and/or (iii) accelerate all outstanding loans and terminate their commitments thereunder;
- Our credit facilities require members of the relevant borrowing group to observe certain affirmative and negative undertakings and covenants, which are subject to certain materiality qualifications and other customary and agreed exceptions; and
- In addition to customary default provisions, our credit facilities generally include certain cross-default or cross-acceleration provisions with respect to other indebtedness of members of the relevant borrowing group, subject to agreed minimum thresholds and other customary and agreed exceptions.

Senior and Senior Secured Notes. Certain of our borrowing groups have issued senior and/or senior secured notes. In general, our senior and senior secured notes (i) are senior obligations of each respective issuer within the relevant borrowing group that rank equally with all of the existing and future senior debt of such issuer and are senior to all existing and future subordinated debt of such issuer within the relevant borrowing group, (ii) contain, in most instances, certain guarantees from other members of the relevant borrowing group (as specified in the applicable indenture) and (iii) with respect to our senior secured notes, are secured by certain pledges or liens over the shares of certain members of the relevant borrowing group and,

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in certain borrowing groups, over substantially all of their assets. In addition, the indentures governing our senior and senior secured notes contain certain covenants, the more notable of which are as follows:

- Our notes contain certain customary incurrence-based covenants. In addition, our notes provide that any failure to pay principal at its stated maturity (after giving effect to any applicable grace period) of, or any acceleration with respect to, other indebtedness of the issuer or certain subsidiaries over agreed minimum thresholds (as specified under the applicable indenture) is an event of default under the respective notes;
- Subject to certain customary and agreed exceptions, our notes contain certain restrictions that, among other things, restrict the ability of the members of the relevant borrowing group to (i) incur or guarantee certain financial indebtedness, (ii) make certain disposals and acquisitions, (iii) create certain security interests over their assets and (iv) make certain restricted payments to its direct and/or indirect parent companies (and indirectly to Liberty Global) through dividends, loans or other distributions;
- If the relevant issuer or certain of its subsidiaries (as specified in the applicable indenture) sell certain assets, such issuer must, subject to certain customary and agreed exceptions, offer to repurchase the applicable notes at par, or if a change of control (as specified in the applicable indenture) occurs, such issuer must offer to repurchase all of the relevant notes at a redemption price of 101%;
- Our senior secured notes contain certain early redemption provisions including the ability to, during each 12-month period commencing on the issue date for such notes until the applicable call date, redeem up to 10% of the principal amount of the notes at a redemption price equal to 103% of the principal amount of the notes to be redeemed plus accrued and unpaid interest; and
- Our notes are non-callable prior to their respective call date (as specified under the applicable indenture). At any time prior to the applicable call date, we may redeem some or all of the applicable notes by paying a “make-whole” premium, which is the present value of all remaining scheduled interest payments to the applicable call date using the discount rate as of the redemption date plus a premium (as specified in the applicable indenture). On or after the applicable call date, we may redeem some or all of these notes at various redemption prices plus accrued interest and additional amounts (as specified in the applicable indenture), if any, to the applicable redemption date.

SPE Notes. From time to time, we create special purpose financing entities (**SPEs**), some of which are owned by the relevant borrowing group and some of which are owned by third parties (**Third-Party SPEs**). These SPEs are created for the primary purpose of facilitating the offering of senior secured notes, which we collectively refer to as “**SPE Notes**”.

The SPEs use the proceeds from the issuance of SPE Notes to fund term loan facilities under the credit facilities made available to their respective borrowing group, each a “**Funded Facility**” and collectively the “**Funded Facilities**.” Each SPE is dependent on payments from the relevant borrowing entity under the applicable Funded Facility in order to service its payment obligations under each respective SPE Note. Each of the Funded Facility term loans creates a variable interest in the respective Third-Party SPE for which the relevant borrowing entity is the primary beneficiary. Accordingly, such Third-Party SPEs are consolidated by the relevant parent entities, including Liberty Global. As a result, the amounts outstanding under the Funded Facilities of the SPEs owned by the relevant borrowing group and the Third-Party SPEs are eliminated in the consolidated financial statements of the respective borrowing group and Liberty Global. At December 31, 2021, we had outstanding SPE Notes issued by a Third-Party SPE consolidated by UPC Holding (the **UPCB SPE**).

Pursuant to the respective indentures for the SPE Notes (the **SPE Indentures**) and the respective accession agreements for the Funded Facilities, the call provisions, maturity dates and applicable interest rates for each Funded Facility are the same as those of the related SPE Notes. The SPEs, as lenders under the relevant Funded Facility for the relevant borrowing group, are treated the same as the other lenders under the respective credit facility, with benefits, rights and protections similar to those afforded to the other lenders. Through the covenants in the applicable SPE Indentures and the applicable security interests over the relevant SPE’s rights under the applicable Funded Facility granted to secure the relevant SPE’s obligations under the relevant SPE Notes, the holders of the SPE Notes are provided indirectly with the benefits, rights, protections and covenants granted to the SPEs as lenders under the applicable Funded Facility. The SPEs are prohibited from incurring any additional indebtedness, subject to certain exceptions under the SPE Indentures.

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The SPE Notes are non-callable prior to their respective call date (as specified under the applicable SPE Indenture). If, however, at any time prior to the applicable call date, all or a portion of the loans under the related Funded Facility are voluntarily prepaid (a **SPE Early Redemption Event**), then the SPE will be required to redeem an aggregate principal amount of its respective SPE Notes equal to the aggregate principal amount of the loans prepaid under the relevant Funded Facility. In general, the redemption price payable will equal 100% of the principal amount of the applicable SPE Notes to be redeemed and a “make-whole” premium, which is the present value of all remaining scheduled interest payments to the applicable call date using the discount rate as of the redemption date plus a premium (as specified in the applicable SPE Indenture).

Upon the occurrence of a SPE Early Redemption Event on or after the applicable call date, the SPE will redeem an aggregate principal amount of its respective SPE Notes equal to the principal amount prepaid under the related Funded Facility at a redemption price (expressed as a percentage of the principal amount) plus accrued and unpaid interest and additional amounts (as specified in the applicable SPE Indenture), if any, to the applicable redemption date.

Financing Transactions

Below we provide summary descriptions of certain financing transactions completed during 2021, 2020 and 2019. A portion of our financing transactions may include non-cash borrowings and repayments. During 2021, 2020 and 2019, non-cash borrowings and repayments aggregated \$2.9 billion, \$3.5 billion and \$3.3 billion, respectively, including amounts related to the U.K. JV Entities prior to completion of the U.K. JV Transaction.

UPC Holding - 2021 Financing Transactions

During 2021, UPC Holding completed a number of financing transactions that generally resulted in lower interest rates and extended maturities, including the issuance of certain senior secured notes and the entrance into certain accession agreements under the UPC Holding Bank Facility. In connection with these transactions, UPC Holding recognized an aggregate loss on debt extinguishment of \$90.6 million related to (i) the write-off of \$77.7 million of unamortized deferred financing costs and discounts and (ii) the payment of \$12.9 million of redemption premiums. In September 2021, Liberty Global entered into an agreement to sell UPC Poland, the proceeds of which are expected to be used, in part, to repay a portion of UPC Holding’s outstanding indebtedness. For additional information, see note 6.

The following tables summarize our outstanding indebtedness as of December 31, 2021 with respect to (i) the UPC Holding Bank Facility and (ii) the UPC SPE Notes, after completion of the aforementioned financing transactions.

UPC Holding Bank Facility	Maturity	Interest rate	Facility amount (borrowing currency) (a)	Unused borrowing capacity	Outstanding principal amount	Carrying value (b)
in millions						
AQ (c)	June 15, 2029	3.625%	€ 600.0	\$ —	\$ 683.2	\$ 679.3
AT (d)	April 30, 2028	LIBOR + 2.25%	\$ 700.0	—	700.0	696.9
AU (e)	April 30, 2029	EURIBOR + 2.5%	€ 400.0	—	455.5	453.4
AX (d)	January 31, 2029	LIBOR + 3.0%	\$ 1,925.0	—	1,925.0	1,910.4
AY (e)	January 31, 2029	EURIBOR + 3.0%	€ 862.5	—	982.0	976.7
AZ (c)	July 15, 2031	4.875%	\$ 1,250.0	—	1,250.0	1,248.6
UPC Revolving Facility (f)	May 31, 2026	EURIBOR + 2.5%	€ 736.4	814.4	—	—
Elimination of Facilities AQ and AZ in consolidation (c)				—	(1,933.2)	(1,927.9)
Total				\$ 814.4	\$ 4,062.5	\$ 4,037.4

(a) Except as described in (c) below, amounts represent total third-party facility amounts at December 31, 2021.

(b) Amounts are net of deferred financing costs and discounts, where applicable.

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- (c) The amounts outstanding under UPC Facilities AQ and AZ are eliminated in our consolidated financial statements.
- (d) UPC Facilities AT and AX are each subject to a LIBOR floor of 0.0%.
- (e) UPC Facilities AU and AY are each subject to a EURIBOR floor of 0.0%.
- (f) The UPC Revolving Facility has a fee on unused commitments of 1.0% per year.

PC SPE Notes	Maturity	Interest rate	Original issue amount	Outstanding principal amount		Carrying value (a)
				Borrowing currency	U.S. \$ equivalent	
				in millions		
2031 UPC Senior Secured Notes	July 15, 2031	4.875%	\$ 1,250.0	\$ 1,250.0	\$ 1,250.0	1,248.6
<i>Third-Party SPE:</i>						
UPCB Finance VII Euro Notes	June 15, 2029	3.625%	€ 600.0	600.0	683.2	679.3
Total				\$	<u>1,933.2</u>	<u>1,927.9</u>

(a) Amounts are net of deferred financing costs and discounts, where applicable.

UPC Holding - 2020 and 2019 Financing Transactions

During 2020 and 2019, UPC Holding completed a number of financing transactions that generally resulted in lower interest rates and extended maturities. In connection with these transactions, UPC Holding recognized losses on debt extinguishment of \$43.1 million and \$15.4 million during 2020 and 2019, respectively. These losses primarily include (i) during 2020, the payment of \$43.8 million of redemption premiums and (ii) the write-off of net unamortized deferred financing costs, discounts and premiums of \$0.3 million and \$15.4 million, respectively.

Telenet - 2020 and 2019 Financing Transactions

During 2020 and 2019, Telenet completed a number of financing transactions that generally resulted in lower interest rates and extended maturities. In connection with these transactions, Telenet recognized losses on debt extinguishment of \$18.9 million and \$54.7 million during 2020 and 2019, respectively. These losses include (i) the write-off of net unamortized deferred financing costs, discounts and premiums of \$18.9 million and \$4.3 million, respectively, and (ii) during 2019, the payment of \$50.4 million of redemption premiums.

VM Ireland - 2021 Financing Transactions

In June 2021, VM Ireland entered into a credit facility (the **VM Ireland Credit Facility**), comprising (i) a €900.0 million (\$1,024.9 million) term loan facility (**VM Ireland Facility B1**) and (ii) a €100.0 million (\$113.9 million) revolving facility (the **VM Ireland Revolving Facility**). VM Ireland Facility B1 was issued at 99.5% of par, matures on July 15, 2029 and bears interest at a rate of EURIBOR + 3.5%, subject to a EURIBOR floor of 0.0%. The VM Ireland Revolving Facility matures on September 15, 2027 and bears interest at a rate of EURIBOR + 2.75%. The proceeds from VM Ireland Facility B1 and the VM Ireland Revolving Facility can be used for general corporate purposes.

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Maturities of Debt

Maturities of our debt as of December 31, 2021 are presented below for the named entity and its subsidiaries, unless otherwise noted, and represent U.S. dollar equivalents based on December 31, 2021 exchange rates.

	Telenet	UPC Holding (a)	VM Ireland	Other	Total
	in millions				
Year ending December 31:					
2022	\$ 405.8	\$ 307.6	\$ —	\$ 69.6	\$ 783.0
2023	11.3	—	—	54.9	66.2
2024	11.1	—	—	16.0	27.1
2025	11.2	—	—	1.2	12.4
2026	11.3	—	—	—	11.3
Thereafter	5,266.6	7,207.3	1,024.9	—	13,498.8
Total debt maturities (b)	5,717.3	7,514.9	1,024.9	141.7	14,398.8
Deferred financing costs, discounts and premiums, net	(14.2)	(36.4)	(7.1)	—	(57.7)
Total debt	\$ 5,703.1	\$ 7,478.5	\$ 1,017.8	\$ 141.7	\$ 14,341.1
Current portion	\$ 405.8	\$ 307.6	\$ —	\$ 69.6	\$ 783.0
Noncurrent portion	\$ 5,297.3	\$ 7,170.9	\$ 1,017.8	\$ 72.1	\$ 13,558.1

(a) Amounts include SPE Notes issued by the UPCB SPE which, as described above, is consolidated by UPC Holding and Liberty Global.

(b) Amounts include vendor financing obligations of \$843.2 million, as set forth below:

	Telenet	UPC Holding	Other	Total
	in millions			
Year ending December 31:				
2022	\$ 393.9	\$ 307.6	\$ 69.6	\$ 771.1
2023	—	—	54.9	54.9
2024	—	—	16.0	16.0
2025	—	—	1.2	1.2
Total vendor financing maturities	\$ 393.9	\$ 307.6	\$ 141.7	\$ 843.2
Current portion	\$ 393.9	\$ 307.6	\$ 69.6	\$ 771.1
Noncurrent portion	\$ —	\$ —	\$ 72.1	\$ 72.1

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Vendor Financing Obligations

A reconciliation of the beginning and ending balances of our vendor financing obligations for the indicated periods is set forth below:

	2021	2020
	in millions	
Balance at January 1	\$ 1,099.6	\$ 1,344.9
Vendor financing obligations of the U.K. JV Entities at January 1	2,805.8	2,382.4
Balance at January 1, including amounts classified as held for sale	3,905.4	3,727.3
Operating-related vendor financing additions	1,781.6	2,754.5
Capital-related vendor financing additions	661.1	1,339.6
Principal payments on operating-related vendor financing	(1,408.0)	(2,381.7)
Principal payments on capital-related vendor financing	(964.4)	(2,088.8)
Foreign currency, acquisitions and other	108.8	554.5
Total vendor financing obligations	4,084.5	3,905.4
Less: vendor financing obligations of the U.K. JV Entities (a)	(3,241.3)	(2,805.8)
Balance at December 31	<u>\$ 843.2</u>	<u>\$ 1,099.6</u>

(a) The 2021 amount represents vendor financing obligations of the U.K. JV Entities at June 1, 2021, the date of completion of the U.K. JV Transaction.

(12) Leases

General

We enter into operating and finance leases for network equipment, real estate, mobile site sharing and vehicles. We provide residual value guarantees on certain of our vehicle leases.

Lease Balances

A summary of our ROU assets and lease liabilities is set forth below:

	December 31,	
	2021	2020
	in millions	
ROU assets:		
Finance leases (a)	\$ 426.0	\$ 471.6
Operating leases (b)	1,327.8	1,440.3
Total ROU assets	<u>\$ 1,753.8</u>	<u>\$ 1,911.9</u>
Lease liabilities:		
Finance leases (c)	\$ 484.0	\$ 549.5
Operating leases (d)	1,364.8	1,432.0
Total lease liabilities	<u>\$ 1,848.8</u>	<u>\$ 1,981.5</u>

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- (a) Our finance lease ROU assets are included in property and equipment, net, on our consolidated balance sheets. At December 31, 2021, the weighted average remaining lease term for finance leases was 22.5 years and the weighted average discount rate was 6.0%. During 2021, 2020 and 2019, we recorded non-cash additions to our finance lease ROU assets (including amounts related to the U.K. JV Entities through the closing of the U.K. JV Transaction) of \$42.6 million, \$48.7 million and \$66.4 million, respectively.
- (b) Our operating lease ROU assets are included in other assets, net, on our consolidated balance sheets. At December 31, 2021, the weighted average remaining lease term for operating leases was 12.4 years and the weighted average discount rate was 5.7%. During 2021, 2020 and 2019, we recorded non-cash additions to our operating lease ROU assets (including amounts related to the U.K. JV Entities through the closing of the U.K. JV Transaction) of \$169.8 million, \$123.0 million and \$83.2 million, respectively.
- (c) The current and long-term portions of our finance lease liabilities are included within current portion of debt and finance lease obligations and long-term debt and finance lease obligations, respectively, on our consolidated balance sheets.
- (d) The current portion of our operating lease liabilities are included within other accrued and current liabilities on our consolidated balance sheets.

A summary of our aggregate lease expense is set forth below:

	Year ended December 31,		
	2021	2020	2019
	in millions		
Finance lease expense:			
Depreciation and amortization	\$ 74.8	\$ 74.8	\$ 83.5
Interest expense	30.8	32.9	33.3
Total finance lease expense	105.6	107.7	116.8
Operating lease expense (a)	249.7	146.2	130.5
Short-term lease expense (a)	5.0	4.6	6.0
Variable lease expense (b)	1.6	1.4	1.2
Total lease expense	\$ 361.9	\$ 259.9	\$ 254.5

- (a) Our operating lease expense and short-term lease expense are included in programming and other direct costs of services, other operating expenses, SG&A expenses and impairment, restructuring and other operating items, net, in our consolidated statements of operations.
- (b) Variable lease expense represents payments made to a lessor during the lease term that vary because of a change in circumstance that occurred after the lease commencement date. Variable lease payments are expensed as incurred and are included in other operating expenses in our consolidated statements of operations.

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A summary of our cash outflows from operating and finance leases is set forth below:

	Year ended December 31,		
	2021	2020	2019
	in millions		
Cash paid for amounts included in the measurement of lease liabilities:			
Operating cash outflows from operating leases	\$ 223.0	\$ 121.5	\$ 130.3
Operating cash outflows from finance leases (interest component)	30.8	32.9	33.3
Financing cash outflows from finance leases (principal component)	75.7	86.0	72.9
Total cash outflows from operating and finance leases	<u>\$ 329.5</u>	<u>\$ 240.4</u>	<u>\$ 236.5</u>

Maturities of our operating and finance lease liabilities as of December 31, 2021 are presented below. Amounts represent U.S. dollar equivalents based on December 31, 2021 exchange rates:

	Operating leases	Finance leases
	in millions	
Year ending December 31:		
2022	\$ 208.3	\$ 92.9
2023	190.7	103.6
2024	174.9	62.2
2025	161.6	58.8
2026	148.6	54.7
Thereafter	1,078.4	251.3
Total payments	1,962.5	623.5
Less: present value discount	(597.7)	(139.5)
Present value of lease payments	<u>\$ 1,364.8</u>	<u>\$ 484.0</u>
Current portion	<u>\$ 138.7</u>	<u>\$ 67.3</u>
Noncurrent portion	<u>\$ 1,226.1</u>	<u>\$ 416.7</u>

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(13) Income Taxes

Liberty Global files its primary income tax return in the U.K. Its subsidiaries file income tax returns in the U.S., the U.K. and a number of other European jurisdictions. The income taxes of Liberty Global and its subsidiaries are presented on a separate return basis for each tax-paying entity or group.

The components of our earnings (loss) from continuing operations before income taxes are as follows:

	Year ended December 31,		
	2021	2020	2019
	in millions		
U.K.	\$ 12,922.0	\$ (1,470.0)	\$ (831.0)
The Netherlands	644.5	(606.0)	(662.8)
Belgium	404.7	343.5	409.3
Luxembourg	373.2	95.5	(5.3)
Switzerland	(308.3)	(21.2)	178.5
U.S.	(3.7)	(46.0)	(7.0)
Intercompany activity with discontinued operations	(54.2)	(75.0)	(278.7)
Other	22.6	(21.8)	(44.9)
Total	<u>\$ 14,000.8</u>	<u>\$ (1,801.0)</u>	<u>\$ (1,241.9)</u>

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Income tax benefit (expense) consists of:

	Current	Deferred	Total
	in millions		
Year ended December 31, 2021:			
U.K.	\$ (0.4)	\$ (319.5)	\$ (319.9)
U.S. (a)	(47.9)	(25.8)	(73.7)
Belgium	(96.3)	16.2	(80.1)
Switzerland	(7.2)	63.5	56.3
Luxembourg	(0.4)	(49.5)	(49.9)
The Netherlands	(2.6)	(1.3)	(3.9)
Other	(0.3)	(1.8)	(2.1)
Total	\$ (155.1)	\$ (318.2)	\$ (473.3)
Year ended December 31, 2020:			
U.S. (a)	\$ 81.5	\$ 159.7	\$ 241.2
U.K.	(1.3)	52.2	50.9
Switzerland	(3.5)	41.2	37.7
Luxembourg	(0.3)	(27.1)	(27.4)
Belgium	(54.5)	36.3	(18.2)
The Netherlands	(7.7)	—	(7.7)
Other	(1.2)	0.6	(0.6)
Total	\$ 13.0	\$ 262.9	\$ 275.9
Year ended December 31, 2019:			
The Netherlands	\$ —	\$ (275.3)	\$ (275.3)
Belgium	(134.7)	3.6	(131.1)
U.K.	(1.5)	118.8	117.3
U.S. (a)	(4.1)	81.9	77.8
Switzerland	(27.8)	(1.1)	(28.9)
Luxembourg	(1.2)	7.7	6.5
Other	(0.2)	(0.1)	(0.3)
Total	\$ (169.5)	\$ (64.5)	\$ (234.0)

(a) Includes federal and state income taxes. Our U.S. state income taxes were not material during any of the years presented.

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Income tax benefit (expense) attributable to our earnings (loss) from continuing operations before income taxes differs from the amounts computed using the applicable income tax rate as a result of the following factors:

	Year ended December 31,		
	2021	2020	2019
	in millions		
Computed “expected” tax benefit (expense) (a)	\$ (2,660.2)	\$ 342.2	\$ 236.0
Non-taxable gain associated with the U.K. JV Transaction	2,066.0	—	—
Non-deductible or non-taxable foreign currency exchange results	218.0	(395.1)	(26.5)
International rate differences (b)	(92.4)	6.7	8.5
Basis and other differences in the treatment of items associated with investments in subsidiaries and affiliates (c)	84.0	(245.8)	(165.0)
Non-deductible or non-taxable interest and other expenses	(69.0)	(25.1)	(191.9)
Change in valuation allowances	(62.2)	(8.4)	(113.6)
Tax benefit associated with technologies innovation (d)	25.8	62.2	—
Recognition of previously unrecognized tax benefits	20.5	285.8	5.9
Enacted tax law and rate changes (e)	2.2	248.2	19.2
Other, net	(6.0)	5.2	(6.6)
Total income tax benefit (expense)	<u>\$ (473.3)</u>	<u>\$ 275.9</u>	<u>\$ (234.0)</u>

- (a) The statutory or “expected” tax rate is the U.K. rate of 19.0%.
- (b) Amounts reflect adjustments (either a benefit or expense) to the “expected” tax benefit (expense) for statutory rates in jurisdictions in which we operate outside of the U.K.
- (c) Amounts reflect the net impact of differences in the treatment of income and loss items between financial reporting and tax accounting related to investments in subsidiaries and affiliates, including the effects of foreign earnings.
- (d) Amounts reflect the recognition of the innovation income tax deduction in Belgium, including the one-time effect of deductions related to prior periods in 2020.
- (e) On June 10, 2021, legislation was enacted in the U.K. to increase the U.K. corporate income rate to 25.0% from April 1, 2023. The impact of this rate change on our deferred tax balances was recorded during the second quarter of 2021. On July 22, 2020, legislation was enacted in the U.K. to maintain the corporate income tax rate at 19.0%, reversing previous legislation that had reduced the U.K. rate to 17.0% from April 1, 2020. The impact of this rate change on our deferred tax balances was recorded during the third quarter of 2020. In addition, over the past three years, there have been several changes to the enacted corporate tax rate in the Netherlands, the most recent of which in December 2021 increased the corporate income tax rate from 25.0% to 25.8% effective January 1, 2022. The changes to the enacted corporate tax rate in the Netherlands have not had a material impact on our consolidated financial statements.

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The components of our net deferred tax liabilities are as follows:

	December 31,	
	2021	2020
	<i>in millions</i>	
Deferred tax assets (a)	\$ 423.4	\$ 565.1
Deferred tax liabilities (a)	(544.5)	(653.3)
Net deferred tax liability	<u>\$ (121.1)</u>	<u>\$ (88.2)</u>

(a) Our deferred tax assets and deferred tax liabilities are included within other assets, net, and other long-term liabilities, respectively, on our consolidated balance sheets.

The tax effects of temporary differences that give rise to significant portions of our deferred tax assets and deferred tax liabilities are presented below:

	December 31,	
	2021	2020
	<i>in millions</i>	
Deferred tax assets:		
Net operating loss and other carryforwards	\$ 1,482.5	\$ 1,589.8
Investments	242.1	194.6
Debt	180.3	218.6
Derivative instruments	145.2	272.3
Property and equipment, net	135.8	107.5
Leases	58.2	200.2
Other future deductible amounts	207.8	213.1
Deferred tax assets	<u>2,451.9</u>	<u>2,796.1</u>
Valuation allowance	(1,744.6)	(1,578.9)
Deferred tax assets, net of valuation allowance	<u>707.3</u>	<u>1,217.2</u>
Deferred tax liabilities:		
Intangible assets	(418.4)	(513.5)
Property and equipment, net	(188.9)	(220.7)
Debt	(159.3)	(182.3)
ROU assets	(54.0)	(201.6)
Deferred revenue	(2.9)	(155.6)
Other future taxable amounts	(4.9)	(31.7)
Deferred tax liabilities	<u>(828.4)</u>	<u>(1,305.4)</u>
Net deferred tax liability	<u>\$ (121.1)</u>	<u>\$ (88.2)</u>

Our deferred income tax valuation allowance increased \$165.7 million in 2021. This increase reflects the net effect of (i) enacted tax law and rate changes, (ii) foreign currency translation adjustments, (iii) a decrease in deferred tax assets, (iv) net tax expense of \$62.2 million and (v) other individually insignificant items.

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The significant components of our tax loss carryforwards and related tax assets at December 31, 2021 are as follows:

Country	Tax loss carryforward	Related tax asset	Expiration date
	in millions		
The Netherlands	\$ 2,747.2	\$ 708.8	Indefinite
Belgium	1,205.5	301.4	Indefinite
Luxembourg	933.0	243.4	Various
U.K.	601.6	150.4	Indefinite
Ireland	597.5	75.0	Indefinite
Other	11.8	3.5	Various
Total	<u>\$ 6,096.6</u>	<u>\$ 1,482.5</u>	

Our tax loss carryforwards within each jurisdiction combine all companies' tax losses (both capital and ordinary losses) in that jurisdiction, however, certain tax jurisdictions limit the ability to offset taxable income of a separate company or different tax group with the tax losses associated with another separate company or group. Further, tax jurisdictions restrict the type of taxable income that the above losses are able to offset. The majority of the tax losses shown in the above table are not expected to be realized, including certain losses that are limited in use due to change in control or same business tests.

We have taxable outside basis differences on certain investments in non-U.S. subsidiaries. No additional income taxes have been provided for any undistributed foreign earnings, or any additional outside basis difference inherent in these entities, as these amounts continue to be reinvested in foreign operations. At December 31, 2021, we have not provided deferred tax liabilities on an estimated \$1.4 billion of cumulative temporary differences on the outside bases of our non-U.S. subsidiaries.

Through our subsidiaries, we maintain a presence in many countries. Many of these countries maintain highly complex tax regimes that differ significantly from the system of income taxation used in the U.K. and the U.S. We have accounted for the effect of these taxes based on what we believe is reasonably expected to apply to us and our subsidiaries based on tax laws currently in effect and reasonable interpretations of these laws.

We and our subsidiaries file consolidated and standalone income tax returns in various jurisdictions. In the normal course of business, our income tax filings are subject to review by various taxing authorities. In connection with such reviews, disputes could arise with the taxing authorities over the interpretation or application of certain income tax rules related to our business in that tax jurisdiction. Such disputes may result in future tax and interest and penalty assessments by these taxing authorities. The ultimate resolution of tax contingencies will take place upon the earlier of (i) the settlement date with the applicable taxing authorities in either cash or agreement of income tax positions or (ii) the date when the tax authorities are statutorily prohibited from adjusting the company's tax computations.

In general, tax returns filed by our company or our subsidiaries for years prior to 2010 are no longer subject to examination by tax authorities. Certain of our subsidiaries are currently involved in income tax examinations in various jurisdictions in which we operate, including Belgium, Ireland, and the U.S. While we do not expect adjustments from the foregoing examinations to have a material impact on our consolidated financial position, results of operations or cash flows, no assurance can be given that this will be the case given the amounts involved and the complex nature of the related issues.

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The changes in our unrecognized tax benefits for the indicated periods are summarized below:

	2021	2020	2019
	<i>in millions</i>		
Balance at January 1	\$ 602.5	\$ 662.4	\$ 855.2
Reductions for tax positions of prior years	(170.0)	(361.5)	(80.7)
Additions based on tax positions related to the current year	14.3	290.6	1.7
Additions for tax positions of prior years	12.9	134.1	1.8
Foreign currency translation	(8.7)	15.5	(4.3)
Lapse of statute of limitations	(3.9)	(2.7)	—
Reduction related to the held for sale group	—	(131.8)	—
Settlements with tax authorities	—	(4.1)	(111.3)
Balance at December 31	<u>\$ 447.1</u>	<u>\$ 602.5</u>	<u>\$ 662.4</u>

No assurance can be given that any of these tax benefits will be recognized or realized.

As of December 31, 2021, 2020 and 2019, there were \$378.7 million, \$418.2 million, and \$543.7 million, respectively, of unrecognized tax benefits that would have a favorable impact on our effective income tax rate if ultimately recognized, after considering amounts that we would expect to be offset by valuation allowances and other factors.

During 2022, we do not expect any material reductions to our unrecognized tax benefits related to tax positions taken as of December 31, 2021. No assurance can be given as to the nature or impact of any changes in our unrecognized tax positions during 2022.

During 2021, 2020 and 2019, the income tax expense of our continuing operations included net income tax expense of \$25.7 million, \$26.3 million and \$22.4 million, respectively, representing the net accrual of interest and penalties during the period. At December 31, 2021, our other long-term liabilities included accrued interest and penalties of \$164.9 million.

(14) Equity

Capitalization

At December 31, 2021, our authorized share capital consisted of an aggregate nominal amount of \$20.0 million, consisting of any of the following: (i) ordinary shares (Class A, B or C), each with a nominal value of \$0.01 per share, (ii) preference shares, with a nominal value to be determined by the board of directors, the issuance of one or more classes or series of which may be authorized by the board of directors, and (iii) any other shares of one or more classes as may be determined by the board of directors or by the shareholders of Liberty Global.

Under Liberty Global's Articles of Association, effective July 1, 2015, holders of Liberty Global Class A ordinary shares are entitled to one vote for each such share held, and holders of Liberty Global Class B ordinary shares are entitled to 10 votes for each such share held, on all matters submitted to a vote of Liberty Global shareholders at any general meeting (annual or special). Holders of Liberty Global Class C ordinary shares are not entitled to any voting powers except as required by law.

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At the option of the holder, each Liberty Global Class B ordinary share is convertible into one Liberty Global Class A ordinary share. One Liberty Global Class A ordinary share is reserved for issuance for each Liberty Global Class B ordinary share that is issued (12,930,839 shares issued as of December 31, 2021). Additionally, at December 31, 2021, we have reserved the following ordinary shares for the issuance of outstanding share-based incentive awards:

	Class A	Class C
Options	530,518	2,244,752
SARs	21,077,203	49,605,813
RSUs	2,625,839	5,250,912
PSUs and PSARS	4,286,083	8,572,171

Subject to any preferential rights of any outstanding class of our preference shares, the holders of our ordinary shares are entitled to dividends as may be declared from time to time by our board of directors from funds available therefore. Except with respect to share distributions, whenever a dividend is paid in cash to the holder of one class of our ordinary shares, we shall also pay to the holders of the other classes of our ordinary shares an equal per share dividend. There are currently no contractual restrictions on our ability to pay dividends in cash or shares.

In the event of our liquidation, dissolution or winding up, after payment or provision for payment of our debts and liabilities and subject to the prior payment in full of any preferential amounts to which our preference shareholders, if any, may be entitled, the holders of our ordinary shares will be entitled to receive their proportionate interests, expressed in liquidation units, in any assets available for distribution to our ordinary shares.

Share Repurchase Programs

As a U.K. incorporated company, we may only elect to repurchase shares or pay dividends to the extent of our “Distributable Reserves.” Distributable Reserves, which are not linked to a GAAP reported amount, may be created through the earnings of the U.K. parent company and, among other methods, through a reduction in share premium approved by the English Companies Court. Based on the amounts set forth in our 2020 U.K. Companies Act Report dated April 30, 2021, which are our most recent “Relevant Accounts” for purposes of determining our Distributable Reserves under U.K. law, our Distributable Reserves were \$14.9 billion as of December 31, 2020. This amount does not reflect earnings, share repurchases or other activity that occurred during 2021, each of which impacts the amount of our Distributable Reserves.

Our board of directors has approved various share repurchase programs for our Liberty Global ordinary shares. Under our repurchase programs, we may acquire from time to time our Class A ordinary shares, Class C ordinary shares or any combination of Class A and Class C ordinary shares. Our repurchase programs may be effected through open market transactions and/or privately negotiated transactions, which may include derivative transactions. The timing of the repurchase of shares pursuant to these programs will depend on a variety of factors, including market conditions and applicable law, and these programs may be implemented in conjunction with brokers for the company and other financial institutions with whom the company has relationships within certain preset parameters and purchases may continue during closed periods in accordance with applicable restrictions. Our share repurchase programs may be suspended or discontinued at any time. In July 2021, our board of directors approved a new share repurchase program pursuant to which we are authorized to repurchase 10% of our shares during each of 2022 and 2023, based on the total number of our outstanding shares as of the beginning of each respective year. As determined by our total number of outstanding shares as of December 31, 2021, we are authorized to repurchase 52.75 million of our Class A and/or Class C ordinary shares during 2022. Based on the respective closing share prices as of December 31, 2021, this would equate to total share repurchases during 2022 of approximately \$1.5 billion. However, the actual U.S. dollar amount of our share repurchases during 2022 will be determined by the actual transaction date share prices during the year and could differ significantly from this amount.

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The following table provides details of our share repurchases during 2021, 2020 and 2019:

	Class A ordinary shares		Class C ordinary shares		Total cost (a) in millions
	Shares repurchased	Average price paid per share (a)	Shares repurchased	Average price paid per share (a)	
2021	8,445,800	\$ 27.31	49,604,048	\$ 27.23	\$ 1,581.1
2020	1,309,000	\$ 22.38	54,473,323	\$ 19.15	\$ 1,072.3
2019 (b)	24,348,562	\$ 27.61	95,395,291	\$ 26.64	\$ 3,220.2

(a) Includes direct acquisition costs, where applicable.

(b) Includes repurchases made pursuant to modified Dutch auction cash tenders, comprising 24,002,262 shares of our Class A ordinary shares at a price per share of \$27.50 and 75,420,009 shares of our Class C ordinary shares at a price per share of \$27.00, for an aggregate purchase price of \$2.7 billion, including direct acquisition costs.

Subsidiary Distributions

From time to time, Telenet and certain other of our subsidiaries make cash distributions to their respective shareholders. Our share of these distributions is eliminated in consolidation and the noncontrolling interest owners' share of these distributions is reflected as a charge against noncontrolling interests in our consolidated statements of equity. In this regard, Telenet paid aggregate dividends to its shareholders during 2021, 2020 and 2019 of €306.2 million, €292.4 million and €62.8 million, respectively. Our share of these dividends was €182.4 million (\$214.0 million at the applicable rate), €177.8 million (\$205.4 million at the applicable rate) and €37.8 million (\$42.0 million at the applicable rate), respectively.

Restricted Net Assets

The ability of certain of our subsidiaries to distribute or loan all or a portion of their net assets to our company is limited by the terms of applicable debt facilities. At December 31, 2021, a significant portion of our net assets represented net assets of our subsidiaries that were subject to such limitations.

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(15) Share-based Compensation

Our share-based compensation expense primarily relates to the share-based incentive awards issued by Liberty Global to its employees and employees of its subsidiaries. A summary of our aggregate share-based compensation expense is set forth below:

	Year ended December 31,		
	2021	2020	2019
	in millions		
Liberty Global:			
Performance-based incentive awards (a)	\$ 59.6	\$ 127.4	\$ 134.5
Non-performance based incentive awards (b)	168.6	134.1	107.6
Other (c)	33.6	46.2	39.0
Total Liberty Global	261.8	307.7	281.1
Telenet share-based incentive awards (d)	35.1	35.5	15.6
Other	11.2	4.8	9.1
Total	\$ 308.1	\$ 348.0	\$ 305.8
Included in:			
Other operating expenses	\$ 13.7	\$ 7.6	\$ 3.9
SG&A expenses	294.4	340.4	301.9
Total	\$ 308.1	\$ 348.0	\$ 305.8

- (a) Includes share-based compensation expense related to (i) PSUs, (ii) our 2019 CEO Performance Award and (iii) our 2019 Challenge Performance Awards, each as defined and described below.
- (b) In 2019, we changed our policy to provide that all new equity grants would have ten-year contractual terms in order to more closely align with common market practice. In April 2021, with respect to 2014 and 2015 grants, and in April 2020, with respect to 2013 grants, the compensation committee of our board of directors approved the extension dates of outstanding SARs and director options from a seven-year term to a ten-year term. Accordingly, the Black-Scholes fair values of the respective outstanding awards increased, resulting in the recognition of an aggregate incremental share-based compensation expense of \$22.7 million and \$18.9 million during 2021 and 2020, respectively. The 2019 amount includes share-based compensation expense related to the RSAs issued under the 2019 CEO Performance Award, as defined and described below.
- (c) Represents annual incentive compensation and defined contribution plan liabilities that have been or are expected to be settled with Liberty Global ordinary shares. In the case of the annual incentive compensation, shares have been or will be issued to senior management and key employees pursuant to a shareholding incentive program. The shareholding incentive program allows these employees to elect to receive up to 100% of their annual incentive compensation in ordinary shares of Liberty Global in lieu of cash.
- (d) Represents the share-based compensation expense associated with Telenet's share-based incentive awards, which, at December 31, 2021, included performance- and non-performance-based stock option awards with respect to 4,126,221 Telenet shares. These stock option awards had a weighted average exercise price of €39.73 (\$45.24).

As of December 31, 2021, \$243.8 million of total unrecognized compensation cost related to our Liberty Global share-based incentive awards is expected to be recognized by our company over a weighted-average period of approximately 1.8 years.

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The following table summarizes certain information related to the share-based incentive awards granted and exercised with respect to Liberty Global ordinary shares (includes amounts related to awards held by employees of our discontinued operations, unless otherwise noted):

	Year ended December 31,		
	2021	2020	2019
Assumptions used to estimate fair value of options, SARs and PSARs granted:			
Risk-free interest rate	0.48 - 1.13%	0.13 - 0.47%	1.59 - 2.45%
Expected life	3.7-6.2 years	3.2-6.2 years	3.2-6.2 years
Expected volatility	30.8 - 33.2%	34.6 - 38.8%	29.9 - 33.8%
Expected dividend yield	none	none	none
Weighted average grant-date fair value per share of awards granted:			
Options	\$ 8.75	\$ 5.92	\$ 8.60
SARs	\$ 6.79	\$ 4.19	\$ 6.79
PSARs	(a)	(a)	\$ 6.92
RSUs	\$ 25.69	\$ 15.66	\$ 24.66
RSAs	(a)	(a)	\$ 25.29
PSUs	(a)	(a)	\$ 25.00
Total intrinsic value of awards exercised (in millions):			
Options	\$ 1.4	\$ 1.2	\$ 4.2
SARs	\$ 28.9	(b)	\$ 13.6
PSARs	\$ 0.1	(b)	(b)
Cash received from exercise of options (in millions)	\$ 8.9	\$ 2.2	\$ 2.3
Income tax benefit related to share-based compensation of our continuing operations (in millions)	\$ 14.9	\$ 36.9	\$ 21.0

(a) There were no grants of this award type made during the indicated period.

(b) There were no exercises of this award type made during the indicated period.

Share Incentive Plans — Liberty Global Ordinary Shares

Incentive Plans

As of December 31, 2021, we are authorized to grant incentive awards under the “**Liberty Global 2014 Incentive Plan**” and the “**Liberty Global 2014 Nonemployee Director Incentive Plan**”. Generally, we may grant non-qualified share options, SARs, PSARs, restricted shares, RSUs, cash awards, performance awards or any combination of the foregoing under either of these incentive plans (collectively, “**awards**”). Ordinary shares issuable pursuant to awards made under these incentive plans will be made available from either authorized but unissued shares or shares that have been issued but reacquired by our company. Awards may be granted at or above fair value in any class of ordinary shares. The maximum number of Liberty Global shares with respect to which awards may be issued under the Liberty Global 2014 Incentive Plan and the Liberty Global 2014 Nonemployee Director Incentive Plan is 155 million (of which no more than 50.25 million shares may consist of Class B ordinary shares) and 10.5 million, respectively, in each case, subject to anti-dilution and other adjustment provisions in the respective plan. As of December 31, 2021, the Liberty Global 2014 Incentive Plan and the Liberty Global 2014 Nonemployee Director Incentive Plan had 49,290,093 and 7,678,752 ordinary shares available for grant, respectively.

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Awards (other than performance-based awards) under the Liberty Global 2014 Incentive Plan generally (i) vest (a) prior to 2020, 12.5% on the six-month anniversary of the grant date and then at a rate of 6.25% each quarter thereafter and (b) commencing in 2020, annually over a three-year period, and (ii) expire (1) prior to 2019, seven years after the grant date and (2) commencing in 2019, 10 years after the grant date. Awards (other than RSUs) issued under the Liberty Global 2014 Nonemployee Director Incentive Plan generally vest in three equal annual installments, provided the director continues to serve as director immediately prior to the vesting date, and expire seven years after the grant date. Commencing with awards made in 2019, the term was increased to 10 years. RSUs vest on the date of the first annual general meeting of shareholders following the grant date. These awards may be granted at or above fair value in any class of ordinary shares.

2021 Ventures Incentive Plan

In April 2021, the compensation committee of our board of directors approved a new incentive plan, referred to herein as the “**2021 Ventures Incentive Plan**”. The 2021 Ventures Incentive Plan was provided to executive officers and other key employees and is based on the performance of the Liberty Global Ventures Portfolio (the “**Portfolio**”), which is measured by assessing the fair value of the Portfolio over a three-year period that began on December 31, 2020 and ends on December 31, 2023. An initial fair value assessment was performed for the Portfolio as of December 31, 2020 by an independent third-party valuation specialist. Payout will be denominated in cash and will be assessed at the end of the three-year period using eligible participants’ initial contribution between 10% and 100% of their 2021 annual target equity value (which contributed amount is in lieu of their normal annual equity grant). The compensation committee has the discretion to settle the final payout amount in (i) cash or (ii) Liberty Global Class A and Class C ordinary shares based on the change in the Portfolio’s value. Subject to forfeitures, 100% of each participant’s payout will vest on March 31, 2024. In order to receive the payout, participants are required to remain employed through the vesting date. The 2021 Ventures Incentive Plan awards are liability classified due to the fact that the final payout under this plan will be denominated in cash and may be settled in a variable number of shares. At December 31, 2021, the estimated fair value of the final payout under the 2021 Ventures Incentive Plan was \$18.3 million.

Performance Awards

The following is a summary of the material terms and conditions with respect to our performance-based awards for certain executive officers and key employees.

2019 CEO Performance Award

In April 2019, the compensation committee of our board of directors approved the grant of RSAs and PSUs to our Chief Executive Officer (**CEO**) (the **2019 CEO Performance Award**), comprising 670,000 RSAs and 1,330,000 PSUs, each with respect to Liberty Global Class B ordinary shares. The RSAs vested on December 31, 2019, 670,000 PSUs vested on May 15, 2020, and the remaining 660,000 PSUs vested on May 15, 2021. The performance criteria for the 2019 CEO Performance Award PSUs was based on the achievement of our CEO’s performance conditions, as established by the compensation committee.

2019 Challenge Performance Awards

In March 2019, the compensation committee of our board of directors approved a challenge performance award for executive officers and certain employees (the **2019 Challenge Performance Awards**), which consists of a combination of PSARs and PSUs, in each case divided on a 1:2 ratio based on Liberty Global Class A ordinary shares and Liberty Global Class C ordinary shares. Each PSU represents the right to receive one Liberty Global Class A ordinary share or one Liberty Global Class C ordinary share, as applicable. The performance criteria for the 2019 Challenge Performance Awards is based on the participant’s performance and achievement of individual goals during the three-year period ended December 31, 2021. Subject to forfeitures, the satisfaction of performance conditions and certain other terms, 100% of each participant’s 2019 Challenge Performance Awards will vest on March 7, 2022. The PSARs have a term of ten years and base prices equal to the respective market closing prices of the applicable class on the grant date.

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Liberty Global PSUs

In April 2019, the compensation committee of our board of directors approved the grant of PSUs to executive officers and key employees (the **2019 PSUs**). The performance plan for the 2019 PSUs covered the two-year period ended December 31, 2020 and included a performance target based on the achievement of a specified compound annual growth rate (**CAGR**) in a consolidated Adjusted EBITDA metric (as defined in note 19). The performance target was adjusted for events such as acquisitions, dispositions and changes in foreign currency exchange rates that affect comparability (**Adjusted EBITDA CAGR**). The 2019 PSUs required delivery of an Adjusted EBITDA CAGR of 1.38% and included over- and under-performance payout opportunities should the Adjusted EBITDA CAGR exceed or fail to meet the target, as applicable. Participants earned 65% of their targeted awards under the 2019 PSUs, which vested 50% on each of April 1, 2021 and October 1, 2021.

During 2018, the compensation committee of our board of directors approved the grant of PSUs to executive officers and key employees (the **2018 PSUs**) pursuant to a performance plan that was based on the achievement of a specified Adjusted EBITDA CAGR during the two-year period ended December 31, 2019. Participants earned 106.1% of their targeted awards under the 2018 PSUs, which vested 50% on each of April 1, 2020 and October 1, 2020. The target Adjusted EBITDA CAGR for the 2018 PSUs was determined on October 26, 2018 and, accordingly, associated compensation expense was recognized prospectively from that date.

In February 2016, the compensation committee of our board of directors approved the grant of PSUs to executive officers and key employees (the **2016 PSUs**) pursuant to a performance plan that was based on the achievement of a specified Adjusted EBITDA CAGR during the three-year period ended December 31, 2018. The 2016 PSUs, as adjusted through the 2017 Award Modification, required delivery of an Adjusted EBITDA CAGR of 6.0% during the three-year performance period for Liberty Global or Liberty Latin America Ltd. depending on the respective class of shares underlying the award. Participants earned 82.3% of their targeted awards under the 2016 PSUs, which vested 50% on each of April 1, 2019 and October 1, 2019.

Share-based Award Activity — Liberty Global Ordinary Shares

The following tables summarize the share-based award activity during 2021 with respect to awards issued by Liberty Global. Our company settles SARs and PSARs on a net basis when exercised by the award holder, whereby the number of shares issued represents the excess value of the award based on the market price of the respective Liberty Global shares at the time of exercise relative to the award's exercise price. In addition, with respect to share-based awards held by Liberty Global employees, the number of shares to be issued upon vesting or exercise is reduced by the amount of the employee's required income tax withholding.

Options — Class A ordinary shares	Number of awards	Weighted average exercise price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2021	623,572	\$ 29.41		
Granted	48,286	27.82		
Forfeited	(29,466)	30.95		
Exercised	(46,459)	18.52		
Impact of dispositions	(15,415)	17.69		
Outstanding at December 31, 2021	580,518	\$ 30.38	4.2	\$ 0.6
Exercisable at December 31, 2021	467,288	\$ 31.66	3.1	\$ 0.3

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Options — Class C ordinary shares	Number of awards	Weighted average exercise price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2021	3,463,971	\$ 24.87		
Granted	330,019	26.31		
Forfeited	(384,214)	26.21		
Exercised	(343,147)	21.14		
Impact of dispositions	(821,877)	23.93		
Outstanding at December 31, 2021	2,244,752	\$ 25.76	5.6	\$ 8.3
Exercisable at December 31, 2021	1,419,880	\$ 27.97	4.0	\$ 3.3

SARs — Class A ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2021	19,245,884	\$ 27.29		
Granted	5,170,598	25.82		
Forfeited	(1,738,481)	30.31		
Exercised	(1,078,925)	19.94		
Impact of dispositions	(521,873)	27.66		
Outstanding at December 31, 2021	21,077,203	\$ 27.05	5.6	\$ 62.4
Exercisable at December 31, 2021	11,916,219	\$ 30.40	3.4	\$ 15.7

SARs — Class C ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2021	40,890,502	\$ 26.27		
Granted	15,719,407	25.70		
Forfeited	(3,433,326)	29.30		
Exercised	(2,520,420)	20.11		
Impact of dispositions	(1,050,350)	26.79		
Outstanding at December 31, 2021	49,605,813	\$ 26.18	5.9	\$ 167.6
Exercisable at December 31, 2021	25,906,562	\$ 29.08	3.2	\$ 46.8

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PSARs — Class A ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2021	3,723,670	\$ 25.97		
Forfeited	(255,336)	25.97		
Exercised	(13,232)	25.97		
Impact of dispositions	(102,530)	25.97		
Outstanding at December 31, 2021	3,352,572	\$ 25.97	7.2	\$ 5.9
Exercisable at December 31, 2021	14,297	\$ 25.97	7.2	\$ —

PSARs — Class C ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2021	7,447,340	\$ 25.22		
Forfeited	(510,668)	25.22		
Exercised	(26,464)	25.22		
Impact of dispositions	(205,059)	25.22		
Outstanding at December 31, 2021	6,705,149	\$ 25.22	7.2	\$ 19.3
Exercisable at December 31, 2021	28,599	\$ 25.22	7.2	\$ 0.1

RSUs — Class A ordinary shares	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term in years
Outstanding at January 1, 2021	2,443,306	\$ 17.41	
Granted	1,795,856	25.79	
Forfeited	(207,614)	20.53	
Released from restrictions	(1,343,164)	20.62	
Impact of dispositions	(62,545)	21.34	
Outstanding at December 31, 2021	2,625,839	\$ 21.16	2.2

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RSUs — Class C ordinary shares	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term in years
Outstanding at January 1, 2021	4,878,115	\$ 16.47	
Granted	3,591,710	25.64	
Forfeited	(415,081)	19.93	
Released from restrictions	(2,678,811)	19.88	
Impact of dispositions	(125,021)	20.60	
Outstanding at December 31, 2021	5,250,912	\$ 20.63	2.2
PSUs — Class A ordinary shares			
	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term in years
Outstanding at January 1, 2021	2,197,288	\$ 25.41	
Forfeited	(496,385)	25.06	
Released from restrictions	(742,856)	24.93	
Impact of dispositions	(24,536)	25.97	
Outstanding at December 31, 2021	933,511	\$ 25.97	0.2
PSUs — Class B ordinary shares			
	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term in years
Outstanding at January 1, 2021	660,000	\$ 25.29	
Released from restrictions	(660,000)	25.29	
Outstanding at December 31, 2021	—	\$ —	—
PSUs — Class C ordinary shares			
	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term in years
Outstanding at January 1, 2021	4,394,576	\$ 24.66	
Forfeited	(992,747)	24.31	
Released from restrictions	(1,485,735)	24.18	
Impact of dispositions	(49,072)	25.22	
Outstanding at December 31, 2021	1,867,022	\$ 25.22	0.2

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Share-based Award Activity — Liberty Global Ordinary Shares held by former Liberty Global employees

The following tables summarize the share-based awards held by former employees of Liberty Global subsequent to certain split-off or disposal transactions. Although we do not recognize share-based compensation expense with respect to these awards, any future exercises of SARs or vesting of RSUs and PSUs will increase the number of our outstanding ordinary shares.

	<u>Number of awards</u>	<u>Weighted average exercise or base price</u>	<u>Weighted average remaining contractual term in years</u>	<u>Aggregate intrinsic value in millions</u>
Options, SARs and PSARs:				
Class A:				
Outstanding	1,690,876	\$ 31.26	3.3	\$ 2.1
Exercisable	1,437,706	\$ 32.73	2.5	\$ 0.8
Class C:				
Outstanding	4,479,177	\$ 28.86	2.7	\$ 9.1
Exercisable	3,972,860	\$ 29.70	2.1	\$ 6.1

	<u>Number of awards</u>	<u>Weighted average grant- date fair value per share</u>	<u>Weighted average remaining contractual term in years</u>
Outstanding RSUs and PSUs:			
Class A:			
RSUs	62,558	\$ 21.34	1.9
PSUs	24,536	\$ 25.97	0.2
Class C:			
RSUs	125,046	\$ 20.60	1.9
PSUs	49,072	\$ 25.22	0.2

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(16) Defined Benefit Plans

Certain of our subsidiaries maintain various funded and unfunded defined benefit plans for their employees.

The table below provides summary information on our defined benefit plans:

	December 31,		
	2021	2020 (a)	2019
	in millions		
Fair value of plan assets (b)	\$ 1,269.9	\$ 1,196.8	\$ 1,500.0
Projected benefit obligation	\$ 1,280.5	\$ 1,302.7	\$ 1,407.5
Net asset (liability)	\$ (10.6)	\$ (105.9)	\$ 92.5

(a) Due to the held-for-sale presentation of the U.K. JV Entities at December 31, 2020, amounts exclude the defined benefit pension plans associated with such entities.

(b) The fair value of plan assets at December 31, 2021 includes \$1,184.1 million and \$85.8 million of assets that are valued based on Level 1 and Level 2 inputs, respectively, of the fair value hierarchy (as further described in note 9). Our plan assets comprise investments in debt securities, equity securities, hedge funds, insurance contracts and certain other assets.

Our net periodic pension cost was \$10.9 million, \$14.8 million and \$8.6 million during 2021, 2020 and 2019, respectively, including \$57.4 million, \$33.4 million and \$20.9 million, respectively, representing the service cost component. These amounts exclude aggregate curtailment gains of \$7.5 million, nil and \$1.4 million, respectively, which are included in impairment, restructuring and other operating items, net, in our consolidated statements of operations.

During 2021, our subsidiaries' contributions to their respective defined benefit plans aggregated \$54.7 million. Based on December 31, 2021 exchange rates and information available as of that date, we expect this amount to be \$41.8 million in 2022.

(17) Accumulated Other Comprehensive Earnings

Accumulated other comprehensive earnings included on our consolidated balance sheets and statements of equity reflect the aggregate impact of foreign currency translation adjustments and pension-related adjustments and other. The changes in the components of accumulated other comprehensive earnings, net of taxes, are summarized as follows:

	Liberty Global shareholders				Total accumulated other comprehensive earnings
	Foreign currency translation adjustments	Pension-related adjustments and other	Accumulated other comprehensive earnings	Noncontrolling interests	
	in millions				
Balance at January 1, 2019	\$ 719.3	\$ (87.5)	\$ 631.8	\$ (4.0)	\$ 627.8
Other comprehensive earnings	490.3	(9.4)	480.9	1.2	482.1
Balance at December 31, 2019	1,209.6	(96.9)	1,112.7	(2.8)	1,109.9
Other comprehensive earnings	2,599.7	(19.3)	2,580.4	0.6	2,581.0
Balance at December 31, 2020	3,809.3	(116.2)	3,693.1	(2.2)	3,690.9
Other comprehensive earnings	70.7	128.4	199.1	1.2	200.3
Balance at December 31, 2021	\$ 3,880.0	\$ 12.2	\$ 3,892.2	\$ (1.0)	\$ 3,891.2

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The components of other comprehensive earnings, net of taxes, are reflected in our consolidated statements of comprehensive earnings. The following table summarizes the tax effects related to each component of other comprehensive earnings, net of amounts reclassified to our consolidated statements of operations:

	<u>Pre-tax amount</u>	<u>Tax benefit (expense)</u>	<u>Net-of-tax amount</u>
	in millions		
Year ended December 31, 2021:			
Foreign currency translation adjustments (a)	\$ 129.4	\$ 1.2	\$ 130.6
Pension-related adjustments and other	<u>139.9</u>	<u>(10.3)</u>	<u>129.6</u>
Other comprehensive earnings from continuing operations	269.3	(9.1)	260.2
Other comprehensive loss from discontinued operations	<u>(59.9)</u>	<u>—</u>	<u>(59.9)</u>
Other comprehensive earnings	209.4	(9.1)	200.3
Other comprehensive earnings attributable to noncontrolling interests (b)	<u>(1.6)</u>	<u>0.4</u>	<u>(1.2)</u>
Other comprehensive earnings attributable to Liberty Global shareholders	<u>\$ 207.8</u>	<u>\$ (8.7)</u>	<u>\$ 199.1</u>
Year ended December 31, 2020:			
Foreign currency translation adjustments	\$ 2,586.4	\$ (0.2)	\$ 2,586.2
Pension-related adjustments and other	<u>(22.5)</u>	<u>3.8</u>	<u>(18.7)</u>
Other comprehensive earnings from continuing operations	2,563.9	3.6	2,567.5
Other comprehensive earnings from discontinued operations	13.5	—	13.5
Other comprehensive earnings	<u>2,577.4</u>	<u>3.6</u>	<u>2,581.0</u>
Other comprehensive earnings attributable to noncontrolling interests (b)	<u>(0.9)</u>	<u>0.3</u>	<u>(0.6)</u>
Other comprehensive earnings attributable to Liberty Global shareholders	<u>\$ 2,576.5</u>	<u>\$ 3.9</u>	<u>\$ 2,580.4</u>
Year ended December 31, 2019:			
Foreign currency translation adjustments	\$ 441.7	\$ 3.3	\$ 445.0
Pension-related adjustments and other	<u>(16.7)</u>	<u>2.3</u>	<u>(14.4)</u>
Other comprehensive earnings from continuing operations	425.0	5.6	430.6
Other comprehensive earnings from discontinued operations (a)	<u>51.6</u>	<u>(0.1)</u>	<u>51.5</u>
Other comprehensive earnings	476.6	5.5	482.1
Other comprehensive earnings attributable to noncontrolling interests (b)	<u>(1.5)</u>	<u>0.3</u>	<u>(1.2)</u>
Other comprehensive earnings attributable to Liberty Global shareholders	<u>\$ 475.1</u>	<u>\$ 5.8</u>	<u>\$ 480.9</u>

(a) For additional information regarding the reclassification of foreign currency translation adjustments included in net earnings (loss), see note 6.

(b) Amounts represent the noncontrolling interest owners' share of our pension-related adjustments.

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(18) Commitments and Contingencies

Commitments

In the normal course of business, we enter into agreements that commit our company to make cash payments in future periods with respect to network and connectivity commitments, purchases of customer premises and other equipment and services, programming contracts and other items. The following table sets forth the U.S. dollar equivalents of such commitments as of December 31, 2021. The commitments included in this table do not reflect any liabilities that are included on our December 31, 2021 consolidated balance sheet.

	Payments due during:						Total
	2022	2023	2024	2025	2026	Thereafter	
	in millions						
Network and connectivity commitments	\$ 186.9	\$ 136.8	\$ 96.6	\$ 90.6	\$ 39.9	\$ 670.3	\$ 1,221.1
Purchase commitments	508.1	89.9	33.7	22.1	23.3	0.7	677.8
Programming commitments	186.3	144.9	120.4	71.6	47.4	18.8	589.4
Other commitments	76.7	55.9	29.4	29.9	29.8	126.0	347.7
Total	<u>\$ 958.0</u>	<u>\$ 427.5</u>	<u>\$ 280.1</u>	<u>\$ 214.2</u>	<u>\$ 140.4</u>	<u>\$ 815.8</u>	<u>\$ 2,836.0</u>

Network and connectivity commitments primarily include Telenet's commitments for certain operating costs associated with its leased network. Telenet's commitments for certain operating costs are subject to adjustment based on changes in the network operating costs incurred by Telenet with respect to its own networks. These potential adjustments are not subject to reasonable estimation and, therefore, are not included in the above table.

Purchase commitments include unconditional and legally binding obligations related to (i) the purchase of customer premises, network and other equipment and (ii) certain service-related commitments, including call center, information technology and maintenance services.

Programming commitments consist of obligations associated with certain of our programming, studio output and sports rights contracts that are enforceable and legally binding on us as we have agreed to pay minimum fees without regard to (i) the actual number of subscribers to the programming services, (ii) whether we terminate service to a portion of our subscribers or dispose of a portion of our distribution systems or (iii) whether we discontinue our premium sports services. Programming commitments do not include increases in future periods associated with contractual inflation or other price adjustments that are not fixed. Accordingly, the amounts reflected in the above table with respect to these contracts are significantly less than the amounts we expect to pay in these periods under these contracts. Historically, payments to programming vendors have represented a significant portion of our operating costs, and we expect this will continue to be the case in future periods. In this regard, our total programming and copyright costs (including amounts related to the U.K. JV Entities through the closing of the U.K. JV Transaction) aggregated \$1,123.2 million, \$1,629.3 million and \$1,612.5 million during 2021, 2020 and 2019, respectively.

In addition to the commitments set forth in the table above, we have significant commitments under (i) derivative instruments and (ii) defined benefit plans and similar agreements, pursuant to which we expect to make payments in future periods. For information regarding our derivative instruments, including the net cash paid or received in connection with these instruments during 2021, 2020 and 2019, see note 8. For information regarding our defined benefit plans, see note 16.

We also have commitments pursuant to agreements with, and obligations imposed by, franchise authorities and municipalities, which may include obligations in certain markets to move aerial cable to underground ducts or to upgrade, rebuild or extend portions of our broadband communication systems. Such amounts are not included in the above table because they are not fixed or determinable.

We have established various defined contribution benefit plans for our and our subsidiaries' employees. Our aggregate expense for matching contributions under the various defined contribution employee benefit plans (including amounts related to

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the U.K. JV Entities through the closing of the U.K. JV Transaction) was \$30.1 million, \$44.8 million and \$42.6 million during 2021, 2020 and 2019, respectively.

Guarantees and Other Credit Enhancements

In the ordinary course of business, we may provide (i) indemnifications to our lenders, our vendors and certain other parties and (ii) performance and/or financial guarantees to local municipalities, our customers and vendors. Historically, these arrangements have not resulted in our company making any material payments and we do not believe that they will result in material payments in the future.

Legal and Regulatory Proceedings and Other Contingencies

Interkabel Acquisition. On November 26, 2007, Telenet and four associations of municipalities in Belgium, which we refer to as the pure intercommunales or the “PICs,” announced a non-binding agreement-in-principle to transfer the analog and digital television activities of the PICs, including all existing subscribers, to Telenet. Subsequently, Telenet and the PICs entered into a binding agreement (the **2008 PICs Agreement**), which closed effective October 1, 2008. Beginning in December 2007, Proximus NV/SA (**Proximus**), the incumbent telecommunications operator in Belgium, instituted several proceedings seeking to block implementation of these agreements. Proximus lodged summary proceedings with the President of the Court of First Instance of Antwerp to obtain a provisional injunction preventing the PICs from effecting the agreement-in-principle and initiated a civil procedure on the merits claiming the annulment of the agreement-in-principle. In March 2008, the President of the Court of First Instance of Antwerp ruled in favor of Proximus in the summary proceedings, which ruling was overturned by the Court of Appeal of Antwerp in June 2008. Proximus brought an appeal judgment before the Belgian Supreme Court, which confirmed the appeal judgment in September 2010. On April 6, 2009, the Court of First Instance of Antwerp ruled in favor of the PICs and Telenet in the civil procedure on the merits, dismissing Proximus’ request for the rescission of the agreement-in-principle and the 2008 PICs Agreement. On June 12, 2009, Proximus appealed this judgment to the Court of Appeal of Antwerp. In this appeal, Proximus also sought compensation for damages. While these proceedings were suspended indefinitely, other proceedings were initiated, which resulted in a ruling by the Belgian Council of State in May 2014 annulling (i) the decision of the PICs not to organize a public market consultation and (ii) the decision from the PICs’ board of directors to approve the 2008 PICs Agreement. In December 2015, Proximus resumed the civil proceedings pending with the Court of Appeal of Antwerp seeking to have the 2008 PICs Agreement annulled and claiming damages of €1.4 billion (\$1.6 billion). On December 18, 2017, the Court of Appeal of Antwerp rejected Proximus’ claim in its entirety. On June 28, 2019, Proximus brought this appeal judgment before the Belgian Supreme Court. On January 22, 2021, the Belgian Supreme Court partially annulled the judgment of the Court of Appeal of Antwerp. The case was referred to the Court of Appeal of Brussels and is currently pending with this Court which will need to make a new decision on the matter within the boundaries of the annulment by the Belgian Supreme Court. It is likely that it will take the Court of Appeal of Brussels several years to decide on the matter.

No assurance can be given as to the outcome of these or other proceedings. However, an unfavorable outcome of existing or future proceedings could potentially lead to the annulment of the 2008 PICs Agreement. We do not expect the ultimate resolution of this matter to have a material impact on our results of operations, cash flows or financial position. No amounts have been accrued by us with respect to this matter as the likelihood of loss is not considered to be probable.

Telekom Deutschland Litigation. On December 28, 2012, Unitymedia filed a lawsuit against Telekom Deutschland GmbH (**Telekom Deutschland**) in which Unitymedia asserted that it pays excessive prices for the co-use of Telekom Deutschland’s cable ducts in Unitymedia’s footprint. The Federal Network Agency approved rates for the co-use of certain ducts of Telekom Deutschland in March 2011. Based in part on these approved rates, Unitymedia sought a reduction of the annual lease fees by approximately five-sixths. In addition, Unitymedia sought the return of similarly calculated overpayments from 2009 through the ultimate settlement date, plus accrued interest. In October 2016, the first instance court dismissed this action, and in March 2018, the court of appeal dismissed Unitymedia’s appeal of the first instance court’s decision and did not grant permission to appeal further to the Federal Court of Justice. Unitymedia has filed a motion with the Federal Court of Justice to grant permission to appeal. The resolution of this matter may take several years and no assurance can be given that Unitymedia’s claims will be successful. In connection with our sale of the Vodafone Disposal Group in 2019, we will only share in 50% of any amounts recovered, plus 50% of the net present value of certain cost savings in future periods that are attributable to the favorable resolution of this matter, less 50% of associated legal or other third-party fees paid post-completion of the sale of the Vodafone Disposal Group. Any amount we may recover related to this matter will not be reflected in our consolidated financial statements until such time as the final disposition of this matter has been reached.

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Belgium Regulatory Developments. In June 2018, the Belgisch Instituut voor Post en Telecommunicatie and the regional regulators for the media sectors (together, the **Belgium Regulatory Authorities**) adopted a new decision finding that Telenet has significant market power in the wholesale broadband market (the **2018 Decision**). The 2018 Decision imposes on Telenet the obligations to (i) provide third-party operators with access to the digital television platform (including basic digital video and analog video) and (ii) make available to third-party operators a bitstream offer of broadband internet access (including fixed-line telephony as an option). Unlike prior decisions, the 2018 Decision no longer applies “retail minus” pricing on Telenet; however, as of August 1, 2018, this decision imposed a 17% interim price reduction in monthly wholesale cable access prices. On July 5, 2019, the Belgium Regulatory Authorities published for consultation a draft decision regarding “reasonable access tariffs” that would replace the interim prices. On May 26, 2020, the Belgium Regulatory Authorities adopted a final decision regarding the “reasonable access tariffs” (the **2020 Decision**) that represents, for example, a decrease of 11.5% as compared to the interim rates for a 100 Mbps offer combined with TV. These rates are expected to evolve over time due to, among other reasons, broadband capacity usage. The 2020 Decision became effective on July 1, 2020.

The 2020 Decision aims to, and in its application may, strengthen Telenet’s competitors by granting them resale access to Telenet’s network to offer competing products and services notwithstanding Telenet’s substantial historical financial outlays in developing the infrastructure. In addition, any resale access granted to competitors could (i) limit the bandwidth available to Telenet to provide new or expanded products and services to the customers served by its network and (ii) adversely impact Telenet’s ability to maintain or increase its revenue and cash flows. The extent of any such adverse impacts ultimately will be dependent on the extent that competitors take advantage of the resale access afforded to Telenet’s network, the rates that Telenet receives for such access and other competitive factors or market developments. Telenet considers the 2018 Decision to be inconsistent with the principle of technology-neutral regulation and the European Single Market Strategy to stimulate further investments in broadband networks. Telenet challenged the 2018 Decision in the Court of Appeal of Brussels and also initiated an action in the European Court of Justice against the European Commission’s decision not to challenge the 2018 Decision. The proceedings before the European Court of Justice have been withdrawn by Telenet in order to avoid undue delays in the Court of Appeal case. In a decision issued on September 4, 2019, the Court of Appeal of Brussels upheld the 2018 Decision.

UPC Austria Matter. On July 31 2018, we completed the sale of our Austrian operations, “**UPC Austria**,” to Deutsche Telekom AG (**Deutsche Telekom**). In October 2019, we received notification under the terms of the relevant acquisition agreements from Deutsche Telekom and its subsidiary, **T-Mobile Austria Holding GmbH**, (together, the **UPC Austria Sale Counterparties**), asserting claims of €70.5 million (\$80.3 million). The value of the amounts claimed by the UPC Austria Sale Counterparties has since increased to €106.2 million (\$120.9 million), plus interest. No amounts have been accrued by our company with respect to this matter as the likelihood of loss is not considered to be probable at this stage. We are unable to provide any meaningful estimate of a possible range of loss because, among other reasons, (i) we believe the assertions are unsupported and/or exaggerated and (ii) there are significant factual matters to be resolved. We intend to vigorously defend this matter.

Other Contingency Matters. In connection with the dispositions of certain of our operations, we provided tax indemnities to the counterparties for certain tax liabilities that could arise from the period we owned the respective operations, subject to certain thresholds. While we have not received notification from the counterparties for indemnification, it is reasonably possible that we could, and the amounts involved could be significant. No amounts have been accrued by our company as the likelihood of any loss is not considered to be probable. Further, Liberty Global may be entitled to certain amounts that our disposed operations may recover from taxing authorities. Any such amounts will not be reflected in our consolidated financial statements until such time as the final disposition of such matters has been reached.

Other Regulatory Matters. Video distribution, broadband internet, fixed-line telephony, mobile and content businesses are regulated in each of the countries in which we or our affiliates operate. The scope of regulation varies from country to country, although in some significant respects regulation in European markets is harmonized under the regulatory structure of the European Union (E.U.). Adverse regulatory developments could subject our businesses to a number of risks. Regulation, including conditions imposed on us by competition or other authorities as a requirement to close acquisitions or dispositions, could limit growth, revenue and the number and types of services offered and could lead to increased operating costs and property and equipment additions. Regulation may also restrict our operations and subject them to further competitive pressure, including pricing restrictions, interconnect and other access obligations and restrictions or controls on content, including content provided by third parties. Failure to comply with current or future regulation could expose our businesses to various penalties.

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In addition to the foregoing items, we have contingent liabilities related to matters arising in the ordinary course of business, including (i) legal proceedings, (ii) issues involving VAT and wage, property, withholding and other tax issues and (iii) disputes over interconnection, programming, copyright and channel carriage fees. While we generally expect that the amounts required to satisfy these contingencies will not materially differ from any estimated amounts we have accrued, no assurance can be given that the resolution of one or more of these contingencies will not result in a material impact on our results of operations, cash flows or financial position in any given period. Due, in general, to the complexity of the issues involved and, in certain cases, the lack of a clear basis for predicting outcomes, we cannot provide a meaningful range of potential losses or cash outflows that might result from any unfavorable outcomes.

(19) Segment Reporting

We generally identify our reportable segments as (i) those consolidated subsidiaries that represent 10% or more of our revenue, Adjusted EBITDA (as defined below) or total assets or (ii) those equity method affiliates where our investment or share of revenue or Adjusted EBITDA represents 10% or more of our total assets, revenue or Adjusted EBITDA, respectively. In certain cases, we may elect to include an operating segment in our segment disclosure that does not meet the above-described criteria for a reportable segment. We evaluate performance and make decisions about allocating resources to our operating segments based on financial measures such as revenue and Adjusted EBITDA. In addition, we review non-financial measures such as customer growth, as appropriate.

Adjusted EBITDA is the primary measure used by our chief operating decision maker to evaluate segment operating performance and is also a key factor that is used by our internal decision makers to (i) determine how to allocate resources to segments and (ii) evaluate the effectiveness of our management for purposes of annual and other incentive compensation plans. As we use the term, “**Adjusted EBITDA**” is defined as earnings (loss) from continuing operations before net income tax benefit (expense), other non-operating income or expenses, net share of results of affiliates, net gains (losses) on extinguishment of debt, net realized and unrealized gains (losses) due to changes in fair values of certain investments and debt, net foreign currency gains (losses), net gains (losses) on derivative instruments, net interest expense, depreciation and amortization, share-based compensation, provisions and provision releases related to significant litigation and impairment, restructuring and other operating items. Other operating items include (a) gains and losses on the disposition of long-lived assets, (b) third-party costs directly associated with successful and unsuccessful acquisitions and dispositions, including legal, advisory and due diligence fees, as applicable, and (c) other acquisition-related items, such as gains and losses on the settlement of contingent consideration. Our internal decision makers believe Adjusted EBITDA is a meaningful measure because it represents a transparent view of our recurring operating performance that is unaffected by our capital structure and allows management to (1) readily view operating trends, (2) perform analytical comparisons and benchmarking between segments and (3) identify strategies to improve operating performance in the different countries in which we operate. A reconciliation of earnings or loss from continuing operations to Adjusted EBITDA is presented below.

As of December 31, 2021, our reportable segments are as follows:

Consolidated:

- Switzerland
- Belgium
- Ireland

Nonconsolidated:

- VMO2 JV
- VodafoneZiggo JV

On September 22, 2021, we entered into an agreement to sell our operations in Poland (see note 6). Accordingly, segment information for all periods has been retrospectively revised to present our operating segment in Poland as a discontinued operation. Previously, our operations in Poland, together with our operations in Slovakia, were included in our former “*Central and Eastern Europe*” reportable segment. As a result of this change, our operations in Slovakia are now included in Central and Other (as defined below and previously referred to as “*Central and Corporate*”) for all periods presented.

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On June 1, 2021, we completed the U.K. JV Transaction, whereby we contributed the U.K. JV Entities to the VMO2 JV. Prior to the completion of the U.K. JV Transaction, we presented the U.K. JV Entities, together with our operations in Ireland, as a single reportable segment, “U.K./Ireland”. In connection with the completion of the U.K. JV Transaction, we have restated our segment presentation for all periods to separately present (i) the U.K. JV Entities and (ii) Ireland. In addition, certain other less significant entities previously included in the U.K./Ireland segment are now included within Central and Other (as defined below). Following the closing of the U.K. JV Transaction, we have identified the VMO2 JV as a nonconsolidated reportable segment. For additional information regarding the U.K. JV Transaction, see note 6.

All of our reportable segments derive their revenue primarily from residential and B2B communications services, including broadband internet, video, fixed-line telephony and mobile services.

Our “**Central and Other**” category primarily includes (i) our operations in Slovakia, (ii) services provided to the VMO2 JV, the VodafoneZiggo JV and various third parties related to transitional service agreements, (iii) sales of customer premises equipment to the VodafoneZiggo JV and (iv) certain centralized functions, including billing systems, network operations, technology, marketing, facilities, finance and other administrative functions.

We present only the reportable segments of our continuing operations in the tables below.

Performance Measures of Our Reportable Segments

The amounts presented below represent 100% of each of our reportable segment’s revenue and Adjusted EBITDA. As we have the ability to control Telenet, we consolidate 100% of Telenet’s revenue and expenses in our consolidated statements of operations despite the fact that third parties own a significant interest. The noncontrolling owners’ interests in the operating results of Telenet and other less significant majority-owned subsidiaries are reflected in net earnings or loss attributable to noncontrolling interests in our consolidated statements of operations. Similarly, despite only holding a 50% noncontrolling interest in both the VMO2 JV and the VodafoneZiggo JV, we present 100% of the revenue and Adjusted EBITDA of those entities in the tables below. Our share of the operating results of the VMO2 JV and the VodafoneZiggo JV are included in share of results of affiliates, net, in our consolidated statements of operations.

	Year ended December 31,					
	2021		2020		2019	
	Revenue	Adjusted EBITDA	Revenue	Adjusted EBITDA	Revenue	Adjusted EBITDA
	in millions					
Switzerland	\$ 3,321.9	\$ 1,208.7	\$ 1,573.8	\$ 693.8	\$ 1,258.8	\$ 627.9
Belgium	3,065.9	1,481.8	2,940.9	1,413.4	2,893.0	1,386.1
U.K. (a)	2,736.4	1,085.3	6,076.9	2,453.5	6,086.3	2,608.4
Ireland	550.0	218.6	513.7	202.0	516.2	192.2
Central and Other	648.7	(33.1)	461.9	(61.4)	366.1	(149.0)
Intersegment eliminations (b)	(11.6)	1.8	(21.8)	2.2	(4.6)	1.8
Total	\$ 10,311.3	\$ 3,963.1	\$ 11,545.4	\$ 4,703.5	\$ 11,115.8	\$ 4,667.4
VMO2 JV (c)	\$ 8,522.9	\$ 2,716.6	\$ —	\$ —	\$ —	\$ —
VodafoneZiggo JV	\$ 4,824.2	\$ 2,265.6	\$ 4,565.4	\$ 2,142.0	\$ 4,407.8	\$ 1,987.7

(a) Amounts represent the revenue and Adjusted EBITDA of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.

(b) Amounts relate to transactions between our continuing and discontinued operations.

(c) The 2021 amounts represent the revenue and Adjusted EBITDA of the VMO2 JV for the period beginning June 1, 2021.

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The following table provides a reconciliation of earnings (loss) from continuing operations to Adjusted EBITDA:

	Year ended December 31,		
	2021	2020	2019
	in millions		
Earnings (loss) from continuing operations	\$ 13,527.5	\$ (1,525.1)	\$ (1,475.9)
Income tax expense (benefit)	473.3	(275.9)	234.0
Other income, net	(44.9)	(76.2)	(114.4)
Gain on Atlas Edge JV Transactions	(227.5)	—	—
Gain on U.K. JV Transaction	(10,873.8)	—	—
Share of results of affiliates, net	175.4	245.3	198.5
Losses on debt extinguishment, net	90.6	233.2	216.7
Realized and unrealized gains due to changes in fair values of certain investments and debt, net	(735.0)	(45.2)	(72.0)
Foreign currency transaction losses (gains), net	(1,324.5)	1,409.3	95.6
Realized and unrealized losses (gains) on derivative instruments, net	(622.9)	878.7	193.2
Interest expense	882.1	1,186.8	1,384.2
Operating income	1,320.3	2,030.9	659.9
Impairment, restructuring and other operating items, net	(19.0)	97.4	155.4
Depreciation and amortization	2,353.7	2,227.2	3,546.3
Share-based compensation expense	308.1	348.0	305.8
Adjusted EBITDA	\$ 3,963.1	\$ 4,703.5	\$ 4,667.4

Balance Sheet Data of our Reportable Segments

Selected balance sheet data of our reportable segments is set forth below:

	Long-lived assets		Total assets	
	December 31,		December 31,	
	2021	2020	2021	2020
	in millions			
Switzerland	\$ 11,533.8	\$ 12,258.8	\$ 13,812.9	\$ 14,659.9
Belgium	5,652.3	6,221.7	6,885.7	7,571.1
U.K.	—	—	—	20,673.2
Ireland	775.3	817.3	894.8	970.6
Central and Other	889.1	1,177.4	25,323.6	15,217.9
Total	\$ 18,850.5	\$ 20,475.2	\$ 46,917.0	\$ 59,092.7
VMO2 JV	\$ 51,639.5	\$ —	\$ 60,181.8	\$ —
VodafoneZiggo JV	\$ 19,651.2	\$ 21,808.3	\$ 21,288.5	\$ 23,630.8

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Property and Equipment Additions of our Reportable Segments

The property and equipment additions of our reportable segments (including capital additions financed under capital-related vendor financing or finance lease arrangements) are presented below and reconciled to the capital expenditure amounts included in our consolidated statements of cash flows. For additional information concerning capital additions financed under vendor financing and finance lease arrangements, see notes 10 and 12, respectively.

	Year ended December 31,		
	2021	2020	2019
	in millions		
Switzerland	\$ 609.9	\$ 302.8	\$ 277.9
Belgium	573.5	513.6	537.2
U.K. (a)	557.4	1,347.2	1,493.0
Ireland	94.4	85.6	85.0
Central and Other (b)	334.3	354.4	392.3
Total property and equipment additions	2,169.5	2,603.6	2,785.4
Assets acquired under capital-related vendor financing arrangements	(661.1)	(1,339.6)	(1,710.7)
Assets acquired under finance leases	(42.6)	(48.7)	(66.4)
Changes in current liabilities related to capital expenditures	(57.8)	77.5	159.9
Total capital expenditures, net	\$ 1,408.0	\$ 1,292.8	\$ 1,168.2
Property and equipment additions:			
VMO2 JV (c)	\$ 1,706.4	\$ —	\$ —
VodafoneZiggo JV	\$ 990.5	\$ 918.7	\$ 887.9

- (a) Represents the property and equipment additions of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.
- (b) Includes (i) property and equipment additions representing centrally-owned assets that benefit our operating segments, (ii) the net impact of certain centrally-procured network equipment that is ultimately transferred to our operating segments and (iii) property and equipment additions of our operations in Slovakia.
- (c) The 2021 amount represents the property and equipment additions of the VMO2 JV for the period beginning June 1, 2021.

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Revenue by Major Category

Our revenue by major category for our consolidated reportable segments is set forth below:

	Year ended December 31,		
	2021	2020	2019
	<i>in millions</i>		
Residential revenue:			
Residential fixed revenue (a):			
Subscription revenue (b):			
Broadband internet	\$ 2,371.7	\$ 3,181.9	\$ 3,098.2
Video	1,831.8	2,446.2	2,460.3
Fixed-line telephony	841.1	1,328.2	1,396.6
Total subscription revenue	5,044.6	6,956.3	6,955.1
Non-subscription revenue	161.2	217.3	194.5
Total residential fixed revenue	5,205.8	7,173.6	7,149.6
Residential mobile revenue (c):			
Subscription revenue (b)	1,630.7	1,090.3	931.9
Non-subscription revenue	760.8	691.5	688.1
Total residential mobile revenue	2,391.5	1,781.8	1,620.0
Total residential revenue	7,597.3	8,955.4	8,769.6
B2B revenue (d):			
Subscription revenue	619.0	563.9	476.7
Non-subscription revenue	1,243.8	1,431.5	1,384.8
Total B2B revenue	1,862.8	1,995.4	1,861.5
Other revenue (e)	851.2	594.6	484.7
Total	\$ 10,311.3	\$ 11,545.4	\$ 11,115.8

- (a) Residential fixed subscription revenue includes amounts received from subscribers for ongoing services and the recognition of deferred installation revenue over the associated contract period. Residential fixed non-subscription revenue includes, among other items, channel carriage fees, late fees and revenue from the sale of equipment.
- (b) Residential subscription revenue from subscribers who purchase bundled services at a discounted rate is generally allocated proportionally to each service based on the standalone price for each individual service. As a result, changes in the standalone pricing of our fixed and mobile products or the composition of bundles can contribute to changes in our product revenue categories from period to period.
- (c) Residential mobile subscription revenue includes amounts received from subscribers for ongoing services. Residential mobile non-subscription revenue includes, among other items, interconnect revenue and revenue from sales of mobile handsets and other devices.
- (d) B2B subscription revenue represents revenue from (i) services provided to certain small or home office (SOHO) subscribers and (ii) mobile services provided to medium and large enterprises. SOHO subscribers pay a premium price to receive expanded service levels along with broadband internet, video, fixed-line telephony or mobile services that are the same or similar to the mass marketed products offered to our residential subscribers. B2B non-subscription revenue includes (a) revenue from business broadband internet, video, fixed-line telephony and data services offered to medium and large enterprises and, on a wholesale basis, to other operators and (b) revenue from long-term leases of portions of our network.

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- (e) Other revenue includes, among other items, (i) revenue earned from the VMO2 JV Services, the NL JV Services and the sale of customer premises equipment to the VodafoneZiggo JV, (ii) broadcasting revenue in Belgium and Ireland and (iii) revenue earned from transitional and other services provided to various third parties.

Geographic Segments

The revenue of our geographic segments is set forth below:

	Year ended December 31,		
	2021	2020	2019
	in millions		
Switzerland	\$ 3,321.9	\$ 1,573.8	\$ 1,258.8
Belgium	3,065.9	2,940.9	2,893.0
U.K. (a)	2,736.4	6,076.9	6,086.3
Ireland	550.0	513.7	516.2
Slovakia	52.3	50.7	49.7
Other, including intersegment eliminations (b)	584.8	389.4	311.8
Total	\$ 10,311.3	\$ 11,545.4	\$ 11,115.8
VMO2 JV (U.K.) (c)	\$ 8,522.9	\$ —	\$ —
VodafoneZiggo JV (the Netherlands)	\$ 4,824.2	\$ 4,565.4	\$ 4,407.8

(a) Represents the revenue of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.

(b) Primarily relates to revenue associated with our Central functions, most of which is located in the Netherlands and the U.K.

(c) The 2021 amount represents the revenue of the VMO2 JV for the period beginning June 1, 2021.

The long-lived assets of our geographic segments are set forth below:

	December 31,	
	2021	2020
	in millions	
Switzerland	\$ 11,533.8	\$ 12,258.8
Belgium	5,652.3	6,221.7
Ireland	775.3	817.3
Slovakia	123.5	135.5
Other (a)	765.6	1,041.9
Total	\$ 18,850.5	\$ 20,475.2
VMO2 JV (U.K.)	\$ 51,639.5	\$ —
VodafoneZiggo JV (the Netherlands)	\$ 19,651.2	\$ 21,808.3

(a) Primarily relates to certain long-lived assets associated with our Central functions located in the Netherlands, the U.K. and the U.S.

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(20) Quarterly Financial Information (Unaudited)

	2021			
	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter
	in millions, except per share amounts			
Revenue:				
As previously reported	\$ 3,615.3	\$ 3,105.5	\$ 1,901.4	\$ 1,920.8
Effect of discontinued operations (note 6)	(115.4)	(116.3)	—	—
As adjusted	<u>\$ 3,499.9</u>	<u>\$ 2,989.2</u>	<u>\$ 1,901.4</u>	<u>\$ 1,920.8</u>
Operating income:				
As previously reported	\$ 625.3	\$ 565.5	\$ 101.0	\$ 80.9
Effect of discontinued operations (note 6)	(24.1)	(28.3)	—	—
As adjusted	<u>\$ 601.2</u>	<u>\$ 537.2</u>	<u>\$ 101.0</u>	<u>\$ 80.9</u>
Earnings from continuing operations:				
As previously reported	\$ 1,440.3	\$ 11,174.5	\$ 315.6	\$ 638.3
Effect of discontinued operations (note 6)	(17.6)	(23.6)	—	—
As adjusted	<u>\$ 1,422.7</u>	<u>\$ 11,150.9</u>	<u>\$ 315.6</u>	<u>\$ 638.3</u>
Earnings from continuing operations attributable to Liberty Global shareholders:				
As previously reported	\$ 1,385.4	\$ 11,128.2	\$ 274.0	\$ 597.8
Effect of discontinued operations (note 6)	(17.6)	(23.6)	—	—
As adjusted	<u>\$ 1,367.8</u>	<u>\$ 11,104.6</u>	<u>\$ 274.0</u>	<u>\$ 597.8</u>
Net earnings	<u>\$ 1,440.3</u>	<u>\$ 11,174.5</u>	<u>\$ 318.7</u>	<u>\$ 676.6</u>
Net earnings attributable to Liberty Global shareholders	<u>\$ 1,385.4</u>	<u>\$ 11,128.2</u>	<u>\$ 277.1</u>	<u>\$ 636.1</u>
Basic earnings attributable to Liberty Global shareholders per share (note 3):				
Continuing operations	\$ 2.38	\$ 19.94	\$ 0.49	\$ 1.11
Discontinued operations	0.03	0.04	0.01	0.07
	<u>\$ 2.41</u>	<u>\$ 19.98</u>	<u>\$ 0.50</u>	<u>\$ 1.18</u>
Diluted earnings attributable to Liberty Global shareholders per share (note 3):				
Continuing operations	\$ 2.34	\$ 19.51	\$ 0.48	\$ 1.08
Discontinued operations	0.03	0.04	0.01	0.07
	<u>\$ 2.37</u>	<u>\$ 19.55</u>	<u>\$ 0.49</u>	<u>\$ 1.15</u>

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	2020			
	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter
	in millions, except per share amounts			
Revenue:				
As previously reported	\$ 2,875.8	\$ 2,722.9	\$ 2,954.5	\$ 3,426.9
Effect of discontinued operations (note 6)	(106.7)	(103.7)	(109.1)	(115.2)
As adjusted	<u>\$ 2,769.1</u>	<u>\$ 2,619.2</u>	<u>\$ 2,845.4</u>	<u>\$ 3,311.7</u>
Operating income:				
As previously reported	\$ 280.6	\$ 526.8	\$ 662.1	\$ 648.2
Effect of discontinued operations (note 6)	(22.6)	(22.5)	(18.3)	(23.4)
As adjusted	<u>\$ 258.0</u>	<u>\$ 504.3</u>	<u>\$ 643.8</u>	<u>\$ 624.8</u>
Earnings (loss) from continuing operations:				
As previously reported	\$ 1,017.7	\$ (503.8)	\$ (973.6)	\$ (1,007.0)
Effect of discontinued operations (note 6)	(10.8)	(19.7)	(12.0)	(15.9)
As adjusted	<u>\$ 1,006.9</u>	<u>\$ (523.5)</u>	<u>\$ (985.6)</u>	<u>\$ (1,022.9)</u>
Earnings (loss) from continuing operations attributable to Liberty Global shareholders:				
As previously reported	\$ 949.8	\$ (524.2)	\$ (1,023.1)	\$ (1,030.5)
Effect of discontinued operations (note 6)	(10.8)	(19.7)	(12.0)	(15.9)
As adjusted	<u>\$ 939.0</u>	<u>\$ (543.9)</u>	<u>\$ (1,035.1)</u>	<u>\$ (1,046.4)</u>
Net earnings (loss)	<u>\$ 1,017.7</u>	<u>\$ (503.8)</u>	<u>\$ (973.6)</u>	<u>\$ (1,007.0)</u>
Net earnings (loss) attributable to Liberty Global shareholders	<u>\$ 949.8</u>	<u>\$ (524.2)</u>	<u>\$ (1,023.1)</u>	<u>\$ (1,030.5)</u>
Basic earnings (loss) attributable to Liberty Global shareholders per share (note 3):				
Continuing operations	\$ 1.49	\$ (0.89)	\$ (1.75)	\$ (1.80)
Discontinued operations	0.02	0.03	0.02	0.03
	<u>\$ 1.51</u>	<u>\$ (0.86)</u>	<u>\$ (1.73)</u>	<u>\$ (1.77)</u>
Diluted earnings (loss) attributable to Liberty Global shareholders per share (note 3):				
Continuing operations	\$ 1.48	\$ (0.89)	\$ (1.75)	\$ (1.80)
Discontinued operations	0.02	0.03	0.02	0.03
	<u>\$ 1.50</u>	<u>\$ (0.86)</u>	<u>\$ (1.73)</u>	<u>\$ (1.77)</u>

PART III

The capitalized terms used in Part III of this Annual Report on Form 10-K are defined in the notes to our consolidated financial statements. In the following text, the terms, “we,” “our,” “our company” and “us” may refer, as the context requires, to Liberty Global or collectively to Liberty Global and its subsidiaries.

Except as indicated below, the following required information is incorporated by reference to our definitive proxy statement for our 2022 Annual Meeting of Shareholders, which we intend to hold during the second quarter of 2022.

Item 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Item 11. EXECUTIVE COMPENSATION

Item 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by Item 201(d) of Regulation S-K is included below and accordingly will not be incorporated by reference to our definitive proxy statement.

Item 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

Item 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

Our independent registered public accounting firm is KPMG LLP, Denver, CO
Auditor Firm ID: 185

We intend to file our definitive proxy statement for our 2022 Annual Meeting of Shareholders with the Securities and Exchange Commission on or before May 2, 2022.

Item 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED SHAREHOLDER MATTERS

Securities Authorized for Issuance Under Equity Compensation Plans

The following table sets forth information as of December 31, 2021 with respect to our ordinary shares that are authorized for issuance under our equity compensation plans.

Equity Compensation Plan Information

<u>Plan Category</u>	<u>Number of securities to be issued upon exercise of outstanding options, warrants and rights (1)(2)</u>	<u>Weighted average exercise price of outstanding options, warrants and rights (1)(2)</u>	<u>Number of securities available for future issuance under equity compensation plans (excluding securities reflected in the first column)</u>
Equity compensation plans approved by security holders:			
Liberty Global 2014 Incentive Plan (3):			
Total ordinary shares available for issuance			49,290,093
Liberty Global Class A ordinary shares	23,434,839	\$ 27.08	
Liberty Global Class C ordinary shares	52,078,380	\$ 26.24	
Liberty Global 2014 Nonemployee Director Incentive Plan (4):			
Total ordinary shares available for issuance			7,678,752
Liberty Global Class A ordinary shares	525,142	\$ 30.73	
Liberty Global Class C ordinary shares	2,045,716	\$ 25.80	
Liberty Global 2005 Incentive Plan (5):			
Liberty Global Class A ordinary shares	2,659,898	\$ 28.15	
Liberty Global Class C ordinary shares	7,858,498	\$ 26.72	
Liberty Global 2005 Director Incentive Plan (5):			
Liberty Global Class A ordinary shares	55,376	\$ 27.10	
Liberty Global Class C ordinary shares	173,258	\$ 25.61	
VM Incentive Plan (5):			
Liberty Global Class A ordinary shares	25,914	\$ 24.49	
Liberty Global Class C ordinary shares	879,039	\$ 24.29	
Equity compensation plans not approved by security holders:			
None			
Totals:			
Total ordinary shares available for issuance			56,968,845
Liberty Global Class A ordinary shares	26,701,169		
Liberty Global Class C ordinary shares	63,034,891		

- (1) This table includes (i) SARs and PSARs with respect to 22,650,134 and 3,455,102 Liberty Global Class A shares, respectively, and 53,058,054 and 6,910,208 Liberty Global Class C ordinary shares, respectively. Upon exercise, the appreciation of a SAR, which is the difference between the base price of the SAR and the then-market value of the respective underlying class of ordinary shares or in certain cases, if lower, a specified price, may be paid in shares of the applicable class of ordinary shares. Based upon the respective market prices of Liberty Global Class A and Class C ordinary shares at December 31, 2021 and excluding any related tax effects, 2,311,162 and 6,102,902 Liberty Global Class A and Liberty Global Class C ordinary shares, respectively, would have been issued if all outstanding and in-the-money SARs had been exercised on December 31, 2021. For further information, see note 15 to our consolidated financial statements.

- (2) In addition to the option, SAR and PSAR information included in this table, there are outstanding RSU and PSU awards under the various incentive plans with respect to an aggregate of 3,646,444 and 7,292,052, Liberty Global Class A and Liberty Global Class C ordinary shares, respectively.
- (3) The Liberty Global 2014 Incentive Plan permits grants of, or with respect to, Liberty Global Class A, Class B, or Class C ordinary shares subject to a single aggregate limit of 155 million shares (of which no more than 50.25 million shares may consist of Class B shares), subject to anti-dilution adjustments. As of December 31, 2021, an aggregate of 49,290,093 ordinary shares were available for issuance pursuant to the incentive plan. For further information, see note 15 to our consolidated financial statements.
- (4) The Liberty Global 2014 Nonemployee Director Incentive Plan permits grants of, or with respect to, Liberty Global Class A, Class B, or Class C ordinary shares subject to a single aggregate limit of 10.5 million shares, subject to anti-dilution adjustments. As of December 31, 2021, an aggregate of 7,678,752 ordinary shares were available for issuance pursuant to the Liberty Global 2014 Nonemployee Director Incentive Plan. For further information, see note 15 to our consolidated financial statements.
- (5) On January 30, 2014, our shareholders approved the Liberty Global 2014 Incentive Plan and the Liberty Global 2014 Nonemployee Director Incentive Plan and, accordingly, no further awards will be granted under the Liberty Global 2005 Incentive Plan, the Liberty Global 2005 Director Incentive Plan or the VM Incentive Plan.

PART IV

Item 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) (1) FINANCIAL STATEMENTS

The financial statements required under this Item begin on page II-43 of this Annual Report on Form 10-K.

(a) (2) FINANCIAL STATEMENT SCHEDULES

The financial statement schedules required under this Item are as follows:

Schedule I - Condensed Financial Information of Registrant (Parent Company Information):

Liberty Global plc Condensed Balance Sheets as of December 31, 2021 and 2020 (Parent Company Only)	<u>IV-9</u>
Liberty Global plc Condensed Statements of Operations for the years ended December 31, 2021, 2020 and 2019 (Parent Company Only)	<u>IV-10</u>
Liberty Global plc Condensed Statements of Cash Flows for the years ended December 31, 2021, 2020 and 2019 (Parent Company Only)	<u>IV-11</u>
Schedule II - Valuation and Qualifying Accounts	<u>IV-12</u>

(a) (3) EXHIBITS

Listed below are the exhibits filed as part of this Annual Report on Form 10-K (according to the number assigned to them in Item 601 of Regulation S-K):

2 -- Plan of Acquisition, Reorganization, Arrangement, Liquidation or Succession:

- 2.1 Amended Sale and Purchase Agreement, dated as of May 9, 2018, as amended, by and among Liberty Global plc and Vodafone Group plc and certain of their respective subsidiaries (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed August 5, 2019 (File No. 001-35961)).***
- 2.2 Contribution Agreement, dated May 7, 2020, by and among Liberty Global plc, Liberty Global Europe 2 Limited, Liberty Global Holdco Limited, Telefónica, S.A., and Telefonica O2 Holdings Limited (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed May 13, 2020 (File No. 001-35961)).***
- 2.3 Transaction Agreement, dated as of August 12, 2020 between Liberty Global plc and Sunrise Communications Group AG (incorporated by reference to Exhibit 2.1 to the Registrant's Quarterly Report on Form 10-Q filed November 4, 2020 (File No. 001-35961)).
- 2.4 Sale and Purchase Agreement, dated as of September 22, 2021, by and among Liberty Global plc, UPC Poland Holding B.V., P4 sp.z o.o. and Iliad S.A. (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed September 23, 2021 (File No. 001-35961)).***

3 -- Articles of Incorporation and Bylaws:

- 3.1 Articles of Association of Liberty Global plc, effective as of July 1, 2015 (incorporated by reference to Exhibit 3.1 to the Registrant's Registration Statement on Form 8-A filed June 19, 2015 (File No. 001-35961)).

4 -- Instruments Defining the Rights of Securities Holders, including Indentures:

- 4.1 Description of the Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934 (incorporated by reference to Exhibit 4.1 to the Registrant's Annual Report on Form 10-K filed February 13, 2020 (File No. 001-35961)).
- 4.2 Amended Credit Agreement to Senior Secured Credit Facility Agreement originally dated January 16, 2004, dated November 29, 2017, among UPC Broadband Holding B.V. (UPC Broadband Holding) as Borrower, The Bank of Nova Scotia, as Facility Agent, the Guarantors listed therein, the Security Agent and the bank and financial institutions acceding thereto from time to time (the UPC Broadband Holding Bank Facility) (incorporated by reference to Schedule 2 of Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed December 5, 2017 (File No. 001-35961)) (the December 2017 8-K)).
- 4.3 Supplemental Deed dated November 29, 2017, between UPC Broadband Holding, as Obligor, and the Bank of Nova Scotia, as Facility Agent and Security Agent, which is supplemental to and amends the UPC Broadband Holding Bank Facility (incorporated by reference to Exhibit 4.1 to the December 2017 8-K).

- 4.4 Indenture dated April 15, 2015, among UPCB Finance IV Limited, The Bank of New York Mellon, London Branch as Trustee, Principal Paying Agent, Transfer Agent and Security Agent, The Bank of New York Mellon as New York Paying Agent, New York Transfer Agent and Dollar Notes Registrar and The Bank of New York Mellon (Luxembourg) S.A. as Euro Notes Registrar and Transfer Agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed April 21, 2015 (File No. 001-35961)) (the April 2015 8-K/A)).
- 4.5 Additional Facility AK Accession Agreement, dated April 15, 2015, among UPC Financing Partnership (UPC Financing) as Borrower, The Bank of Nova Scotia as Facility Agent and Security Agent, UPC Broadband Holding and UPCB Finance IV Limited as Additional Facility AK Lender, under the UPC Broadband Holding Bank Facility (incorporated by reference to Exhibit 4.2 to the April 2015 8-K/A).
- 4.6 Additional Facility AL Accession Agreement, dated April 15, 2015, among UPC Financing as Borrower, The Bank of Nova Scotia as Facility Agent and Security Agent, UPC Broadband Holding and UPCB Finance IV Limited as Additional Facility AL Lender, under the UPC Broadband Holding Bank Facility (incorporated by reference to Exhibit 4.3 to the April 2015 8-K/A).
- 4.7 Additional Facility AL2 Accession Agreement, dated May 20, 2015, among UPC Financing as Borrower, The Bank of Nova Scotia as Facility Agent and Security Agent, UPC Broadband Holding and UPCB Finance IV Limited as Additional Facility AL2 Lender, under the UPC Broadband Holding Bank Facility (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed May 21, 2015 (File No. 001-35961)).
- 4.8 Additional Facility AM Accession Agreement, dated August 3, 2015, among UPC Financing as Borrower, The Bank of Nova Scotia as Facility Agent and Security Agent and the financial institutions listed therein as Additional Facility AM Lenders, under the UPC Broadband Holding Bank Facility (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed August 6, 2015 (File No. 001-35961)).
- 4.9 Additional Facility AQ Accession Agreement dated June 21, 2017 and entered into between, among others, UPC Financing and UPC Broadband Holding as borrowers and The Bank of Nova Scotia as Facility Agent and Security Agent and the financial institutions listed therein as Additional Facility AQ Lenders under the UPC Broadband Holding Bank Facility (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed June 27, 2017 (File No. 001-35961)).
- 4.10 Additional Facility AT Accession Agreement dated January 31, 2020 and entered into between, among others, UPC Financing Partnership as the Borrower and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed February 6, 2020 (File No. 001-35961)) (the February 6, 2020 8-K).
- 4.11 Additional Facility AU Accession Agreement dated January 31, 2020 and entered into between, among others, UPC Broadband Holding B.V. as the Borrower and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.2 to the February 6, 2020 8-K).
- 4.12 Additional Facility AV Accession Agreement dated August 20, 2020 and entered into between, among others, UPC Financing Partnership as the Borrower and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed August 26, 2020 (File No. 001-35961)) (the August 26, 2020 8-K)).
- 4.13 Additional Facility AW Accession Agreement dated August 20, 2020 and entered into between, among others, UPC Broadband Holding B.V. as the Borrower and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.2 to the August 26, 2020 8-K).
- 4.14 Additional Facility AN Accession Agreement dated May 24, 2018 and entered into between, among others, Telenet Financing USD LLC as the Borrower, Telenet BVBA as a Guarantor and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed May 31, 2018 (File No. 001-35961)) (the May 2018 8-K)).
- 4.15 Additional Facility AR Accession Agreement dated January 24, 2020 and entered into between, among others, Telenet Financing USD LLC as the Borrower, Telenet BVBA as a Guarantor and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed January 30, 2020 (File No. 001-35961)) (the January 30, 2020 8-K)).
- 4.16 Additional Facility AQ Accession Agreement dated January 24, 2020 and entered into between, among others, Telenet International Finance S.à.r.l. as the Borrower, Telenet BVBA as a Guarantor and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.2 to the January 30, 2020 8-K).
- 4.17 Additional Facility AP Accession Agreement dated May 24, 2019 and entered into between, among others, Telenet International Finance S.à.r.l. as the Borrower, the Guarantors listed therein and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed May 30, 2019 (File No. 001-35961)).
- 4.18 Indenture dated December 13, 2017 between Telenet Finance Luxembourg Notes S.a.r.l., The Bank of New York Mellon, London Branch, as Trustee and Security Trustee and The Bank of New York Mellon SA/NV, Luxembourg Branch, as Transfer Agent and Registrar (incorporated by reference to Exhibit 4.4 to the Registrant's Current Report on Form 8-K filed December 18, 2017 (File No. 000.35961)) (the December 2017 8-K/A)).

- 4.19 Additional Facility AJ Accession Agreement dated December 13, 2017 and entered into between, among others, Telenet International Finance S.a.r.l. as the Borrower, Telenet Financing USD LLC as a Guarantor, The Bank of Nova Scotia as Facility Agent and KBC Bank NV as Security Agent (incorporated by reference to Exhibit 4.5 to the December 2017 8-K/A).
- 4.20 Additional Facility AK Accession Agreement dated December 13, 2017 and entered into between, among others, Telenet International Finance S.a.r.l. as the Borrower, Telenet Financing USD LLC as a Guarantor, The Bank of Nova Scotia as Facility Agent and KBC Bank NV as Security Agent (incorporated by reference to Exhibit 4.6 to the December 2017 8-K/A).
- 4.21 Telenet Supplemental Agreement (Credit Agreement) dated November 16, 2018 between among others, Telenet BVBA as the company, The Bank of Nova Scotia as facility agent and KBC Bank NV as security agent (incorporated by reference to Exhibit 4.1 to the November 2018 8-K).
- 4.22 Indenture dated March 28, 2014 between Virgin Media Secured Finance PLC, The Bank of New York Mellon, London Branch, as Trustee, Transfer Agent and Principal Paying Agent, The Bank of New York Mellon as Paying Agent, and The Bank of New York Mellon (Luxembourg) S.A., as Registrar (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed April 3, 2014 (File No. 001-35961)).
- 4.23 Indenture dated January 28, 2015 between Virgin Media Finance PLC, The Bank of New York Mellon, London Branch, as Trustee and Principal Paying Agent, The Bank of Mellon as Paying Agent and Dollar Notes Transfer Agent and Registrar and The Bank of New York Mellon (Luxembourg) S.A., as Euro Notes Registrar and Transfer Agent (incorporated by reference to Exhibit 4.2 to the February 2015 8-K/A).
- 4.24 Additional L Facility Accession Deed dated November 10, 2017, between Virgin Media Investment Holdings Limited as the Company, Virgin Media SFA Finance Limited as the Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional L Facility Lender under the VMF Senior Facilities Agreement (incorporated by reference to Exhibit 4.2 to the November 2017 8-K).
- 4.25 Additional M Facility Accession Deed dated November 10, 2017, between Virgin Media Investment Holdings Limited as the Company, Virgin Media SFA Finance Limited as the Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional M Facility Lender under the VMF Senior Facilities Agreement (incorporated by reference to Exhibit 4.3 to the November 2017 8-K).
- 4.26 Additional N Facility Accession Deed dated October 4, 2019, between Virgin Media Investment Holdings Limited as the Company, Virgin Media Bristol LLC as the Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional N Facility Lender (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed October 10, 2019 (File No. 001-35961)) (the October 10, 2019 8-K)).
- 4.27 Additional O Facility Accession Deed dated October 4, 2019, between Virgin Media Investment Holdings Limited as the Company, Virgin Media SFA Finance Limited as the Facility O Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional O Facility Lender (incorporated by reference to Exhibit 4.2 to the October 10, 2019 8-K).
- 4.28 Facility P Accession Deed dated December 7, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and the Additional Facility P Lenders (as defined therein) (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed December 11, 2020 (File No. 001-35961)).
- 4.29 Additional Facility Q Accession Deed dated September 11, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, Virgin Media Bristol LLC as Borrower, The Bank of Nova Scotia as the Facility Agent and the Additional Facility Q Lenders (as defined therein) (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed September 16, 2020 (the September 16, 2020 8-K)).
- 4.30 Additional Facility R Accession Deed dated September 11, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and the Additional Facility R Lenders (as defined therein) (incorporated by reference to Exhibit 4.2 to the September 16, 2020 8-K).
- 4.31 Additional Facility S Accession Deed dated September 24, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and VMED O2 UK Financing I plc as the Additional Facility S Lender (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed September 30, 2020 (the September 30, 2020 8-K)).
- 4.32 Additional Facility T Accession Deed dated September 24, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and VMED O2 UK Financing I plc as the Additional Facility T Lender (incorporated by reference to Exhibit 4.2 to the September 30, 2020 8-K).

- 4.33 Additional Facility U Accession Deed dated September 24, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and VMED O2 UK Financing 1 plc as the Additional Facility U Lender (incorporated by reference to Exhibit 4.3 to the September 30, 2020 8-K).
- 4.34 Additional Facility AV2 Accession Agreement dated April 12, 2021 and entered into between, among others, UPC Financing Partnership as the Borrower and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed April 16, 2021 (File no. 001-35961)) (the April 16, 2021 8-K).
- 4.35 Additional Facility AW2 Accession Agreement dated April 12, 2021 and entered into between, among others, UPC Broadband Holding B.V. as the Borrower and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.2 to the April 16, 2021 8-K).
- 4.36 Amended Credit Agreement dated April 12, 2021 and entered into between, among others, UPC Broadband and Upsizing Revolving Facility lenders (named therein) and The Bank of Nova Scotia as the Facility Agent and Security Agent (incorporated by reference to Exhibit 4.3 to the April 16, 2021 8-K).
- 4.37 Additional Facility AX Accession Agreement dated April 20, 2021 and entered into between, among others, UPC Financing Partnership as the Borrower and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed April 26, 2021 (File no. 001-35961)) (the April 26, 2021 8-K).
- 4.38 Additional Facility AY Accession Agreement dated April 20, 2021 and entered into between, among others, UPC Broadband Holding B.V. as the Borrower and The Bank of Nova Scotia as the Facility Agent (incorporated by reference to Exhibit 4.2 to the April 26, 2021 8-K).
- 4.39 Additional Facility AZ Accession Agreement dated April 21, 2021 and entered into between, among others, UPC Broadband Holding B.V. as the Company, UPC Financing Partnership as the Borrower, The Bank of Nova Scotia as the Facility Agent and UPC Broadband Finco B.V. as the Additional Facility AZ Lender (incorporated by reference to Exhibit 4.3 to the April 26, 2021 8-K).
- 4.40 Amendment and Restatement Agreement dated December 9, 2019 between Virgin Media Investment Holdings Limited (for itself and as agent on behalf of the other obligors) and The Bank of Nova Scotia (as facility agent), and attached as a schedule thereto, a copy of the Senior Facilities Agreement, originally dated June 7, 2013, between, among others, Virgin Media Investment Holdings Limited as a borrower and a guarantor, The Bank of Nova Scotia as facility agent and Deutsche Bank AG, London Branch as security trustee as amended and restated by the Amendment and Restatement Agreement (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed December 13, 2019 (File No. 001-35961)).
- 4.41 Indenture dated May 16, 2019, among Virgin Media Secured Finance PLC, as Issuer, BNY Mellon Corporate Trustee Services Limited as Trustee, The Bank of New York Mellon, London Branch, as Principal Paying Agent and The Bank of New York Mellon SA/NV, Luxembourg Branch, as Registrar and Transfer Agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed May 17, 2019 (File No. 001-35961)).
- 4.42 Supplemental Indenture, dated as of July 5, 2019, between Virgin Media Secured Finance PLC as Issuer and BNY Mellon Corporate Trustee Services Limited as Trustee, to the Indenture dated May 16, 2019 for 5.50% Senior Secured Notes and 5.25% Senior Secured Notes, each due 2029 (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed July 9, 2019 (File No. 001-35961)).
- 4.43 SEA/ICA Accession Deed dated October 21, 2019, among UPC Poland Holding B.V., UPC Polska Sp. z o.o., UPC Poland Property Sp. z o.o., Liberty Global Europe Holdco 2 B.V., and The Bank of Nova Scotia as the Facility Agent and Security Agent, to the Amended Credit Agreement to Senior Secured Credit Facility Agreement originally dated January 16, 2004 (as amended and restated from time to time, including the Supplemental Deed dated November 29, 2017) (incorporated by reference to Exhibit 4.6 to the Registrant's Quarterly Report on Form 10-Q filed November 6, 2019 (File No. 001-35961)) (the November 2019 10-Q)).
- 4.44 Supplemental Agreement dated April 6, 2020 between, among others, Telenet BV as company, The Bank of Nova Scotia as facility agent and KBC Bank NV as security agent and attached as a schedule thereto, a copy of the Amended and Restated Credit Agreement dated April 6, 2020, between, among others, Telenet BV as original borrower and The Bank of Nova Scotia as facility agent and KBC Bank NV as security agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed April 10, 2020 (File No. 001-35961)).
- 4.45 Supplemental Deed dated April 23, 2020 between, among others, UPC Broadband Holding B.V. as Obligors' Agent and The Bank of Nova Scotia as facility agent and security agent and, attached as a schedule thereto, a copy of the Amended Senior Facilities Agreement dated April 23, 2020 between, among others, UPC Broadband Holding B.V. as borrower and The Bank of Nova Scotia as facility agent and security agent (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed April 29, 2020 (File No. 001-35961)).

The Registrant undertakes to furnish to the Securities and Exchange Commission, upon request, a copy of all instruments with respect to long-term debt not filed herewith.

10 -- Material Contracts:

- 10.1 Deed of Assumption of Liberty Global plc, dated June 7, 2013 (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed June 7, 2013 (File No. 001-35961)(the June 7, 2013 8-K)).
- 10.2+ Liberty Global 2014 Incentive Plan (Amended and Restated effective June 11, 2019 (as amended and restated from time to time, the Incentive Plan)) (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed August 8, 2019 (File No. 001-35961) (the August 2019 10-Q)).
- 10.3+ Liberty Global 2014 Nonemployee Director Incentive Plan Effective March 1, 2014 (the Director Plan) (incorporated by reference to Appendix B to the Registrant's Proxy Statement on Schedule 14A filed December 19, 2013 (File No. 001-35961)).
- 10.4+ Form of Non-Qualified Share Option Agreement under the Director Plan (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed August 5, 2014 (File No. 001-35961) (the August 5, 2014 10-Q)).
- 10.5+ Form of Restricted Share Units Agreement under the Director Plan (incorporated by reference to Exhibit 10.4 to the August 5, 2014 10-Q).
- 10.6+ Liberty Global, Inc. 2005 Incentive Plan (as amended and restated effective June 7, 2013) (the 2005 Incentive Plan) (incorporated by reference to Exhibit 10.2 to the June 7, 2013 8-K).
- 10.7+ Liberty Global, Inc. 2005 Nonemployee Director Incentive Plan (as amended and restated effective June 7, 2013) (the 2005 Director Plan) (incorporated by reference to Exhibit 10.3 to the June 7, 2013 8-K).
- 10.8+ Virgin Media 2010 Stock Incentive Plan (as amended and restated effective June 7, 2013) (incorporated by reference to Exhibit 10.4 to the June 7, 2013 8-K).
- 10.9+ Form of Non-Qualified Share Option Agreement under the 2005 Director Plan (incorporated by reference to Exhibit 10.6 to the Registrant's Quarterly Report on Form 10-Q filed August 1, 2013 (File No. 001-35961)).
- 10.10+ Liberty Global Compensation Policy for Nonemployee Directors effective June 21, 2017 (incorporated by reference to Appendix A to the Registrant's Proxy Statement on Schedule 14A filed May 1, 2017 (File No. 001-35961)).
- 10.11+ Form of Deed of Indemnity between Liberty Global and its Directors and Executive Officers (incorporated by reference to Exhibit 10.10 to the June 7, 2013 8-K).
- 10.12+ Form of Stock Appreciation Rights Agreement under the 2005 Incentive Plan (incorporated by reference to Exhibit 10.3 to Liberty Global, Inc.'s (LGI) Quarterly Report on Form 10-Q filed May 7, 2008 (File No. 000-51360)).
- 10.13+ Form of Performance Share Units Agreement for executive officers under the Incentive Plan (incorporated by reference to Exhibit 10.16 to the Registrant's Annual Report on Form 10-K filed February 27, 2019 and amended on Form 10-K/A filed March 27, 2019 (File No. 001-35961) (the 2019 10-K)).
- 10.14+ Liberty Global 2019 Challenge Performance Award program for senior management, including our executive officers under the Incentive Plan (a description of said program is incorporated by reference to the description thereof included in Item 5.02(e) of the Registrant's Current Report on Form 8-K filed March 13, 2019 (File No. 001-35961)).
- 10.15+ Liberty Global 2020 Annual Performance Award Program for executive officers under the Incentive Plan (description of said plan is incorporated by reference to the description thereof included in Item 5.02(e) of the Registrant's Current Report on Form 8-K filed April 3, 2020 (File No. 001-35961)).
- 10.16+ Deferred Compensation Plan (adopted effective December 15, 2008; Amended and Restated as of October 26, 2015) (incorporated by reference to Exhibit 10.29 to the Registrant's Annual Report on Form 10-K filed February 16, 2016 (File No. 001-35961) (the 2016 10-K)).
- 10.17+ Nonemployee Director Deferred Compensation Plan (As Amended and Restated Effective December 11, 2015) (incorporated by reference to Exhibit 10.30 to the 2016 10-K).
- 10.18+ Personal Usage of Aircraft Policy, restated June 7, 2013 (incorporated by reference to Exhibit 10.31 to the 2016 10-K).
- 10.19+ Form of Aircraft Time Sharing Agreement (7X) (incorporated by reference to Exhibit 10.29 to LGI's Annual Report on Form 10-K filed February 13, 2013 (File No. 000-51360)).
- 10.20+ Form of Share Appreciation Rights Agreement between the Registrant and our Chief Executive Officer under the Incentive Plan (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed August 4, 2016 (File No. 001-35961)).
- 10.21+ Executive Service Agreement, dated December 15, 2004, between UPC Services Limited and Charles Bracken (incorporated by reference to Exhibit 10.36 to LGI's Annual Report on Form 10-K filed February 24, 2010 (File No. 000-51360)).
- 10.22+ Employment Agreement dated as of June 28, 2018, between LGI and Enrique Rodriguez (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed August 8, 2018 (File No. 001-35961)).
- 10.23+ Amended and Restated Employment Agreement dated as of April 30, 2019, by and among the Registrant, Liberty Global Inc. and Michael T. Fries (incorporated by reference to Exhibit 10.9 to the August 2019 10-Q).

- 10.24+ Employment Agreement, dated May 21, 2020, by and between Liberty Global, Inc. and Bryan H. Hall (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed August 3, 2020 (File No. 001-35961) (the August 2020 10-Q)).
- 10.25+ Employment Agreement, dated May 19, 2005, by and between Liberty Global Europe Limited (formerly known as UGC Europe Services Ltd.) and Andrea Salvato, assigned by Liberty Global Europe Limited to Liberty Global plc on November 1, 2013 (incorporated by reference to Exhibit 10.3 to the August 2020 10-Q).
- 10.26+ Form of Performance Share Appreciation Rights Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.2 to the August 2019 10-Q).
- 10.27+ Form of Performance Restricted Share Units Agreement (SHIP) under the Incentive Plan (incorporated by reference to Exhibit 10.4 to the August 2019 10-Q).
- 10.28+ Form of Share Appreciation Rights Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.5 to the August 2019 10-Q).
- 10.29+ Form of Performance Share Units Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.7 to the August 2019 10-Q).
- 10.30+ Form of Performance Share Units Agreement between the Registrant and our Chief Executive Officer under the Incentive Plan (incorporated by reference to Exhibit 10.8 to the August 2019 10-Q).
- 10.31+ Form of Share Appreciation Rights Agreement between Registrant and our Chief Executive Officer under the Incentive Plan (incorporated by reference to Exhibit 10.1 to the November 2019 10-Q).
- 10.32+ Form of Performance Share Appreciation Rights Agreement between Registrant and our Chief Executive Officer under the Incentive Plan (incorporated by reference to Exhibit 10.2 to the November 2019 10-Q).
- 10.33+ Form of Restricted Share Units Agreement (SHIP) under the Incentive Plan (incorporated by reference to Exhibit 10.6 to the November 2019 10-Q).
- 10.34+ Form of Restricted Share Units Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.3 to the November 2019 10-Q).
- 10.35+ Form of Performance Restricted Share Units Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.4 to the November 2019 10-Q).
- 10.36+ Form of Performance Restricted Share Units Agreement between Registrant and our Chief Executive Officer under the Incentive Plan (incorporated by reference to Exhibit 10.5 to the November 2019 10-Q).
- 10.37 Trade Mark Licence, dated as of April 3, 2006, between Virgin Enterprises Limited and NTL Group Limited (incorporated by reference to Exhibit 10.2 to Virgin Media's Quarterly Report on Form 10-Q filed August 9, 2006 (File No. 000-50886)).
- 10.38 Amendment Letter No. 1, dated February 8, 2007, to the Trade Mark Licence between Virgin Enterprises Limited and Virgin Media Limited dated April 3, 2006 (incorporated by reference to Exhibit 10.5 to Virgin Media's Quarterly Report on Form 10-Q filed August 8, 2007 (File No. 000-50886)).
- 10.39 Amendment Letter No. 2, dated October 1, 2007, to the Trade Mark Licence between Virgin Enterprises Limited and Virgin Media Limited dated April 3, 2006 (incorporated by reference to Exhibit 10.6 to Virgin Media's Quarterly Report on Form 10-Q filed November 8, 2007 (File No. 000-50886)).
- 10.40 Trade Mark Licence between Virgin Enterprises Limited and Virgin Media Limited dated December 16, 2009 (incorporated by reference to Exhibit 10.83 to Virgin Media's Annual Report on Form 10-K filed February 26, 2010 (File No. 000-50886)).
- 10.41 Shareholders' Agreement, dated December 31, 2016, by and among, Vodafone International Holdings B.V., Vodafone Group Plc, Liberty Global Europe Holding B.V., the Registrant and Lynx Global Europe II B.V. (incorporated by reference to Exhibit 10.2 to the January 2017 8-K).
- 10.42 Shareholders Agreement, dated June 1, 2021, by and among Liberty Global plc, Liberty Global Europe 2 Limited, Liberty Global Holdco Limited, Telefonica, S.A. and Telefonica O2 Holdings Limited (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed June 4, 2021 (File No. 001-35961)).
- 10.43+ Liberty Global 2020 Long-Term Equity Incentive Program for executive officers under the Incentive Plan (description of said plan is incorporated by reference to the description thereof included in Item 5.02(e) of the Registrant's Current Report on Form 8-K filed April 3, 2020 (File No. 001-35961)).
- 10.44+ Liberty Global 2021 Long-Term Equity Incentive Program for executive officers under the Company's 2021 long-term incentive plan (description of said plan is incorporated by reference to the description thereof included in Item 5.02(e) of Registrant's Current Report on Form 8-K filed April 15, 2021 (File No. 001-35961)).

21 -- List of Subsidiaries*

23 -- Consent of Experts and Counsel:

23.1 Consent of KPMG LLP*

31 -- Rule 13a-14(a)/15d-14(a) Certification:

31.1 Certification of President and Chief Executive Officer*

31.2 Certification of Executive Vice President and Chief Financial Officer (Principal Financial Officer)*

32 -- Section 1350 Certification **

101.SCH Inline XBRL Taxonomy Extension Schema Document*
101.CAL Inline XBRL Taxonomy Extension Calculation Linkbase Document*
101.DEF Inline XBRL Taxonomy Extension Definition Linkbase*
101.LAB Inline XBRL Taxonomy Extension Label Linkbase Document*
101.PRE Inline XBRL Taxonomy Extension Presentation Linkbase Document*
104 Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)*

* Filed herewith

** Furnished herewith

*** Schedules and similar attachments to the agreement have been omitted pursuant to Item 601(a)(5) of Regulation S-K. The Registrant hereby undertakes to furnish supplemental copies of any of the omitted schedules and similar attachments upon request by the United States Securities and Exchange Commission

+ This document has been identified as a management contract or compensatory plan or arrangement.

Item 16. FORM 10-K SUMMARY

None.

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.

LIBERTY GLOBAL PLC

Dated: February 17, 2022

/s/ BRYAN H. HALL

Bryan H. Hall
Executive Vice President, General Counsel and Secretary

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the date indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ JOHN C. MALONE</u> John C. Malone	Chairman of the Board	February 17, 2022
<u>/s/ MICHAEL T. FRIES</u> Michael T. Fries	President, Chief Executive Officer and Director	February 17, 2022
<u>/s/ ANDREW J. COLE</u> Andrew J. Cole	Director	February 17, 2022
<u>/s/ MIRANDA CURTIS</u> Miranda Curtis	Director	February 17, 2022
<u>/s/ JOHN W. DICK</u> John W. Dick	Director	February 17, 2022
<u>/s/ PAUL A. GOULD</u> Paul A. Gould	Director	February 17, 2022
<u>/s/ RICHARD R. GREEN</u> Richard R. Green	Director	February 17, 2022
<u>/s/ DAVID E. RAPLEY</u> David E. Rapley	Director	February 17, 2022
<u>/s/ LARRY E. ROMRELL</u> Larry E. Romrell	Director	February 17, 2022
<u>/s/ J. DAVID WARGO</u> J. David Wargo	Director	February 17, 2022
<u>/s/ CHARLES H.R. BRACKEN</u> Charles H.R. Bracken	Executive Vice President and Chief Financial Officer	February 17, 2022
<u>/s/ JASON WALDRON</u> Jason Waldron	Senior Vice President and Chief Accounting Officer	February 17, 2022

LIBERTY GLOBAL PLC
SCHEDULE I
(Parent Company Information - See Notes to Consolidated Financial Statements)
CONDENSED BALANCE SHEETS
(Parent Company Only)

	December 31,	
	2021	2020
	in millions	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 1.7	\$ 33.1
Other receivables — related-party	31.3	39.6
Current notes receivable — related-party	0.8	—
Other current assets	30.5	100.0
Total current assets	64.3	172.7
Long-term notes receivable — related-party	455.4	359.3
Investments in consolidated subsidiaries, including intercompany balances	52,617.8	37,746.4
Other assets, net	6.7	149.0
Total assets	\$ 53,144.2	\$ 38,427.4
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 1.1	\$ 0.5
Other payables — related-party	72.0	41.3
Other current liabilities — related party	—	42.2
Current portion of notes payable — related-party	11,281.7	9,243.2
Current interest payable — related-party	568.8	—
Accrued liabilities and other	23.9	11.6
Total current liabilities	11,947.5	9,338.8
Long-term notes payable — related-party	15,253.7	15,422.3
Other long-term liabilities	8.1	3.7
Total liabilities	27,209.3	24,764.8
Commitments and contingencies		
Shareholders' equity:		
Class A ordinary shares, \$0.01 nominal value. Issued and outstanding 174,310,558 and 181,348,114 shares, respectively	1.8	1.8
Class B ordinary shares, \$0.01 nominal value. Issued and outstanding 12,930,839 and 12,561,444 shares, respectively	0.1	0.1
Class C ordinary shares, \$0.01 nominal value. Issued and outstanding 340,114,729 and 386,588,921 shares, respectively	3.4	3.9
Additional paid-in capital	3,893.0	5,271.7
Accumulated earnings	18,144.5	4,692.1
Accumulated other comprehensive earnings, net of taxes	3,892.2	3,693.1
Treasury shares, at cost	(0.1)	(0.1)
Total shareholders' equity	25,934.9	13,662.6
Total liabilities and shareholders' equity	\$ 53,144.2	\$ 38,427.4

LIBERTY GLOBAL PLC
SCHEDULE I
(Parent Company Information - See Notes to Consolidated Financial Statements)
CONDENSED STATEMENTS OF OPERATIONS
(Parent Company Only)

	Year ended December 31,		
	2021	2020	2019
	in millions		
Operating costs and expenses:			
Selling, general and administrative (including share-based compensation)	\$ 77.6	\$ 58.8	\$ 61.0
Related-party fees and allocations	182.5	36.0	20.6
Depreciation and amortization	1.4	1.4	1.4
Other operating expenses	—	—	0.2
Operating loss	(261.5)	(96.2)	(83.2)
Non-operating income (expense):			
Interest expense — related-party	(1,185.6)	(1,086.9)	(864.6)
Interest income — related-party	31.7	45.1	89.6
Foreign currency transaction gains (losses), net	317.7	(330.2)	281.2
Realized and unrealized gains on derivative instruments, net	9.0	—	—
Other income, net	0.1	2.1	3.4
	(827.1)	(1,369.9)	(490.4)
Loss before income taxes and equity in earnings (loss) of consolidated subsidiaries, net	(1,088.6)	(1,466.1)	(573.6)
Equity in earnings (loss) of consolidated subsidiaries, net	14,530.5	(401.0)	11,921.4
Income tax benefit (expense)	(15.1)	239.1	173.6
Net earnings (loss)	<u>\$ 13,426.8</u>	<u>\$ (1,628.0)</u>	<u>\$ 11,521.4</u>

LIBERTY GLOBAL PLC
SCHEDULE I
(Parent Company Information - See Notes to Consolidated Financial Statements)
CONDENSED STATEMENTS OF CASH FLOWS
(Parent Company Only)

	Year ended December 31,		
	2021	2020	2019
	in millions		
Cash flows from operating activities:			
Net earnings (loss)	\$ 13,426.8	\$ (1,628.0)	\$ 11,521.4
Adjustments to reconcile net earnings (loss) to net cash used by operating activities:			
Equity in loss (earnings) of consolidated subsidiaries, net	(14,530.5)	401.0	(11,921.4)
Share-based compensation expense	49.4	30.4	35.8
Related-party fees and allocations	182.5	36.0	20.6
Depreciation and amortization	1.4	1.4	1.4
Other operating expenses	—	—	0.2
Realized and unrealized gains on derivative instruments, net	(9.0)	—	—
Foreign currency transaction losses (gains), net	(317.7)	330.2	(281.2)
Deferred income tax expense (benefit)	15.1	(15.1)	(10.0)
Changes in operating assets and liabilities:			
Receivables and other operating assets	85.3	(135.0)	(213.7)
Payables and accruals	709.9	865.9	554.3
Net cash used by operating activities	<u>(386.8)</u>	<u>(113.2)</u>	<u>(292.6)</u>
Cash flows from investing activities:			
Investments in and advances to consolidated subsidiaries, net	(274.8)	(494.1)	(142.8)
Cash released from (used to fund) the Vodafone Escrow Accounts, net	214.9	104.9	(295.2)
Other investing activities, net	(0.1)	(0.1)	(0.1)
Net cash used by investing activities	<u>(60.0)</u>	<u>(389.3)</u>	<u>(438.1)</u>
Cash flows from financing activities:			
Borrowings of related-party debt	2,445.3	2,087.5	5,870.5
Repayments of related-party debt	(443.3)	(483.2)	(2,018.6)
Repurchases of Liberty Global ordinary shares	(1,580.4)	(1,072.3)	(3,219.4)
Borrowings of third-party debt	—	—	98.6
Proceeds from issuance of Liberty Global shares upon exercise of options	8.9	2.2	2.3
Other financing activities, net	(15.3)	(5.1)	(7.3)
Net cash provided by financing activities	<u>415.2</u>	<u>529.1</u>	<u>726.1</u>
Effect of exchange rate changes on cash and cash equivalents and restricted cash	0.1	(0.2)	0.5
Net increase (decrease) in cash and cash equivalents and restricted cash	<u>(31.5)</u>	<u>26.4</u>	<u>(4.1)</u>
Cash and cash equivalents and restricted cash:			
Beginning of period	38.3	11.9	16.0
End of period	<u>\$ 6.8</u>	<u>\$ 38.3</u>	<u>\$ 11.9</u>
Details of end of period cash and cash equivalents and restricted cash:			
Cash and cash equivalents	\$ 1.7	\$ 33.1	\$ 6.7
Restricted cash included in other current assets	5.1	5.2	5.2
Total cash and cash equivalents and restricted cash	<u>\$ 6.8</u>	<u>\$ 38.3</u>	<u>\$ 11.9</u>

LIBERTY GLOBAL PLC
SCHEDULE II
VALUATION AND QUALIFYING ACCOUNTS

Allowance for doubtful accounts — Trade receivables

	Balance at beginning of period	Impact of the adoption of ASU 2014-09	Additions to costs and expenses	Acquisitions	Dispositions	Deductions or write-offs	Foreign currency translation adjustments	Balance at end of period
	in millions							
Year ended December 31:								
2019	\$ 44.4	—	43.4	—	—	(46.8)	0.7	\$ 41.7
2020	\$ 41.7	1.4	81.8	19.4	(26.2)	(73.6)	3.8	\$ 48.3
2021	\$ 48.3	—	16.3	(1.6)	—	(18.5)	(2.5)	\$ 42.0

Allowance for doubtful accounts — Loans to affiliates

	Balance at beginning of period	Impact of the adoption of ASU 2016-13	Additions to costs and expenses	Foreign currency translation adjustments	Balance at end of period
	in millions				
Year ended December 31:					
2020	\$ —	25.4	10.3	2.8	\$ 38.5
2021	\$ 38.5	—	1.0	(2.3)	\$ 37.2

Liberty Global plc Subsidiaries
December 31, 2021

Name	Country
Liberty Global Swiss Services GmbH	Austria
Connectify NV	Belgium
Décor Oyenbrug BV	Belgium
Doccle BV	Belgium
Doccle.Up NV	Belgium
Loft International BV	Belgium
MaRo NV	Belgium
Native Nation BV	Belgium
SBS Belgium NV	Belgium
Telenet BV	Belgium
Telenet Group Holding N.V.	Belgium
Telenet Group NV/SA	Belgium
Telenet Retail BV	Belgium
Telenet Vlaanderen NV	Belgium
The Park Entertainment NV	Belgium
Ucast BV	Belgium
Woestijnvis NV	Belgium
Liberty Global Smart Sourcing GmbH	Germany
Liberty Networks Germany GmbH	Germany
Unitymedia Finanz-Service GmbH	Germany
Casey Cablevision Limited	Ireland
Channel 6 Broadcasting Limited	Ireland
Cullen Broadcasting Limited	Ireland
Kish Media Limited	Ireland
P.B.N. Holdings Ltd	Ireland
Tullamore Beta Limited	Ireland
TVThree Enterprises Limited	Ireland
TVThree Sales Limited	Ireland
Ulana Business Management Ltd	Ireland
Virgin Media Ireland Limited	Ireland
Virgin Media Television Limited	Ireland
VMIE Group Holdings Limited	Ireland
Liberty Global Luxembourg Sàrl	Luxembourg
Liberty Property Holdco I Sàrl	Luxembourg
Mobile Challenger Intermediate Group SA	Luxembourg
Sunrise Communications Holdings SA	Luxembourg
Telenet Finance Luxembourg Notes Sàrl	Luxembourg

Name	Country
Telenet International Finance Sàrl	Luxembourg
Telenet Luxembourg Finance Center Sàrl	Luxembourg
<i>Telenet Solutions Luxembourg NV</i>	<i>Luxembourg</i>
Liberty Global Holding Company Limited	Malta
Liberty Global Insurance Company Limited	Malta
Binan Investments B.V.	Netherlands
Labesa Holding B.V.	Netherlands
LGCI Holdco I BV	Netherlands
LGI Ventures B.V.	Netherlands
Liberty Global B.V.	Netherlands
Liberty Global Communication Services BV	Netherlands
Liberty Global Content Investments BV	Netherlands
Liberty Global Corporate BV	Netherlands
Liberty Global Europe Financing B.V.	Netherlands
Liberty Global Europe HoldCo 2 B.V.	Netherlands
Liberty Global Europe Holding B.V.	Netherlands
<i>Liberty Global Europe Holding III B.V.</i>	<i>Netherlands</i>
Liberty Global Europe Management B.V.	Netherlands
Liberty Global Holding B.V.	Netherlands
Liberty Global Switzerland HoldCo BV	Netherlands
Liberty Global Technology Services BV	Netherlands
Liberty Global Ventures Group Holding BV	Netherlands
Liberty Global Ventures Holding BV	Netherlands
Liberty Global Ventures Holding II BV	Netherlands
Liberty Networks Europe Holding BV	Netherlands
NewCo I BV	Netherlands
The Park Entertainment B.V.	Netherlands
UPC Broadband Finco B.V.	Netherlands
UPC Broadband Holding B.V.	Netherlands
UPC Holding B.V.	Netherlands
UPC Holding II B.V.	Netherlands
UPC Poland Holding B.V.	Netherlands
UPC Slovakia Group Holding BV	Netherlands
UPC Slovakia Holding I BV	Netherlands
<i>UPC Slovakia Holding II BV</i>	<i>Netherlands</i>
UPC Switzerland Holding BV	Netherlands
UPC Polska Holdco III Sp Zoo	Poland
UPC Polska Sp. z o.o	Poland
Sunrise Portugal S.A.	Portugal
UPC Broadband Slovakia sro	Slovak Republic
ello communications SA	Switzerland

Name	Country
ITV Betriebsgesellschaft GmbH	Switzerland
Sitel SA	Switzerland
Sunrise UPC GmbH	Switzerland
Swiss Open Fiber AG	Switzerland
TELDAS GmbH	Switzerland
Teledistal SA	Switzerland
Telelavaux SA	Switzerland
Catalyst NewCo 1 Limited	UK-England & Wales
Catalyst NewCo 3 Limited	UK-England & Wales
Global Handset Finco Ltd	UK-England & Wales
LGCI Holdings Limited	UK-England & Wales
Liberty Global Broadband Germany Holding II Limited	UK-England & Wales
Liberty Global Broadband Germany Holding Limited	UK-England & Wales
Liberty Global Broadband Holding Limited	UK-England & Wales
Liberty Global Broadband I Limited	UK-England & Wales
Liberty Global Broadband II Limited	UK-England & Wales
Liberty Global Capital Limited	UK-England & Wales
Liberty Global Development Limited	UK-England & Wales
Liberty Global Europe 2 Limited	UK-England & Wales
Liberty Global Europe Limited	UK-England & Wales
Liberty Global Finance I (UK) Limited	UK-England & Wales
Liberty Global Finance II (UK) Limited	UK-England & Wales
Liberty Global Management Services Limited	UK-England & Wales
Liberty Global plc	UK-England & Wales
Liberty Global SSC Limited	UK-England & Wales
Liberty Global Technology Limited	UK-England & Wales
Liberty Global Ventures Group Limited	UK-England & Wales
Liberty Global Ventures Holding Limited	UK-England & Wales
Liberty Global Ventures Limited	UK-England & Wales
Liberty Infrastructure Real Estate HoldCo Limited	UK-England & Wales
Newco Holdco 6 Limited	UK-England & Wales
Phoenix Renewables Ltd	UK-England & Wales
The Park Playground UK Limited	UK-England & Wales
LGI Technology Holdings Inc.	USA-Colorado
Liberty Global Management, LLC	USA-Colorado
Liberty Global Services, LLC	USA-Colorado
UIM Aircraft, LLC	USA-Colorado
Associated SMR, Inc.	USA-Delaware
LGCI HoldCo LP	USA-Delaware
LGI International LLC	USA-Delaware
LGI Ventures Management, Inc.	USA-Delaware

Name	Country
Liberty Global Holdings Inc.	USA-Delaware
Liberty Global, Inc.	USA-Delaware
Liberty Programming Japan, LLC	USA-Delaware
NewCo Financing Partnership	USA-Delaware
Telenor Financing USD LLC	USA-Delaware
The Park Entertainment, Inc.	USA-Delaware
UnitedGlobalCom LLC	USA-Delaware
UPC Financing Partnership	USA-Delaware
VMIE Financing LLC	USA-Delaware

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Liberty Global plc:

We consent to the incorporation by reference in the registration statements (No. 333-189220, 333-189222, 333-189223, 333-189224, 333-194578, 333-194581, 333-205542, 333-205543, and 333-254168) on Form S-8 of Liberty Global plc of our reports dated February 17, 2022, with respect to the consolidated balance sheets of Liberty Global plc as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive earnings, equity, and cash flows for each of the years in the three-year period ended December 31, 2021, and the related notes and financial statement schedules I and II, and the effectiveness of internal control over financial reporting as of December 31, 2021, which reports appear in the December 31, 2021 annual report on Form 10-K of Liberty Global plc.

/s/ KPMG LLP

Denver, Colorado
February 17, 2022

CERTIFICATION

I, Michael T. Fries, certify that:

1. I have reviewed this annual report on Form 10-K of Liberty Global plc;
2. Based on my knowledge, this annual 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 annual report;
3. Based on my knowledge, the financial statements, and other financial information included in this annual 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 annual report; 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 we 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 annual 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 annual report our conclusions about the effectiveness of the disclosure controls and procedures as of the end of the period covered by this annual report based on such evaluation; and
 - d) Disclosed in this annual 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 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 function):
 - 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.

Date: February 17, 2022

/s/ Michael T. Fries

Michael T. Fries
President and Chief Executive Officer

CERTIFICATION

I, Charles H.R. Bracken, certify that:

1. I have reviewed this annual report on Form 10-K of Liberty Global plc;
2. Based on my knowledge, this annual 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 annual report;
3. Based on my knowledge, the financial statements, and other financial information included in this annual 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 annual report; 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 we 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 annual 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 annual report our conclusions about the effectiveness of the disclosure controls and procedures as of the end of the period covered by this annual report based on such evaluation; and
 - d) Disclosed in this annual 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 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 function):
 - 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.

Date: February 17, 2022

/s/ Charles H.R. Bracken

Charles H.R. Bracken

Executive Vice President and Chief Financial Officer

Certification
Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
(Subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code)

Pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code), each of the undersigned officers of Liberty Global plc (the "Company"), does hereby certify, to such officer's knowledge, that:

The Annual Report on Form 10-K for the year ended December 31, 2021 (the "Form 10-K") of the Company fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 and information contained in the Form 10-K fairly presents, in all material respects, the financial condition and results of operations of the Company as of December 31, 2021 and December 31, 2020, and for the years ended December 31, 2021, 2020 and 2019.

Dated: February 17, 2022

/s/ Michael T. Fries

Michael T. Fries

President and Chief Executive Officer

Dated: February 17, 2022

/s/ Charles H.R. Bracken

Charles H.R. Bracken

Executive Vice President and Chief Financial Officer

The foregoing certification is being furnished solely pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code) and is not being filed as part of the Form 10-K or as a separate disclosure document.