**UNITED STATES SECURITIES AND EXCHANGE COMMISSION**
**WASHINGTON, D.C. 20549**

# Form 10-K/A

**(As Amended by Amendment No. 1)**

☑ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
**For the fiscal year ended December 31, 2020**

**OR**

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF**
**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** | **98-1112770** |
| *(State or other jurisdiction of incorporation or organization)* | *(I.R.S. Employer Identification No.)* |
| **Griffin House**<br>**161 Hammersmith Rd**<br>**London**<br>**United Kingdom** | **W6 8BS** |
| *(Address of principal executive offices)* | *(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: $12.3 billion.

The number of outstanding ordinary shares of Liberty Global plc as of January 31, 2021 was: 181,355,249 shares of class A ordinary shares, 12,561,444 shares of class B ordinary shares and 383,495,825 shares of class C ordinary shares.

**DOCUMENTS INCORPORATED BY REFERENCE**

Portions of the definitive proxy statement for the Registrant's 2021 Annual General Meeting of Shareholders are incorporated by reference in Part III of this Form 10-K.

** This copy of our 2020 Annual Report on Form 10-K/A omits certain items. See Table of Contents for additional information**

**LIBERTY GLOBAL PLC**

**2020 ANNUAL REPORT ON FORM 10-K/A**

**TABLE OF CONTENTS**



* This copy of our 2020 Annual Report on Form 10-K/A omits the exhibits and financial statement schedules that are included in Part IV of our complete Annual Report, as filed with the Securities and Exchange Commission on February 16, 2021 and amended on March 30, 2021. A complete copy of our 2020 Annual Report on Form 10-K/A that includes the omitted items, other than the exhibits, is available upon request.

## 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 services company. We are focused on building a strong convergence of fixed and mobile communication opportunities, 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 customers subscribing to 49.3 million (at December 31, 2020) 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 (defined below). We also have significant investments in ITV plc, Skillz Inc., All3Media Group, Univision Holdings Inc., CANAL+ Polska S.A. (formerly known as ITI Neovision S.A.), EdgeConneX Inc., Lions Gate Entertainment Corp, the Formula E racing series and several regional sports networks.

Primary Business Operations:

| Brand | Entity | Location | Ownership(1) |
|---|---|---|---|
| Virgin media | Virgin Media | United Kingdom & Ireland | 100.0% |
|  | Telenet | Belgium | 60.7% |
| Sunrise upc (2) | UPC Switzerland<br>Sunrise | Switzerland | UPC Switzerland 100%<br>Sunrise 98.9% |
| upc | UPC Poland | Poland | 100.0% |
| upc | UPC Slovakia | Slovakia | 100.0% |
| vodafone ziggo | VodafoneZiggo | Netherlands | 50.0% |

(1) As of December 31, 2020.

(2) UPC Switzerland and Sunrise are referred to throughout the document as Sunrise UPC; however the two entities are currently operating independently until the statutory "squeeze-out" procedure under Swiss law is completed and the entities can fully integrate. For more information see *General Development of Business - Expansion and Acquisition* discussion below and note 5 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. Unless otherwise indicated, convenience translations into United States (**U.S.**) dollars are calculated as of December 31, 2020, and operational data, including subscriber statistics and ownership percentages, are as of December 31, 2020.

### *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 focus on markets where we have focused on creating national champion converged businesses in core markets and to unlock significant synergies. 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**). As of December 31, 2020, Liberty Global holds 98.9% of the share capital of Sunrise and has initiated a statutory "squeeze-out" procedure according to applicable Swiss law pursuant to which we will acquire the remaining Sunrise Shares that we do not yet own. This "squeeze-out" procedure is expected to be completed during the first half of 2021.
- 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.
- On May 16, 2016, we acquired Cable & Wireless Communications Limited (**C&W**), a provider of telecommunication services, including mobile and high-speed broadband, focused in Latin America and the Caribbean. In connection with the Split-off Transaction referenced below under *—Dispositions*, we have since transferred C&W to Liberty Latin America Ltd. (**Liberty Latin America**).
- On February 11, 2016, Telenet acquired BASE Company N.V. (**BASE**), the third-largest mobile network operator in Belgium.

For additional information on our acquisitions see note 5 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K. In addition, we have completed various other smaller acquisitions in the normal course of business.

We have 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 have agreed to provide certain transitional services to M7 for a period of up to two years. These services principally comprise 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 to holders of our then LiLAC ordinary 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.

- On December 31, 2016, our company and Vodafone contributed our respective operations in the Netherlands to VodafoneZiggo Group Holding B.V., a 50:50 joint venture (referred to herein as the **VodafoneZiggo JV**). We treat the VodafoneZiggo JV as an equity investment.

For additional information on our more recent dispositions, see note 6 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K. We have also completed various other smaller dispositions in the normal course of business and as required by regulatory authorities in connection with approving certain of our acquisitions. 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 the Company determines to move forward with any re-domicile transaction, we would seek shareholder approval in advance.

*Pending Transactions*

On May 7, 2020, we entered into a Contribution Agreement (the **Contribution Agreement**) with, among others, Telefonica SA (**Telefónica**). Pursuant to the Contribution Agreement, Liberty Global and Telefónica agreed to form a 50:50 joint venture (the **U.K. JV**), which will combine Virgin Media's operations in the U.K. along with certain other Liberty Global subsidiaries created as a result of the pending U.K. JV (together, the **U.K. JV Entities**) with Telefónica's mobile business in the U.K. to create a nationwide integrated communications provider.

The consummation of the transaction contemplated by the Contribution Agreement is subject to certain conditions, including competition clearance by the applicable regulatory authorities. The Contribution Agreement also includes customary termination rights, including a right of the parties to terminate the agreement if the transaction has not closed within 24 months following the date of the Contribution Agreement, which may be extended by six months under certain circumstances.

*Network Expansion and Upgrades*

We have expanded our broadband footprint through new build projects and strategically selected acquisitions. Our new build projects consist of network extension programs pursuant to which we connect additional homes and businesses to our broadband communications network (**Network Extensions**). Our investment in Network Extensions is critical not only for our business to grow, but also for the countries and communities in which we operate. The Network Extensions, together with upgrades to our existing networks and next generation customer premises equipment, provide our customers the means to enter the gigaworld society. During 2020, through our Network Extensions, we connected approximately 561,000 additional residential and commercial premises (excluding upgrades) to our networks, including approximately 426,000 residential and commercial premises connected by Virgin Media in the United Kingdom (**U.K.**), and Ireland. We expect to continue the Network Extensions in 2021. Depending on a variety of factors, however, including the financial and operations results of our new build programs, the Network Extensions may be continued, modified or cancelled at our discretion.

*Equity Transactions*

Share repurchases are an important part of our strategy in returning value to our shareholders. Pursuant to our share repurchase programs authorized by our board of directors, we have repurchased a significant amount of our shares since our inception in 2005. During 2020, our share repurchases were:

| Title of shares | Number of shares | Average price paid per share[(1)] | Aggregate purchase price[(1)] |
|---|---|---|---|
| | | | in millions |
| Class A ordinary shares | 1,309,000 | $ 22.38 | $ 29.4 |
| Class C ordinary shares | 54,473,323 | $ 19.15 | $ 1,043.2 |

(1) Amounts include direct acquisition costs.

At December 31, 2020, the remaining amount authorized for share repurchases was $1.0 billion. 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 (including with respect to Network Extensions), 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 recent outbreak 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 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 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 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 cable television, broadband internet, 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;
- our ability to maintain or increase the number of subscriptions to our cable television, broadband internet, 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 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 of the U.K.'s departure from the 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 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, including the costs and benefits associated with the planned Network Extensions;
- the availability of capital for the acquisition and/or development of telecommunications networks and services;
- problems we may discover post-closing with the operations, including the internal controls and financial reporting process, of businesses we acquire;
- 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 equity capital structure; 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 VodafoneZiggo JV and Sunrise UPC deliver mobile services as mobile network operators, and Virgin Media, UPC Poland and UPC Slovakia deliver mobile services as MVNOs through third-party networks. Sunrise UPC also delivers mobile services as a MVNO pursuant to a legacy contract prior to 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 the U.K. and Ireland through Virgin Media, Belgium through Telenet, Switzerland through Sunrise UPC, Poland through UPC Poland and Slovakia through UPC Slovakia. In terms of video subscribers, we operate the largest cable network in each of these countries, except in Poland, where we operate the second largest cable network. We also have investments in the VodafoneZiggo JV, which operates the largest cable network in the Netherlands, and in various content businesses.

A breakdown of our revenue by major category for our consolidated reportable segments appears in note 20 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. In 2019 we continued to improve our operations to meet our new 2030 and 2050 science-based targets in line with the Paris Climate Accord. In fact, we were 40 times more carbon efficient compared to 2012. We also avoided more than 11,000 metric tons of carbon emissions and 2,500 metric tons of 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, VodafoneZiggo, Telenet and UPC Poland have all pursued gender diversity as strategic goals, 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 and sexual orientation.

**Liberty Global Statistics**

The following tables present certain operating data as of December 31, 2020, with respect to the networks of our consolidated subsidiaries. The following tables reflect 100% of the data applicable to each of our subsidiaries regardless of our ownership percentage.

**Consolidated Operating Data - December 31, 2020**

| | | | | | Video | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Homes Passed (1) | Fixed-Line Customer Relationships (2) | Total RGUs (3) | Internet Subscribers (4) | Basic Video Subscribers (5) | Enhanced Video Subscribers (6) | Total Video | Telephony Subscribers (7) | Mobile Subscribers (8) |
| United Kingdom | 15,310,800 | 5,626,700 | 13,381,300 | 5,420,100 | — | 3,498,000 | 3,498,000 | 4,463,200 | 3,358,300 |
| Belgium | 3,373,000 | 2,048,100 | 4,680,600 | 1,697,100 | 123,700 | 1,688,000 | 1,811,700 | 1,171,800 | 2,815,700 |
| Switzerland (9) | 2,406,300 | 1,477,400 | 3,367,900 | 1,135,800 | 342,000 | 893,500 | 1,235,500 | 996,600 | 2,181,300 |
| Ireland | 946,500 | 435,200 | 992,500 | 383,000 | — | 309,500 | 309,500 | 300,000 | 119,600 |
| Poland | 3,635,200 | 1,525,000 | 3,267,500 | 1,289,700 | 255,000 | 1,079,800 | 1,334,800 | 643,000 | 62,700 |
| Slovakia | 624,300 | 190,600 | 403,800 | 144,000 | 31,200 | 139,700 | 170,900 | 88,900 | — |
| Total Liberty Global | 26,296,100 | 11,303,000 | 26,093,600 | 10,069,700 | 751,900 | 7,608,500 | 8,360,400 | 7,663,500 | 8,537,600 |
| VodafoneZiggo JV (10) | 7,298,700 | 3,836,300 | 9,467,600 | 3,363,500 | 504,900 | 3,326,400 | 3,831,300 | 2,272,800 | 5,189,800 |

(1) 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.

(2) 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.

(3) RGU is separately a Basic Video Subscriber, Enhanced Video Subscriber, Internet Subscriber or Telephony Subscriber (each as defined and described below). A home, residential multiple dwelling unit, or commercial unit may contain one or more RGUs. For example, if a residential customer in our U.K. market subscribed to our enhanced video service, fixed-line telephony service and broadband internet service, the customer would constitute three RGUs. Total RGUs is the sum of Basic Video, Enhanced Video, Internet and Telephony Subscribers. RGUs generally are counted on a unique premises basis such that a given premises 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.

(4) Internet Subscriber is a home, residential multiple dwelling unit or commercial unit that receives internet services over our networks, or that we service through a partner network. In Switzerland, we offer a 10 Mbps internet service to our Basic and Enhanced Video Subscribers without an incremental recurring fee. Our Internet Subscribers in Switzerland include 51,500 subscribers who have requested and received this service.

(5) Basic Video Subscriber is a home, residential multiple dwelling unit or commercial unit that receives our video service over our broadband network or through a partner network either via an analog video signal or via a digital video signal without subscribing to any recurring monthly service that requires the use of encryption-enabling technology. Encryption-enabling technology includes smart cards, or other integrated or virtual technologies that we use to provide our enhanced service offerings. We count RGUs on a unique premises basis. In other words, a subscriber with multiple outlets in one premises is counted as one RGU and a subscriber with two homes and a subscription to our video service at each home is counted as two RGUs. We have approximately 30,600 "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.

(6) Enhanced Video Subscriber is a home, residential multiple dwelling unit or commercial unit that receives our video service over our broadband network or through a partner network via a digital video signal while subscribing to any recurring monthly service that requires the use of encryption-enabling technology. Enhanced Video Subscribers are counted on a unique premises basis. For example, a subscriber with one or more set-top boxes that receives our video service in one premises is generally counted as just one subscriber. An Enhanced Video Subscriber is not counted as a Basic Video Subscriber. As we migrate customers from basic to enhanced video services, we report a decrease in our Basic Video Subscribers equal to the increase in our Enhanced Video Subscribers. Subscribers to enhanced video services provided by our operations in Switzerland over partner networks largely receive basic video services from the partner networks as opposed to our operations.

(7) Telephony Subscriber is a home, residential multiple dwelling unit or commercial unit that receives 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 Basic and Enhanced Video Subscribers without an incremental recurring fee. Our Telephony Subscribers in Switzerland include 202,800 subscribers who have requested and received this service.

(8) 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 counts 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, 2020, our mobile subscriber count included 475,900, 381,800 and 134,400 prepaid Mobile Subscribers in Switzerland, Belgium and the U.K., respectively.

(9) 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, 2020, Switzerland's partner networks accounted for 118,100 Fixed-Line Customer Relationships, 300,800 RGUs, which include 110,000 Internet Subscribers, 105,100 Video Subscribers and 85,700 Telephony Subscribers.

Subscribers to our enhanced video services provided over partner networks largely receive basic 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 657,300 homes passed by Switzerland's partner networks at December 31, 2020. 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.

(10) Amounts related to the VodafoneZiggo JV's fixed-line and mobile products include small business and multiple dwelling unit subscribers. In addition, the mobile amount shown for the VodafoneZiggo JV's includes medium and large enterprise subscribers. Prepaid mobile customers are excluded from the VodafoneZiggo JV's mobile telephony subscriber counts after a period of inactivity of nine 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**" built on top of our fiber-rich fixed broadband network and recently expanded mobile network. The Connectivity Ecosystem 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 Connectivity 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. 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. The full suite of the Connectivity Ecosystem is live in our U.K. and Switzerland markets, and we intend to expand availability in select markets during the first quarter of 2021.

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 Connect Box is available in all our markets, and currently, approximately 10 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. In Belgium, Switzerland and the U.K., we also offer our Connect App that, among other things, allows our customers to find their best WiFi access. In addition, we provide intelligent WiFi boosters, which increase speed, reliability and coverage by adapting to the environment at home. We also brought to market and are looking to expand the availability of our new Gigabit Connect Box based on DOCSIS 3.1 technology that provides even better in-home WiFi service to customers.

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 14 million homes across our footprint. In 2020, our networks continued to be recognized, with Virgin Media U.K. being awarded Fastest Broadband Provider in the U.K. and the VodafoneZiggo JV winning the Best Internet Provider award in the Netherlands for the tenth year in a row.

The speed of service depends on the location and the tier of service selected. By leveraging our existing fiber-rich broadband networks and our Network Extensions, 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, it allows for 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.

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 or analog video channels (including a limited 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. In the markets where we encrypt our basic digital service, our digital service is generally offered at an incremental cost equal to or slightly higher than the monthly fee for our basic analog service. 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, 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 video apps and mobile viewing into one entertainment experience. Horizon 4 comes with a state of the art 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 (NPS) figures. Horizon 4 is marketed under the name "Telenet TV-Box" in Belgium, "UPC TV" in Switzerland, "Virgin TV360" in the U.K. 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 they will be flashed with the 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 our U.K. 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 our U.K. customers without the need of exchanging the installed hardware.

One of our key video services is "**Replay TV**". Through Replay TV, the last seven days of content 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. Replay TV 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. 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 our enhanced 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, NBCU/Universal, CBS/Paramount, Warner and Sony, among others. In addition, in many of our markets we offer premium over the top (**OTT**) services like Netflix and Amazon Prime Video via certain 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, Android and Windows) and, in some market places, 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 dongle-like form factor that can be tucked away behind a TV screen. This all-IP TV box has extremely low power consumption, and its casing is made from recycled plastic, proudly winning us Digital TV Europe's Video Tech Innovation Sustainability Award in December 2020. We intend to roll out the all-IP TV box to additional markets in 2021 and beyond.

*Mobile Services*

Mobile services are another key building block for us to provide customers with seamless connectivity. Virgin Media and UPC Poland offer mobile services as MVNOs over third-party networks, and Telenet, the VodafoneZiggo JV and UPC Sunrise offer mobile services as mobile network providers.

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. These arrangements permit 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. | BT / EE[(1)] |
| Switzerland | Swisscom[(2)] |
| Ireland | Three (Hutchison) |
| Poland | Orange/Play |

(1) Our U.K. operations agreed to a new MVNO agreement with Vodafone U.K. in November 2019, however, the MVNO arrangement with EE will continue until the end of 2021 by which time the full migration to the Vodafone U.K. network is expected to be complete.

(2) Our Switzerland operations completed migration to the Swisscom network in the beginning of 2019, and also have the right to access the Sunrise network as a mobile network operator.

Where mobile services are available, subscribers pay varying monthly fees depending on whether the mobile service is combined with our cable services or includes mobile data services via mobile phones, tablets or laptops. We offer our customers the option to purchase mobile handsets and, in most of our markets, make such purchase pursuant to a contract independent of their mobile services contract. We refer to these arrangements as split contracts. In Belgium, for those subscribers on Telenet's own network, it is offering more flexible bundles adjusted to customers' needs so they can use the full capacity of their package, regardless of their appetite to use either more data, minutes or text messages. As a mobile network provider, Telenet also has agreements with other mobile providers to use its mobile network for their mobile offerings.

Our mobile services typically include voice, short message service (or **SMS**) and internet access. Calls, both within and out of network, incur a charge or are covered under a postpaid monthly service plan. Our mobile services are primarily on a postpaid basis with customers subscribing to services for periods ranging from activation for a SIM-only contract to up to 24 months (or 36 months in the U.K.), with the latter often taken with a subsidized mobile handset. In Belgium and Switzerland, however, our postpaid service is offered without a minimum contract term. In the U.K. and Belgium, we also offer a prepaid service, where the customers pay in advance for a pre-determined amount of airtime or data and generally have no minimum contract term. In almost all of our markets, subscribers to a double- or triple-play bundle receive a discount on their mobile service fee.

*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., we also provide 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 basic and enhanced 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 19 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, enhanced 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; 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—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 process, 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, 2020, the VodafoneZiggo JV had 9.5 million RGUs, of which 3.8 million were video, 3.4 million were broadband internet and 2.3 million were fixed-line telephony. In addition, the VodafoneZiggo JV had 5.2 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—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, 500 Mbps nationwide broadband internet to residential customers, 600 Mbps broadband internet to business customers and an extensive WiFi community network. The VodafoneZiggo JV also has its own sports channel, Ziggo Sport, and offers exclusive programming, such as HBO. Additionally, as of December 2020, the VodafoneZiggo JV has made 1 Gbps broadband internet available in 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, and recently acquired new spectrum licenses in the 700 MHz and 1400 MHz band, and renewed its license in the 2100 MHz band during the multiband auction in July 2020. With its mobile services, the VodafoneZiggo JV is able to offer quad-play bundles and converged services to its residential and business customers.

For all its services, the VodafoneZiggo JV competes primarily with the provision of similar services from the incumbent telecommunications operator Koninklijke KPN N.V. (**KPN**). KPN offers (1) internet protocol television (**IPTV**) over fiber optic lines where the fiber is to the home, cabinet, or building or to the node networks (fiber-to-the-home/-cabinet/-building/-node is referred to herein as **FTTx**) and through broadband internet connections using digital subscriber lines (**DSL**) or very high-speed DSL technology (**VDSL**) or an enhancement to VDSL called "vectoring", (2) digital terrestrial television (**DTT**), and (3) LTE services. 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. Its ability to offer a bundled triple-play of broadband internet, video and telephony services and fixed-mobile convergence services creates competitive pressure on the VodafoneZiggo JV's operations, including the pricing and bundling of its video products. KPN's video services include many of the interactive features that the VodafoneZiggo JV offers its subscribers, including pausing live TV, replay and third party apps. Portions of the VodafoneZiggo JV's network have been overbuilt by KPN's and other providers' FTTx networks and expansion of these networks is expected to continue. Another significant competitor is the Netherlands operations of Deutsche Telekom.

## Additional Business Information

*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 under *General Development of Business—Expansion and Acquisitions* above, we are expanding our HFC and FTTH footprint through our Network Extensions. 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 launched our next generation gateways that will enable 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, we are looking beyond our currently deployed technologies to DOCSIS 4.0 and FTTH / XGS-PON, which will enable 10 Gbps and beyond.

*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 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 (often with minimum guarantees) and 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, our primary focus is on partnering with leading international providers, such as Disney/Fox, Warner Media (including HBO), NBCUniversal, 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 programing through select relationships with companies such as Sky plc (**Sky**) (U.K. and Ireland) and BT Group plc (**BT**). For our VoD services, we license a variety of programming, including box sets of television series, movies, music, kids' programming and documentaries. In addition, 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 our customers in the U.K., 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. and Ireland.

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, STX, 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, *MySports* in Switzerland, which Sunrise UPC licenses to other platforms in Switzerland, and *VMSports* in Ireland. Also, the VodafoneZiggo JV owns *Ziggo Sport*. 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., which we own jointly with Discovery, Inc., 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, with at least two or more suppliers providing our high-volume products. 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 TiVo service in the U.K., we have a partnership arrangement where TiVo is the provider of the user interface software for our next generation set-top boxes, which provides converged television and broadband internet capabilities. In 2017, we entered into a multi-year extension of our agreements with TiVo. 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 advances and product innovations is likely to continue to increase, giving customers many 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 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 or network. Where mobile is available, our networks, together with our deep fiber access, allow us to provide a comprehensive set of converged mobile and fixed-line services. 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 given that business demand peaks at a time when consumer demand is low, and peaks at lower levels than consumer demand.

Overall, we are experiencing increased convergence as customers look to receive all their media and communication services from one provider. In our largest video markets, our key competitors are: BT (U.K.), Proximus NV/SA (**Proximus)** (Belgium) and Swisscom (Switzerland). Also, as described above under *Products and Services—Investments—VodafoneZiggo JV*, the key competitor for the VodafoneZiggo JV is KPN. Each of these competitors have extensive resources allowing them to offer competitively priced bundled services. As a result, our ability to offer 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***

With respect to broadband internet services and online content, our businesses face competition in a rapidly evolving marketplace from incumbent and non-incumbent telecommunications companies, mobile operators and cable-based ISPs, many of which have substantial resources. The internet services offered by these competitors include both fixed-line broadband internet via cable, DSL or FTTx networks and wireless broadband. These competitors have a range of product offerings with varying speeds and pricing, as well as interactive services, data and other non-video 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 drivers 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 smart in-home connectivity solutions. We update our bundles and packages on an ongoing basis to meet the needs of our customers. Our ultra high download speed of 1Gbps is available in all of Belgium, Switzerland and substantially all of Ireland, as well as large parts of the U.K., Poland and Slovakia. We use our competitively priced ultra high-speed internet services with access to Community WiFi 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 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 substantially overbuilt; however certain FTTx providers have announced upgrade plans that might indicate increased competition in the future. It is unclear if announced plans will be realized due to significant operational and financial challenges in rolling out FTTx. 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 to take wholesale access and expand our geographical coverage.

We are expanding our ultra high-speed services and increasing our download speeds. In most of our markets, we offer our internet service on a standalone basis or through bundled offerings that include video, fixed-line telephony and mobile services. Mobile data is also increasingly important and we are addressing this through our mobile products and active expansion of the up to date wireless technology, including 5G.

- Virgin Media. In the U.K., we have a number of significant competitors in the market for broadband internet services, including fixed-line incumbent telecommunications providers. Of these broadband internet providers, BT is the largest, which provides broadband internet access services to both its own retail customers and third-party retail providers. BT has refocused its efforts to rollout a FTTx service supporting 1 Gbps speed to four million homes and businesses by March 2021 with the current plans to build FTTx in 107 locations, and a target to cover 20 million homes by 2030. As a result of these objectives, BT has launched a range of ultrafast consumer packages offering speeds of up to 900 Mbps.

  Operators such as Sky and TalkTalk deploy their own network access equipment in BT exchanges via a process known as local loop unbundling (**LLU**). This allows an operator to reduce the recurring operating costs charged by BT by reducing the proportion of traffic that must travel directly over BT's network. LLU deployment requires a substantial capital investment to implement and requires a large customer base to deliver a return on investment. In addition, we currently see limited competition from mobile broadband developments, such as LTE and 5G mobile services and WiFi services.

- 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 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. In this competitive market, Telenet is using its fixed-mobile converged offers to promote its services.

- 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 roll out G.fast technology. Swisscom offers download speeds ranging from up to 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. It has built its FTTx network in several cities in cooperation with municipality-owned utility companies and, where no cooperation agreement has been reached, Swisscom is building its own FTTx network. 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 increased its introductory speed to 100 Mbps in line with market dynamics, is promoting its broadband services through its bundled offers and introduced a 1 Gbps service across its footprint. Moreover, the recent acquisition of Sunrise opens up vast opportunities to generate market synergies and further enhance Sunrise UPC's competitive edge. Sunrise is a predominantly mobile player also focused on fixed-mobile convergence. To that end, Sunrise has looked to increase its FTTx network via fixed access agreements with Swisscom and utility fiber networks and its own fixed wireless access technologies. 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.

### *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 and RTL). To enhance 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. Other competitors have obtained long-term exclusive contracts for programs, but 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. For instance, Sky obtained significant competitive advantage through its deal to carry Disney on Sky's set-top box. 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 3rd 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. Similarly, VDSL, which is either provided directly by the owner of the network or by a third-party, is a significant part of the competitive environment in many of our markets, as are FTTx networks. In all of our markets, competitive video services are offered by the incumbent telecommunications operator, whose strategies include video services over DSL, VDSL and FTTx networks and, in some cases, DTH and 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.

- Virgin Media. Virgin Media's digital television services compete primarily with FTA television and with Sky, the primary pay satellite television provider. Sky offers competitively priced triple-play and quad-play services in the U.K. and Ireland. Other significant competitors are BT and TalkTalk Telecom Group plc (**TalkTalk**) in the U.K. and Eircom Limited in Ireland, each of which offer triple-play services, as well as IPTV video services. Each of these competitors have multimedia home gateways.

  Sky owns the U.K. rights to various entertainment, sports and movie programming content and channels. Sky is both a principal competitor in the pay-television market 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.

Virgin Media 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.

In this competitive market, Virgin Media is expanding its broadband network and promotes its 4K and HDR ready boxes running on its latest Horizon 4 platform (marketed as "Virgin TV360") in the U.K. and in Ireland. The on-line streaming service Virgin TV Go is available throughout the Virgin Media footprint. Virgin Media customers also have access to third-party apps (e.g. Netflix, Amazon Prime Video and YouTube). In addition, Virgin Media's ability to include mobile for its U.K. and Ireland customers for a low incremental fee creating a fixed-mobile convergence bundle is a key market offer.

- 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 (e.g. *Chaussée d'Amour* and *De Dag*) 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, Telenet continues to enhance its Yelo Play and Horizon Go apps as well as programming and the addition of sports rights.

- 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 and YouTube). Sunrise UPC uses its high-speed internet service with speeds of up to 1 Gbps to promote its extended digital bundles and offer mobile services. The recent acquisition of Sunrise is expected to further strengthen Sunrise UPC's position in the national video market. 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.

***Mobile and Telephony Services***

In Belgium, as a mobile network operator, we are one of the larger mobile providers based on number of SIM cards. We also substantially expanded our mobile business with the acquisition of Sunrise in Switzerland and new MVNO arrangements with Vodafone in the U.K. In our other European markets, however, we currently have limited mobile presence. In the markets where we are a large mobile provider, 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 other mobile telephony providers, many of whom offer LTE and 5G services and are making significant advances acquiring customers. In all of our markets competition is intense. 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 our bundled offers with our video and ultra high-speed internet services to gain mobile subscribers. Our ability to offer fixed-mobile convergence services is a key driver.

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. OTT telephony is another competitive factor. In addition, our businesses face competition from other cable telephony providers, FTTx-based providers or other indirect access providers.

Competition in both the residential and business fixed-line telephony markets is extremely competitive due to market trends, the offering of carrier pre-select services, number portability, the replacement of fixed-line with mobile telephony and the growth of VoIP services, as well as continued deregulation of telephony markets and general price competition. Our fixed-line telephony strategy is focused around value leadership, and we position our services as "anytime" or "any destination". Our portfolio of calling plans include a variety of innovative calling options designed to meet the needs of our subscribers. In many of our markets, we provide product innovation, such as telephone apps that allow customers to make and receive calls from their fixed-line call packages and voice over WiFi to allow telephony even with no mobile reception. In addition, we offer varying plans to meet customer needs and, similar to our mobile services, we use our telephony bundle options with our digital video and internet services to help promote our telephony services and flat rate offers are standard.

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 BT (U.K.), 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, 2020, we, including our consolidated subsidiaries, had an aggregate of approximately 23,000 full-time equivalent employees, including approximately 121 in the United States, but excluding contractors and temporary employees. Our purpose – *Tomorrow's Connections Today* – is fundamental to what Liberty Global stands for and represents the shared ambition of our employees, customers and the communities in which we live and operate.

Creating opportunity and value in the dynamic environment we operate in is an important part of how we fulfill our promise that employees can *Grow With Us*. This is underpinned by significant investments in our global people strategy, reaching and enabling approximately 23,000 full-time equivalent employees and the multiple culture building programs led by the office of our CEO. As part of our commitment to helping our people *Grow With Us* and achieve their potential, Liberty Global commits significant ongoing investment to leadership and skills development. Our skills development offerings cover key talent communities within the group - from graduates and apprentices, through people managers, emerging leaders and senior leaders. This approach supports our goal of helping employees achieve their full potential, developing high performing teams and purposeful leaders.

We are united in our resolve to build 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 2020, we refreshed our focus on Diversity, Equity & Inclusion (DE&I) by: defining a new global strategy, appointing our first global Chief DE&I Officer and establishing an executive level DE&I Council. Chaired by our CEO and Chief DE&I Officer and comprising 19 executives representative of our operations, the DE&I Council's role is to spearhead strategic goals and programs in support of realizing our new multi-year DE&I strategy.

Our compensation program plays a key role in promoting our company's operating and financial success and provides incentives for our management team to execute our financial and operational goals. We place great importance on our ability to attract, retain and motivate 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 success of our company, attract and retain the best leaders for our business and align executives' interests to create 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 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 expanded work-from-home plans and increased 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. We also established a $4 million response fund to help employees and their families significantly affected by the crisis. Our executive leadership team and board of directors pledged $2 million to the response fund, which was matched by our company to support our employees in need.

We measure employee engagement on a quarterly basis against external benchmarks defined by an outside organization that provides employee engagement insights to hundreds of the world's leading organizations. We are performing in line with global industry benchmarks, and we exceed benchmarks set by high performing organizations in areas such as in inclusion, well-being, manager support and senior leadership communication. The high performing organization norm is comprised of organizations with strong financial performance and superior human resource practices, representing the gold standard for employee engagement. Results are owned by managers and executives, who are accountable for setting out action plans. In addition, we gather regular qualitative and quantitative insights with methods such as pulse surveys and focus groups. This approach informs decision making across key employee focus areas, including for example, well-being, targeted support during the COVID-19 pandemic, and skills development.

## Regulatory Matters

### *General Overview - E.U., U.K. and Switzerland*

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 European Union (**E.U.**).

Adverse regulatory developments could subject our businesses to a number of risks. Regulation could limit growth, revenue and the number and type of services offered, leading to increased operating costs and property and equipment additions. Moreover, regulation may restrict our operations and subject them to further competitive pressure, including pricing restrictions, interconnect and other access obligations, and restrictions or controls on content. Failure to comply with current or future regulation could expose our businesses to various penalties.

As of February 1, 2021, the E.U. includes 27 Member States; namely, Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden. As such, these countries are required to harmonize certain laws with E.U. rules by transposing directives into their national law. In addition, other types of E.U. rules (or regulations) are directly enforceable in those countries without any implementation at the national level.

The United Kingdom (**U.K.**) formally left the E.U. on January 31, 2020, commonly referred to as "**Brexit**", and entered into a transition period until December 31, 2020. 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**". On December 30, 2020, the E.U.-U.K. Agreement was approved by the U.K. Parliament, with retrospective ratification from the E.U. Parliament expected to follow in 2021. In the meantime, the E.U.-U.K. Agreement has been provisionally brought into effect. The E.U.-U.K. Agreement focuses on four main sectors, namely (1) trade, (2) economic and social cooperation, (3) security and (4) governance. Trade in goods between the E.U. and the U.K. will take place on a zero tariff and zero quota basis. Additionally, even though checks will apply to all traded goods, customs procedures will be simplified. 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 the services sector, the U.K. will no longer benefit from the freedom to supply services across the E.U., and free movement of persons between the E.U. and the U.K. has ended. In addition, the E.U.-U.K. Agreement does not cover audiovisual services. With respect to data movement between the two regions, the E.U. will allow personal data to flow to the U.K. for four months (extendable to six months) without any changes, as it continues its adequacy assessment of the U.K.'s data protection regime, while the U.K. indicated that free flow of data to the E.U. will be allowed. 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. Service providers from either the E.U. or the U.K. will not have to wait for prior authorization before they deliver services. The E.U.-U.K. Agreement contains measures to encourage cooperation on the promotion of fair and transparent rates for international mobile roaming. The effects of Brexit could adversely affect our business, results of operations and financial condition, as more fully detailed in *Item 1A. Risk Factors* included in Part I of this Annual Report on Form 10-K. There can be no assurance that future U.K. policy in this area will remain as favorable to our company as is currently the case.

Regulation in Switzerland, which is not a Member State of the E.U., is discussed separately below, as well as regulations in certain Member States in which we face regulatory issues that may have a material impact on our business.

*E.U. Communications Regulation*

The European Electronic Communications Code (the **Code**) is the primary source of communications regulation in the European Union. The Code came into effect on December 20, 2018 and had to be transposed by the Member States into national law by December 21, 2020. Most Member States are reported to be late with the implementation of the changes that were prescribed by the Code.

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. This description is not intended to be a comprehensive or exhaustive description of all regulation in this area.

- <u>Licensing and Exclusivity</u>. The Code requires Member States to abolish exclusivities on communication networks and services in their territory and allow service providers into their markets based on a simple registration. The Code sets forth an exhaustive list of conditions that may be imposed on communication networks and services. Possible obligations include, among other things, financial charges for universal service or for the costs of regulation, environmental requirements, data privacy and other consumer protection rules, "must carry" obligations, provision of customer information to law enforcement agencies and access obligations.

- <u>Significant Market Power</u>. Specific obligations imposed by National Regulatory Authoritis (**NRAs**) in E.U. Member States apply only to service providers deemed to have Significant Market Power (defined below) in a relevant market. For purposes of the Code, a service provider has "**Significant Market Power**" where, either individually or jointly with others, it enjoys a position of significant economic strength, affording it the power to behave independently of competitors, customers and consumers to an appreciable extent.

  As part of the implementation of certain provisions of the Code, NRAs are required to analyze certain markets predefined by the European Commission to determine if any service provider has Significant Market Power. NRAs may, however, perform analysis of other markets, applying an additional test, called the three criteria test, which looks at the competitiveness of the market during the regulatory period, existence of barriers to market entry and the sufficiency of competition law to deal with market issues.

  In the event that a service provider is found to have Significant Market Power in any particular market, single or jointly with another provider, an NRA could impose certain conditions on that service provider. The European Commission has the power to veto a finding by an NRA of Significant Market Power (or the absence thereof), which power also applies with respect to market definition. The European Commission does not, however, have the power to veto any remedies, such as access obligations, imposed as a result of a finding of Significant Market Power. 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.

- <u>Video Services</u>. The regulation of distribution, but not the content, of television services to the public is harmonized by the Code. Member States are allowed to impose on certain service providers under their jurisdiction reasonable must carry obligations for the transmission of specified radio and television broadcast channels. Such obligations are required to be based on clearly defined general interest objectives, be proportionate and transparent and are subject to periodic review. We are subject to must carry regulations in all markets in which we operate, which are different among Member States. We do not expect the European Commission or the Member States to curtail such obligations 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, which is directly applicable in all Member States, permits the provision of specialized services, optimized for specific content and subjects service providers to reasonable traffic management requirements. The regulation also abolished retail roaming tariffs beginning in June 2017 and introduced wholesale roaming price caps. In 2019, the E.U. also introduced caps on wholesale rates for intra-E.U. calls (i.e. calls from the users' Member State of residence to another Member State) to bring these in line with the wholesale roaming caps.

Call termination tariffs are set by NRAs following an assessment of the relevant mobile and fixed call termination markets. The Code introduced the system of single maximum E.U.-wide voice termination rates for fixed and mobile. On December 18, 2020, the European Commission adopted a delegated regulation directly applicable in all Member States, which sets the maximum termination rates that service providers are allowed to charge each other for mobile and fixed termination services. By 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 €0.2 per minute.

*Broadcasting and Content Law*

Although the distribution of video channels by a service provider is within the scope of the Code, the activities of a broadcaster are harmonized by other elements of E.U. law, in particular the Audiovisual Media Services Directive (**AVMSD**). The AVMSD was revised and reissued on December 18, 2018. E.U. Member States were required to implement the revised AVMSD into national law by September 19, 2020; however, a number of Member States are reported to be late with implementation.

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 are required to 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. This is referred to as the country of origin principle and applies to both linear and non-linear services. In addition, when we offer third-party VoD services on our network, it is the business of the third-party provider of the services, and not us as the distributor, that is regulated in respect of these services.

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 certain of our businesses.

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, according to the regulation of the European Commission addressing the portability of online audiovisual content services, commercial providers of online content services (including OTT service providers) are required to enable subscribers who are temporarily present in any Member State with access and use of online content services in substantially the same manner as in the Member State of residence. Our services comply with these portability requirements.

*Copyright Law*

In April 2019, the European Commission adopted a new directive relating to satellite and cable retransmissions. The directive introduces a new country of origin principle in relation to online content, extends the existing copyright clearance system to other technologies (such as satellite, mobile and IPTV) and extends a similar rights clearance system to directly injected cable channels. Member States are required to transpose the majority of this directive into national law by June 2021.

*Technological Regulation*

The European Commission is increasingly imposing additional mandatory requirements and encouraging voluntary solutions regarding energy consumption of the telecommunications equipment we provide our customers. We have been participating in discussions and studies regarding energy consumption with the European Commission and with experts working on their behalf. In addition, we have been working to lower power consumption of our set-top boxes. We have also worked with a large group of companies to create a voluntary agreement on set-top box power consumption as an alternative to regulation, which has been formally recognized by the European Commission. Nevertheless, 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 and are subject to audit to ensure compliance.

Also, the Radio Equipment Directive, which has been transposed into national legislation by E.U. Member States, establishes a regulatory framework for placing radio equipment on the market. Its objective is a single market for radio equipment by setting essential requirements for safety and health, electromagnetic compatibility, and the efficient use of the radio spectrum. It 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. It also takes into account the need for improved market surveillance, especially for the traceability obligations of manufacturers, importers and distributors. As a result, all of the devices we purchase and/or develop which contain radio interfaces (such as WiFi), must operate under these rules.

There is a Mutual Recognition Agreement established between the E.U. and Switzerland for the purpose of mutual recognition of conformity assessment of regulated products. As a result, the Standby Regulation and the Radio Equipment Directive are also applicable in Switzerland.

As part of the E.U.'s Radio Spectrum Policy Program, spectrum made available through the switch off of analog television has been approved for mobile broadband. This spectrum, known as the "digital dividend", is in the 700 - 862 MHz band. The terms under which this spectrum becomes available varies among the European countries in which we operate. 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 or all of our services, (2) make some changes to our networks, or (3) change the equipment that we deploy. In approving mobile broadband, however, the Radio Spectrum Policy Program states that the new mobile services must co-exist with existing services, such as cable and DTT, to avoid harmful interference. As a result, we are in ongoing discussions with relevant Member States and the European Commission to develop mitigation techniques and to engage NRAs to launch regulatory dialog with equipment manufacturers and mobile providers to develop co-existing networks.

*Other European Level Regulation*

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

In May 2018, the General Data Protection Regulation (**GDPR**) with respect to data protection and retention 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. As required, our operations have implemented various measures internally and with third-party vendors to meet these requirements. In addition, in January 2017, the European Commission published a proposal for a new e-Privacy regulation, replacing the current e-Privacy Directive that regulates privacy related issues in the electronic communications sector. Negotiations among E.U. Member States are still in process, and the proposal still needs to go through the legislative process.

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. In principle, our operations within the E.U. do not fall under the NIS Directive as it exempts providers of Electronic Communications Services, which are governed by the E.U. telecommunications framework. Exceptions to this are some national national transpositions of the NIS Directive, for instance in the Netherlands and Ireland, which require our network and communication equipment to be compliant with such obligations. In addition, in December 2020, the European Commission presented a revised version of the current NIS Directive as part of a new cybersecurity strategy. The legislative proposal seeks to expand the scope of the current NIS Directive by adding new sectors based on their criticality for the economy and society, including telecoms providers, which would imply stricter enforcement regimes in the future. The proposal still needs to go through the legislative process and adoption by E.U. institutions.

In December 2020, the European Commission also published the Digital Services Act (**DSA**) legislative proposal to replace the 2000 E-Commerce Directive. The DSA sets clear responsibilities and accountability for providers of intermediary services, especially improving the mechanisms for the removal of illegal content and for the effective protection of users' fundamental rights online. The DSA proposal, which complements sector-specific legislation such as the AVMSD, still needs to go through the legislative process and is expected to have limited impact on us.

Additionally, in December 2020, the European Commission published a legislative proposal concerning a new Digital Markets Act (**DMA**). The DMA aims to tackle unfair practices carried out by digital platforms acting as gatekeepers on the market and only applies to major providers of core platform services, such as search engines, social networks and online intermediation services. The DMA requires proactive action and prohibits a number of practices by such digital platforms with respect to interoperability and data sharing. The DMA proposal still needs to go through the legislative process and is expected to have limited impact on us.

Our operating companies are also subject to both national and European level regulations on competition and on consumer protection, which are broadly harmonized at the E.U. level and 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.

*United Kingdom*

The U.K. Office of Communications (**Ofcom**) is the key regulatory authority for the communications sector in which Virgin Media operates in the U.K. It is responsible for furthering the interests of citizens in relation to communications matters and furthering the interests of consumers in relevant markets where appropriate by promoting competition. Ofcom is also responsible for regulating the BBC, a role previously undertaken by the BBC Trust. In December 2020, it was also announced that Ofcom has been appointed the regulatory body responsible for online harms in the U.K., but the legislation which underpins the regulatory framework, the Online Safety Bill, still needs to progress through Government and Parliament before being passed. The U.K. Competition and Markets Authority has jurisdiction with respect to competition matters.

<u>End of Contract Notifications and Annual Best Tariff Notifications</u>. In 2019, Ofcom issued new regulatory requirements originating from the European Electronic Communications Code, that, effective from February 2020, obligate providers 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 provider 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 provider can offer them. In both cases, providers must also set out the price available to new customers for an equivalent service offering. These new requirements adversely impacted our revenue and increased certain of our costs in the U.K. during 2020, and we expect additional and potentially more significant adverse impacts on our operating results in the U.K. in future periods.

<u>Broadband Expansion</u>. At the end of 2019, super-fast broadband was available to more than 95% of U.K. premises. To stimulate private investment in this endeavor, the U.K. government has been using money from the publicly funded BBC license fee, underspend from the Analogue TV Switch-Off Project and other sources of public investment. The state aid measure permitting this subsidy was renewed (and amended) in 2016 and is expected, through amendments to its "underspend" provisions, to result in up to an additional 1% to 2% super-fast coverage, making it available to 97%-98% of the population by the end of 2020.

The U.K. government has also been supporting the market rollout of full fiber and 5G services. Such support has included public funding for the creation of a match-funded "full fiber deployment" fund, business rate relief for the deployment of new full fiber networks and public funding for a strategic program of full fiber and 5G trials. The U.K. government's November 2017 budget included £190.0 million ($259.4 million) for the first and second phases of its local full fiber deployment fund and £160.0 million ($218.4 million) for the first phase of the 5G trials. In the second half of 2019, the U.K. government set out its ambition for all premises to have access to a gigabit capable service by the end of 2025. To facilitate this, it announced a gigabit capability public fund of £5 billion ($7 billion) for areas that are not commercially viable. As further detailed in the U.K. government's Spending Review issued in November 2020, £1.2 billion of the £5 billion gigabit capability fund would be available to subsidize the rollout of gigabit-capable broadband in the hardest to reach areas of the U.K. between now and 2025, with the possibility of additional draw downs from the gigabit capability fund if industry has the capacity to use such funds. In addition, the National Infrastructure Strategy, which was published alongside the Spending Review, highlighted that the U.K. government is now working with industry to target a minimum of 85% gigabit capable coverage by 2025, while seeking to accelerate rollout further to get as close to 100% as possible.

The Telecommunications Infrastructure Bill received Royal Assent in February 2018, which gave effect to the U.K. government's plans to provide full business rate relief for new fiber infrastructure built during the 2017-2022 rating period. Secondary legislation followed in April 2018, clarifying that the relief also applies to newly lit fiber and any plant and machinery used to build the infrastructure. In addition, the U.K. government published its Telecoms Infrastructure Review in July 2018. This Review explored whether the conditions for investment in fiber are optimal in the U.K. and what policy changes should be considered to encourage greater investment in new digital infrastructure. The Government concluded that, with the right policy support, infrastructure based competition will deliver FTTP/Gbit capable networks to approximately 90% of U.K. premises. To facilitate this, the U.K. government intends to introduce a notification regime for multiple dwelling unit wayleaves, introduce a requirement for new housing developments to have Gbit capable access and increase consistency in street works and duct access. To this end, following consultation, the Telecommunications Infrastructure (Leasehold Property) Bill was presented to parliament in October 2019 and is expected to be passed in 2021, with the bill currently awaiting its third reading in the House of Lords. New building regulations requiring new housing developments to have Gbit capable access are expected to be consulted on in the first quarter of 2021 and made law during the first half of 2021. The U.K. government conducted its fundamental review into business rates over the summer of 2020 and is expected to publish its recommendations in the first half of 2021.

In November 2015, the U.K. government announced that everyone would have a legal right to request a broadband connection of at least 10 Mbps regardless of where they live. To facilitate this, a broadband Universal Service Obligation (**USO**) was introduced via secondary legislation, which took effect in March 2020. The USO is aimed, in particular, at addressing the final 5% of the population in the U.K. without access to a broadband connection of a reasonable speed. Ofcom is responsible for implementation, including designation of the Universal Service Providers (**USPs**), currently BT and KCOM Group PLC. Additionally, Ofcom is responsible for deciding whether the USO constitutes an "unfair burden" on the USPs and, if so, designing an industry funding mechanism to compensate the USPs. In May 2020, Ofcom issued a statement confirming its approach to assessing any unfair burden claims as well as determining which operators would be required to contribute to a universal service industry fund. Ofcom allows USPs to request Ofcom's review of potential compensation claims for any efficiently incurred 'unfair net cost burden' once per year. If Ofcom accepts a request for review, it will consider whether it is fair for the USP to bear some or all of the burden, as well as consider the cost to Ofcom and the industry of establishing and administering an industry fund. The net burden would be assessed based on the incremental cost of delivering the USO, less the benefits associated with being the USP. Ofcom intends to determine which operators would contribute to the fund and how much they would contribute at a later date. Ofcom has also indicated the USPs cannot make this request any earlier than March 2021. In the meantime, the number of consumers who would be eligible for the universal service is expected to decline, as providers continue to upgrade and expand their networks.

Television and VoD Services. In the U.K., Virgin Media is required to hold individual licenses under the Broadcasting Acts 1990 and 1996 for any television channels (including barker channels), which Virgin Media owns or operates and for the provision of 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 Ofcom. Under these licenses, each covered service must comply with a number of Ofcom codes, including the Broadcasting Code, and with all directions issued by Ofcom. Breach of any of the terms of a TLCS license may result in the imposition of fines on the license holder and, ultimately, the license being revoked.

As a provider of an on-demand program service (**ODPS**), Virgin Media must 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, the prohibition on providing an ODPS.

New Security Regulations. In November 2020, the U.K. government introduced the Telecoms Security Bill, which will impose a new security framework on telecoms providers and provide the Secretary of State for Digital, Culture, Media and Sport with new powers to direct telecoms providers to remove High Risk Vendors (HRVs) from their networks. The bill is expected to be passed into law by the spring of 2021.

Regulation of Broadband Markets. In March 2018, Ofcom completed its latest review of the Wholesale Local Access market (incorporating physical or passive network access via methods such as LLU and duct access). Ofcom found that BT continues to hold Significant Market Power and imposed corresponding remedies on it until April 2021. These remedies include price controls on "virtual" access to its wholesale 40/10Mbps FTTx product, the maintenance of access and pricing controls on its wholesale copper products and improvements to the existing physical infrastructure access product (third-party access to BT's duct and pole estate).

Future Approach to Regulation. In July 2018, Ofcom published a Strategic Policy Position, setting out its intended future approach to regulation from April 2021 (aimed at creating regulatory certainty to support investment in full fiber broadband). It includes an intention to take a more holistic consideration of business and residential markets (ultimately combining previously separate markets) and to consider different regulatory approaches in different parts of the country, reflecting the varying levels of network competition. In January 2020, Ofcom published the provisional conclusions from its holistic review of the residential broadband and business connectivity markets, setting out its intended approach to regulating them (to apply for a five year period beginning in April 2021) . It proposes to categorize areas of the country and apply regulation depending on the level of competition in those areas. In both non-competitive areas (~30% of premises) and in potentially competitive areas (~70% of premises), BT Openreach will continue to be required to provide wholesale access to its network; however, in the latter such wholesale access will be limited to BT Openreach's entry-level superfast broadband service and the price will rise in line with inflation. Although Ofcom has not identified any competitive areas at this stage, once it does so, all regulation will be lifted from those areas.

Ofcom intends to regulate BT Openreach's wholesale business connections (or "leased lines") in a similar way to residential broadband by varying its approach geographically to reflect the level of current or prospective competition and increasing charges in line with inflation.

Ofcom Review of Business Connectivity Markets. Ofcom published the conclusions of its last review of the business connectivity (leased lines) market in the third quarter of 2019. The review maintained the existing approach, to market definition, (flat) price caps for some wholesale BT services and a narrow dark fibre remedy on BT (in areas where infrastructure competition is non-existent and unlikely to occur). It also introduced an extension of the duct and pole remedy applying to BT to enable its use for (standalone) business grade services. Ofcom published its latest review of the business connectivity market in January 2020, as part of the broader, holistic review of the connectivity markets (see above under *Future Approach to Regulation*).

Mobile Service. Prior to January 1, 2021, as an MVNO, Virgin Media was subject to E.U. regulations relating to retail prices for roaming services. These regulations: set limits on certain wholesale tariffs for international mobile voice roaming, SMS tariffs and data roaming within the E.U.; provided for greater levels of transparency of retail pricing information; imposed measures to guard against bill shock in respect of data roaming; and prohibited the imposition of additional retail charges for roaming within the E.U. Following the expiration of the Brexit transition period on December 31, 2020, the U.K. is no longer subject to the same E.U. regulations. Instead, the Trade and Cooperation Agreement between the E.U. and the U.K. simply states that the parties will endeavor to cooperate on promoting transparent and reasonable rates for international mobile roaming services. However, the U.K. previously introduced a number of consumer measures aimed at providing safeguards for consumers, which will 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.

Mobile termination charges applied by mobile network operators are regulated by Ofcom under a Significant Market Power charge control condition. Under Virgin Media's MVNO agreement, these mobile termination charges are passed on to Virgin Media. Ofcom has set mobile termination charges for the period of 2018-2021, with rates reducing by approximately 5% from their starting levels by the end of this period. In August 2020, Ofcom launched a consultation on its review of the Wholesale Voice Markets 2021-26, which seeks to regulate both fixed and mobile voice markets beginning in April 2021. In its consultation, Ofcom proposed to continue to impose caps on the charges for terminating both mobile and fixed calls.

Fixed Voice Termination. Virgin Media has been designated as a provider with Significant Market Power on fixed voice termination. As a result, the rates it charges other providers for termination on its network are subject to regulation. This requires, among other things, the provision of termination on fair and reasonable terms, conditions and charges, which must be no higher than BT's regulated charges, unless certain conditions are met.

*Belgium*

The Belgisch Instituut voor Post en Telecommunicate (the **BIPT**), the Belgian NRA, has determined that Telenet is an operator with Significant Market Power in the market for call termination on an individual fixed public telephone network. Reciprocal termination rates have been imposed, which results in Telenet charging the interconnection rate of the incumbent telecommunications operator, Proximus. BIPT has confirmed a wholesale tariff of €0.116 ($0.14) per minute, which is currently in effect.

BIPT has adopted a bottom-up long run incremental cost model to calculate tariffs for call termination on individual mobile networks, resulting in a nominal value of €0.99 ($1.21) per minute, which is currently in effect. BIPT has also designated Telenet, as a mobile network operator, as having Significant Market Power in the market for "call termination on individual networks."

In 2011, BIPT and the regional regulators for the media sectors (together, the **Belgium Regulatory Authorities**) found Telenet to have Significant Market Power in the broadcasting market (the **2011 Decision**). The 2011 Decision imposed on Telenet an obligation to provide third-party operators, at specified "retail minus" tariff rates, with (1) a resale offer of an analog television package, (2) access to digital television platforms and (3) a resale offer of broadband internet access in combination with the digital television access obligation.

In 2018 the Belgium Regulatory Authorities adopted a market review decision (the **2018 Decision**), which replaced the 2011 Decision. The 2018 Decision finds that Telenet has Significant Market Power in the wholesale broadband market. The obligations include (1) providing third-party operators with access to the digital television platform (including basic digital video and analog video) and (2) making available to third-party operators a bitstream offer of broadband internet access (including fixed voice as an option). Telenet considered 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 filed an appeal with the Brussels Markets Court that was rejected on September 4, 2019.

The 2018 Decision no longer applied a retail minus pricing on Telenet, and instead, it imposed a 17% reduction in monthly wholesale cable resale access prices during an interim period before setting "reasonable access tariffs". On May 26, 2020, the Belgium Regulatory Authorities adopted a final decision regarding the "reasonable access tariffs" to replace the interim prices, which represents an estimated decrease of 11.5%, as compared to the initial August 1, 2018 interim rates, and is applicable as of July 1, 2020. These rates are expected to evolve over time due to, among other reasons, broadband capacity usage.

The 2018 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 (1) limit the bandwidth available to Telenet to provide new or expanded products and services to the customers served by its network 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 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.

*Switzerland*

Switzerland has a regulatory system that partially reflects the principles of the E.U., but otherwise is distinct from the European regulatory system of telecommunications. The Telecommunications Act (*Fernmeldegesetz*) regulates, in general, the transmission of information, including the transmission of radio and television signals. Most aspects of the distribution of radio and television, however, are regulated under the Radio and Television Act (*Bundesgesetz über Radio und Fernsehen*). In addition, the Competition Act, the Data Protection Act and the Act on the Surveillance of Post and Telecommunications are potentially relevant to our business. With respect to energy consumption of electronic home devices, the Energy Act and the Energy Ordinance are applicable to set-top boxes and modems.

Providers of telecommunication services using resources attributed to Switzerland's Federal Office of Communications (such as addressing elements and licensed radio frequencies) must register with the Federal Office of Communications. Dominant providers must grant access to their network to third parties, including LLU access; however, it is restricted to the copper wire network of the incumbent, Swisscom. Therefore, such unbundling obligations do not apply to our business in Switzerland and other cable operators. Also, any dominant provider must grant access to its ducts, subject to sufficient capacity being available in the relevant duct. At this time, only Swisscom has been determined to be dominant in this regard. Dominant operators are obliged to provide interconnection and all providers of services forming part of the universal service in Switzerland have to ensure interoperability of services.

In regards to call termination as part of interconnection agreements, Swisscom as market dominant provider, must offer these services at cost-oriented prices and disclose the conditions and prices for their individual access services. In interconnection agreements with Swisscom, reciprocal termination rates are imposed.

The final Telecommunications Act and corresponding ordinances were published in November 2020 and became binding on January 1, 2020, with transition periods for certain obligations (such as call filter and roaming obligations). Changes include more extensive consumer and youth protection measures (such as decreasing roaming fees, measures to prevent spoofing). In terms of net neutrality, it foresees more transparency for the customer—the customer must be informed if peer-to-peer traffic is treated unequally and traffic management measures are only allowed under certain very restrictive circumstances (e.g. to fight exceptional network congestion). In addition, customers must be informed about the quality of the internet service (both fixed and mobile internet), and providers must introduce a call filter blocking unlawful calls. New and stronger obligations were also implemented regarding roaming (such as requiring mobile providers to: offer discounted roaming packages with a validity of 12 months, bill roaming charges by the second or per kilobyte and establish maximum spend limits for all roaming services).

Under the Radio and Television Act and the corresponding ordinance, the Federal Government and the Federal Office of Communications can select up to 25 programs that have to be distributed without the cable operator being entitled to compensation. When a program is not on the mandatory distribution list, network operators must still treat all programs in an equal and non-discriminatory manner.

In September 2016, the Intelligence Agencies Act was approved by the Swiss population and became effective in September 2017. For Telecommunications service providers, the Intelligence Agencies Act set forth new obligations regulating cable traffic.

In September 2020, the Swiss Parliament adopted a revised version of the Swiss Data Protection Act (DPA), which provides more transparency regarding the processing of data, strengthens the individual's information rights (e.g. if his/her data is processed in a foreign country) and follows the developments in the E.U., allowing for the continued flow of personal data from the EEA to Switzerland. The corresponding ordinances to the Swiss DPA are expected to be published for the public consultation phase in the spring of 2021.

In terms of 5G expansion developments, the network rollout is significantly hampered at different levels. On a federal level, signature collection is under way for five different people initiatives, all targeting 5G. On the cantonal level, several cantons have suspended permitting of 5G and several cantonal parliaments are requesting a moratoria for 5G and mast citing. On a communal level, several municipalities have stopped antenna permitting and/or issued planning zones, making it impossible to process permits for new antennas as well as minor changes to existing ones.

*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.

On August 5, 2013, the Autoriteit Consument & Markt (**ACM**), the Netherlands NRA, published a market analysis decision on call termination, which combines both the fixed termination market and the mobile termination market. Following various administrative actions, the Dutch Supreme Administrative Court upheld the ACM decision in July 2017. The implementation of the new tariff became effective on July 12, 2017, and will apply until the date that new European tariffs enter into force.

In July 2015, the Dutch incumbent telecommunications operator KPN filed an appeal against the European Commission regarding its decision to approve the acquisition of Ziggo, which we completed in November 2014. In October 2017, the European General Court ruled that the European Commission did not state sufficient reasons for not analyzing the possible vertical anti-competitive effects on the market for premium pay TV sports channels; thereby annulling the European Commission's clearance of the Ziggo acquisition. The E.U. Merger Regulation provides in such a case that the transaction be re-examined by the European Commission with a view of adopting a new decision. As a result, we filed a formal re-notification of the Ziggo acquisition with the European Commission. In May 2018, the European Commission again cleared the acquisition. In November 2018, KPN appealed the new European Commission's clearance of Ziggo/UPC on grounds similar to last time. VodafoneZiggo JV submitted a Statement in Intervention in June 2019. An oral hearing was held on September 15, 2020, and on January 27, 2021 the court rejected KPN's appeal.

KPN also filed a court challenge against the European Commission's 2016 decision that approved the VodafoneZiggo JV transaction. KPN is seeking annulment of the 2016 decision. Oral hearings took place in November 2018.On May 23, 2019, the Court rejected KPN's appeal.

On February 27, 2018, the ACM published a draft decision of its analysis of the LLU market, concluding that there is a single market for local and central access. ACM referred to this market as the Wholesale Fixed Access market and concluded that KPN and the VodafoneZiggo JV had joint Significant Market Power. As a result, ACM imposed on the VodafoneZiggo JV an obligation to offer wholesale cable access and continued wholesale cable access regulation of KPN. Following a market consultation, ACM submitted the draft decision to the European Commission. After comments by the European Commission, ACM published the final decision on September 28, 2018, which became effective on October 1, 2018. The VodafoneZiggo JV published a draft Reference Offer on December 31, 2018 and published tariffs on March 31, 2019. In parallel, the VodafoneZiggo JV appealed ACM's decision before the national court and initiated an action before the European General Court. The national court annulled ACM's decision and as a result, the VodafoneZiggo JV is no longer obligated to offer cable access. In the action before the European General Court, a decision on the admissibility is expected on February 25, 2021.

On November 9, 2018, the implementation of the NIS Directive by the Netherlands entered into force. In general, providers of electronic communication services are not in scope of the NIS Directive. The legislator for the Netherlands, however, decided to apply, to a certain extent, the NIS Directive on providers of electronic communication services. As a result, the VodafoneZiggo JV must notify the Netherlands Telecoms Agency and the National Cyber Security Center when a cybersecurity incident occurs, as well as the Netherlands Data Protection Authority if a data breach occurs.

**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 the 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 fixed wireless access (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 20 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, namely in connection with our Network Extensions, 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, including in connection with our Network Extensions, 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 rebuilds, upgrades or extensions of our network (including the Network Extensions) 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 rebuilds, upgrades or extensions. Additionally, costs related to our Network Extensions and 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 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 and restrictions available. 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 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. 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.

***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, or 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 (see note 19 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K), 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.

***The "Virgin" brand is used by our subsidiary Virgin Media under licenses from Virgin Enterprises Limited and is not under the control of Virgin Media. 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 Virgin Media as a licensee and the licenses from Virgin Enterprises Limited can be terminated in certain circumstances.*** The "Virgin" brand is integral to Virgin Media's corporate identity. Virgin Media is 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 Virgin Media does business) could have a material adverse effect on Virgin Media's reputation and on Virgin Media's 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 Virgin Media with an opportunity to cure, (1) if Virgin Media or any of its affiliates commits persistent and material breaches or a flagrant and material breach 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 Virgin Media 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 Virgin Media's and our business and results of operations.

**Factors Relating to Overseas Operations and Foreign 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 seek to 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, 2020, 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 also are 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, 2020 was to the British pound sterling, euro and Swiss franc as 47.3%, 30.6% and 18.8% of our reported revenue during the period was derived from subsidiaries whose functional currencies are the British pound sterling, euro and Swiss franc, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for the Swiss franc and 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 businesses are subject to licensing or registration eligibility rules and regulations, which vary by country. Specifically, the E.U. requires Member States to abolish communication network exclusivity in its territory, allowing operators into the E.U. markets based on a simple registration and resulting in greater competition in territories where our businesses may already be active. It is possible that 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 these businesses. In a number of countries, our ability to increase the prices we charge for our cable television service or make changes to 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 to grant third parties access to our bandwidth, frequency capacity, facilities or services to distribute their own services or resell our services to end customers. Consequently, our businesses must adapt their ownership and organizational structure 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 or loss of required licenses or other adverse conditions.

Adverse changes in rules and regulations could:

- impair our ability to use our bandwidth 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

- have a significant adverse impact on 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 in several countries in which they operate. This is particularly the case with respect to any proposed business combinations, which will 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 governmental 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 - Other Regulatory Matters* in note 19 to our consolidated financial statements.

***New 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 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 cable television, telephony, internet and mobile services have been and are still being introduced. For example, in the E.U. a large element of regulation affecting our business derives from the European Electronic Communications Code (**Code**) that is the primary source of communications regulation in the E.U. The Code is the basis of the regulatory regimes concerning many of the services we offer across the E.U. and covers issues such as access, user rights, privacy, must carry for video services and competition. In addition, we are subject to review by competition or national regulatory authorities in certain countries concerning whether we exhibit Significant Market Power. A finding of Significant Market Power can result in our company becoming subject to pricing, open access, unbundling and other requirements that could provide a more favorable operating environment for existing and potential 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.*** On June 23, 2016, the U.K. held a referendum in which voters approved, on an advisory basis, an exit from the E.U., commonly referred to as "Brexit". The U.K. formally exited the E.U. on January 31, 2020. 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. On December 30, 2020, the E.U.-U.K. Agreement was approved by the U.K. Parliament, with retrospective ratification from the E.U. Parliament expected to follow in 2021. In the meantime, the E.U.-U.K. Agreement has been provisionally brought into effect. The E.U.-U.K. Agreement focuses on four main sectors, namely trade, economic and social cooperation, security and governance. 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, including our Network Extensions in the U.K.;
- 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 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, 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. We expect to seek to continue improving our company through attractive acquisitions, dispositions, 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 and the sales of the operations of UPC DTH and the Vodafone Disposal Group in May 2019 and July 2019, respectively, and the Sunrise Acquisition in November 2020. 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, 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, 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. 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.

***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. 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 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 project that has been undertaken by the OECD or the European Commission Anti-Tax Avoidance Package. The OECD, which represents a coalition of member countries that encompass most of the jurisdictions in which we operate, and the European Commission have undertaken studies and are publishing action plans that include recommendations aimed at addressing what they believe are issues within tax systems that may lead to tax avoidance by companies. It is possible that jurisdictions in which we do business could react to these initiatives or their own concerns by enacting tax legislation that could adversely affect us or our shareholders through increasing our tax liabilities.

**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, 2020, the outstanding principal amount of our consolidated debt, together with our finance lease obligations aggregated \$15.1 billion, including \$1.1 billion that is classified as current on our consolidated balance sheet and \$13.1 billion that is not due until 2026 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 2020 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 purchases 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 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 pay 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) has announced that measures will need to be undertaken by the end of 2021 to reform EURIBOR to ensure compliance with 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 GBP LIBOR rates, it intends to cease publishing 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, it is not possible to predict the exact transitional arrangements for calculating applicable reference rates that may be made in the U.K., the U.S., the Eurozone or elsewhere given that a number of outcomes are possible, including the cessation of the publication of one or more reference rates.

In October 2020, the International Swaps and Derivatives Association (the ISDA) launched a new supplement (the Fallback Supplement), which effective January 25, 2021, will amend the standard definitions for interest rate derivatives to incorporate fallbacks for derivatives linked to certain key interbank offered rates (IBORs). The ISDA also launched a new protocol (the Fallback Protocol), also effective January 25, 2021, that will enable 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 will apply following a permanent cessation of the IBOR in that currency and will be adjusted versions of the risk-free rates identified in each currency. Our loan documents 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 loan documents 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 than any new reference rate that applies to our LIBOR-indexed or EURIBOR-indexed derivative instruments. We anticipate managing 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 the company 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, 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.

***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, the risk of deflation and the stability of the British pound sterling and the euro, has contributed to a challenging global economic environment. Future developments are dependent upon a number of political and economic factors, including the effectiveness of measures by the E.U. Commission to address debt burdens of certain countries in Europe and low growth expectations. 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 weak growth and high unemployment, could potentially lead to fiscal reforms (including austerity measures), tax increases, sovereign debt restructurings, 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 and (2) 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 investments, derivative and other financial instruments, and undrawn debt facilities.*** Although we seek to manage the credit risks associated with our cash 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, 2020, our exposure to counterparty credit risk included (1) derivative assets with an aggregate fair value of $83.2 million, (2) cash and cash equivalent and restricted cash balances of $4,717.3 million and (3) aggregate undrawn debt facilities of $1,554.5 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.

***Our interest in the VodafoneZiggo JV is held pursuant to a Shareholders Agreement that contains 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 interest in the VodafoneZiggo JV is held pursuant to a shareholders' agreement (the **Shareholders Agreement**), which provides the terms of the governance of the VodafoneZiggo JV, including among others, decision-making process, information access, dividend policy and non-compete provisions. These provisions may prevent the VodafoneZiggo JV from making decisions or taking actions that would protect or advance the interests of our company, and could even result in the VodafoneZiggo JV making decisions or taking actions that adversely impact our company. Further, our ability to access the cash of the VodafoneZiggo JV pursuant to the dividend policy contained in the Shareholders Agreement may be restricted in certain circumstances. The Shareholders Agreement also provides for restrictions on the transfer of interests in the VodafoneZiggo JV, which could adversely affect our ability to sell our interest in the VodafoneZiggo JV 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 and the Shareholders Agreement, see note 7 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 losses from continuing operations of $1,466.7 million, $1,409.0 million and $1,411.5 million during 2020, 2019 and 2018, 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.

***Our share price may change significantly, and you may not be able to resell our ordinary shares at or above the price you paid or at all, and you could lose all or part of your investment as a result.*** In addition to the factors discussed in this Annual Report on Form 10-K, the trading price of each class of our ordinary shares may fluctuate significantly in response to numerous factors, many of which are beyond our control, including:

- actual or anticipated fluctuations in our revenue and other operating results;
- actual operating or financial results that vary from our guidance or the expectations of securities analysts and investors;
- changes in expectations as to our future financial performance, including financial estimates by securities analysts and investors;
- actual or anticipated future sales of our ordinary shares by us, our senior management or our other existing shareholders;
- investor sentiment with respect to our competitors, our business partners, and our industry in general;
- announcements by us or our competitors of significant services or features, technical innovations, acquisitions, strategic partnerships, joint ventures, or capital commitments;
- changes in operating performance and stock market valuations of companies in our industry, including our competitors;
- price and volume fluctuations in the overall stock market, including as a result of trends in the economy as a whole;
- media coverage of our business and financial performance; and
- general domestic and international economic and political conditions.

The stock market has recently experienced extreme price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. In particular, price and volume fluctuations in the stock market as a whole may affect the market price of our ordinary shares in ways that may be unrelated or disproportionate to our operating performance. These broad market and industry fluctuations may adversely affect the trading price of our ordinary shares, regardless of our actual operating performance.

Securities class action litigation has often been instituted against companies following periods of volatility in the overall market and in the market price of a company's securities. Such litigation, if instituted against us, could result in substantial costs, divert our management's attention and resources and have an adverse effect on our business, results of operations and financial condition.

***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 30.15% of our aggregate voting power as of February 7, 2021. 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 30.15% 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.*** In March 2020, the World Health Organization declared the outbreak of a novel strain of coronavirus (COVID-19) to be a global pandemic. In response to the COVID-19 pandemic, emergency measures have been imposed by governments worldwide, including travel restrictions, restrictions on social activity and the shutdown of non-essential businesses. These measures 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, including with respect to, among other items, (1) our ability to access capital necessary to fund property and equipment additions, debt service requirements, acquisitions and other investment opportunities, the repurchase of equity securities or other liquidity needs, (2) the ability of our customers to pay for our products and services, (3) our ability to maintain or increase our residential and business subscriber levels, (4) our ability to offer attractive programming, particularly in consideration of the recent cancellation of numerous worldwide sporting events, (5) the ability of our suppliers and vendors to provide products and services to us and (6) our share price. 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 19 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 2020 and 2019. 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 |
| **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 |
| **2019** | | |
| First quarter | $ 26.60 | $ 20.99 |
| Second quarter | $ 30.05 | $ 24.74 |
| Third quarter | $ 29.11 | $ 24.66 |
| Fourth quarter | $ 25.05 | $ 22.61 |

#### Holders

As of January 31, 2021, there were 1,198, seven and 1,366 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, 2020:

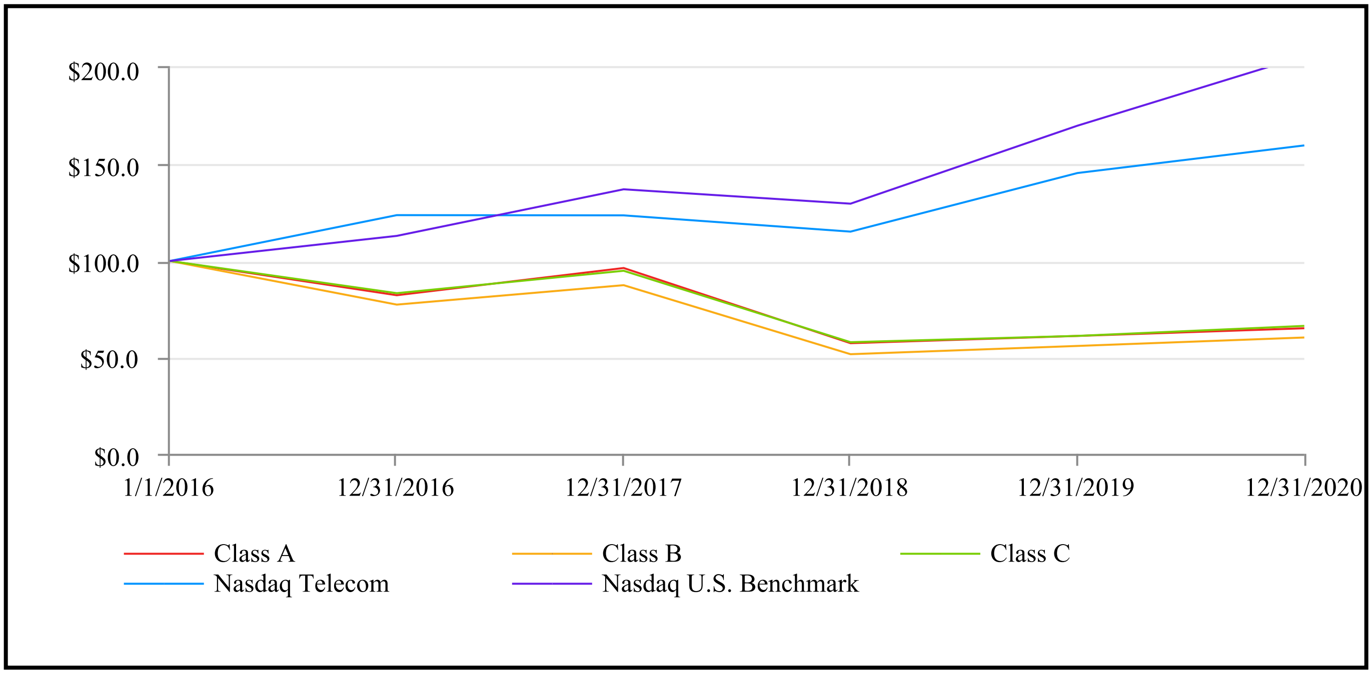
| Period | Total number of shares purchased | Average price paid per share (a) | Total number of shares purchased as part of publicly-announced plans or programs | Value of shares that may yet be repurchased under the plans or programs |
|---|---|---|---|---|
| October 1, 2020 through October 31, 2020: | | | | |
| Class A | — | — | — | (b) |
| Class C | 1,597,600 | 20.67 | 1,597,600 | (b) |
| November 1, 2020 through November 30, 2020: | | | | |
| Class A | — | — | — | (b) |
| Class C | 1,442,400 | 20.81 | 1,442,400 | (b) |
| December 1, 2020 through December 31, 2020: | | | | |
| Class A | — | — | — | (b) |
| Class C | 1,268,900 | 23.71 | 1,268,900 | (b) |
| Total — October 1, 2020 through December 31, 2020: | | | | |
| Class A | — | — | — | (b) |
| Class C | 4,308,900 | 21.61 | 4,308,900 | (b) |

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

(b) As of December 31, 2020, the remaining amount authorized for share repurchases was $1.0 billion.

## 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, 2016 to December 31, 2020, 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 performance presented below includes the retrospective impact of certain distributions of LiLAC Shares on July 1, 2016. The graph assumes that $100 was invested on January 1, 2016.




| | December 31, | | | | |
|---|---|---|---|---|---|
| | 2016 | 2017 | 2018 | 2019 | 2020 |
| Liberty Global - Class A | $ 82.24 | $ 96.35 | $ 57.37 | $ 61.13 | $ 65.11 |
| Liberty Global - Class B | $ 77.37 | $ 87.45 | $ 51.66 | $ 55.94 | $ 60.32 |
| Liberty Global - Class C | $ 83.30 | $ 94.92 | $ 57.89 | $ 61.15 | $ 66.33 |
| ICB 6500 Telecommunications | $ 123.77 | $ 123.65 | $ 115.22 | $ 145.60 | $ 159.92 |
| Nasdaq US Benchmark TR Index | $ 113.01 | $ 137.17 | $ 129.71 | $ 170.14 | $ 206.32 |

## 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, 2020 and 2019.
- *Liquidity and Capital Resources.* This section provides an analysis of our corporate and subsidiary liquidity, consolidated statements of cash flows and contractual commitments.
- *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, 2020.

Included below is an analysis of our results of operations and cash flows for 2020, as compared to 2019. An analysis of our results of operations and cash flows for 2019, as compared to 2018, 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, 2019 (our **2019 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) the U.K. and Ireland through Virgin Media, (ii) Belgium through Telenet and (iii) Switzerland, Poland and Slovakia through UPC Holding. In addition, we own a 50% noncontrolling interest in the VodafoneZiggo JV, which provides residential and B2B communications services in the Netherlands.

Effective May 7, 2020, in connection with the pending formation of the U.K. JV, we began accounting for the U.K. JV Entities as held for sale. Accordingly, the assets and liabilities of the U.K. JV Entities are included in assets held for sale and liabilities associated with assets held for sale, respectively, on our December 31, 2020 consolidated balance sheet. Consistent with the applicable guidance, we have not reflected similar reclassifications in our consolidated statements of operations or cash flows. For further information regarding the pending formation of the U.K. JV, see note 6 to our consolidated financial statements.

As further described in note 6 to our consolidated financial statements, we completed the sale of (i) our operations in Germany, Romania, Hungary and the Czech Republic (exclusive of our DTH operations) on July 31, 2019 and (ii) the operations of UPC DTH on May 2, 2019. Accordingly, (a) 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. 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.

#### *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, 2020, our consolidated businesses owned and operated networks that passed 26,296,100 homes and served 11,303,000 fixed-line customers and 8,537,600 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, Skillz, All3Media, Univision, CANAL+ Polska, 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.

We currently are engaged in certain network extension programs across our footprint, which we collectively refer to as the "**Network Extensions**." During 2020, pursuant to the Network Extensions, we connected approximately 561,000 additional residential and commercial premises (excluding upgrades) to our two-way networks, including approximately 426,000 residential and commercial premises connected by Virgin Media in the U.K. and Ireland. We expect to continue the Network Extensions in 2021. Depending on a variety of factors, including the financial and operational results of these programs, the Network Extensions may be continued, modified or cancelled at our discretion.

The capital costs associated with the Network Extensions, which include the costs to build out the networks and the purchase and installation of related customer premises equipment, are expected to decline in 2021 as compared to 2020, but still represent a large portion of our capital costs. For information regarding our expected property and equipment additions during 2021, see *Liquidity and Capital Resources — Consolidated Statements of Cash Flows* below.

Our assessment of the impacts of the Network Extensions are subject to competitive, economic, regulatory and other factors outside of our control.

***Impact of COVID-19***

In March 2020, the World Health Organization declared the outbreak of a novel strain of the coronavirus (**COVID-19**) to be a global pandemic. In response, emergency measures were imposed by governments worldwide, including travel restrictions, restrictions on social activity and the shutdown of non-essential businesses. These measures have adversely impacted the global economy, disrupted global supply chains and created significant volatility and disruption of financial markets. In accordance with government mandates or recommended guidelines, as well as our desire to protect the health and safety of our employees, customers and communities, many of our retail stores were temporarily closed in mid-March 2020 and remained closed for up to several months. In addition, on March 16, 2020, most of our office personnel began working remotely, and many continue to do so. We also undertook certain short-term commercial initiatives in response to the pandemic with respect to our product and service offerings, including (i) free-of-charge speed upgrades for many of our broadband internet customers, (ii) the offering of unlimited minutes to many of our postpaid mobile subscribers, (iii) increases in the number of available kids channels, as well as the offering of several free movies and television series to many of our video subscribers, (iv) modifications to our disconnection policies for non-paying customers, including (a) extended time periods for delinquent accounts before we commence service restrictions or disconnections and (b) the temporary suspension of certain late payment charges, and (v) the temporary pausing of certain sports subscription charges.

The facts and circumstances surrounding the COVID-19 pandemic continue to change rapidly and, accordingly, the ultimate impact that COVID-19 will have on the global economy and our company is highly uncertain and impossible to predict. To date, our company has not experienced an overall material adverse impact from the COVID-19 pandemic, as demand for the products and services that we provide has increased following the stay-at-home and remote work restrictions or recommendations that have been implemented throughout the countries in which we operate. In this regard, we have experienced reductions in our residential churn rates during 2020 in all of our markets. During the period from mid-March through December 31, 2020, certain of our revenue streams were adversely impacted by the COVID-19 pandemic, the most notable of which include (i) lower revenue associated with the loss of exclusive programming content, primarily during the second quarter of 2020, (ii) lower sales of mobile handsets, due largely to the fact that, as discussed above, many of our retail stores were closed for a significant portion of the second quarter, (iii) lower broadcasting revenue in Belgium and Ireland and (iv) lower interconnect and mobile roaming revenue resulting from changes in mobile usage associated with factors such as reduced travel and the use of WiFi alternatives during stay-at-home mandates or recommendations. With respect to our Adjusted EBITDA during this timeframe, the aforementioned revenue declines had a less significant impact, as (a) we received certain credits for content costs and lost revenue associated with the loss of exclusive programming content, which offset the related revenue declines, (b) mobile handset sales generate low margins and (c) the lower interconnect and roaming revenue was largely offset by similar declines in interconnect and roaming expenses. In addition, our Adjusted EBITDA has been positively impacted by various other factors relating to the COVID-19 pandemic, including (1) lower costs associated with customer service and sales and marketing and (2) the benefits to our Adjusted EBITDA related to the aforementioned declines in residential churn rates. In this regard, we estimate that the overall adverse impact of the COVID-19 pandemic on our Adjusted EBITDA during the 2020 was relatively minimal. For additional information regarding the impact of COVID-19 on our results of operations for the year ended December 31, 2020, see *Discussion and Analysis of our Reportable Segments* below.

Although we have not yet experienced any material adverse impact to cash collections from our residential or B2B customers, the risk that certain customers will be unable to continue to pay for our services in future periods could increase to the extent that the current economic disruption is prolonged.

As our residential and business customers navigate through the COVID-19 pandemic, the connectivity that our broadband networks allow has been essential, and demand for the products and services that we provide has increased. This has resulted in a significant increase in data consumption by our customers, as well as the extension of peak traffic times, which were previously concentrated during evening hours and now span the majority of the day. Notwithstanding these increased traffic levels, our networks have continued to perform exceptionally well, and our technicians have and will continue to work diligently to ensure the reliability of our networks.

As indicated above, the COVID-19 pandemic has caused significant distress in global financial markets that could have an adverse impact on our company. However, we currently believe our financial risks are mitigated by several factors, including the following: (i) our access to our cash and cash equivalents and short-term investments has not been impaired, (ii) we do not currently perceive a significant risk of a credit event that would impair our cash holdings, derivative assets or restrict available credit facilities, (iii) we continue to maintain a strong balance sheet, with over 87% of our debt not due until 2026 or later, (iv) our credit facilities do not contain maintenance-based leverage covenants, with the exception of any revolving facilities that are drawn in excess of 40% of total availability (such revolving facilities were undrawn at December 31, 2020), and (v) our derivative instruments provide protection against adverse changes in financial markets, such as the weakening of the British pound sterling and declines in the value of certain of our fair value investments. In addition, we have implemented enhanced risk monitoring procedures at this time of heightened market volatility.

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.

***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 average cable 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.

In addition to competition, our operations are subject to macroeconomic, political and other risks that are outside of our control. For example, on June 23, 2016, the U.K. held a referendum in which voters approved, on an advisory basis, an exit from the E.U., commonly referred to as "Brexit." The U.K. formally exited the E.U. on January 31, 2020, and in December 2020, the U.K. and the E.U. announced a deal for "Trade and Cooperation" agreement. For additional information regarding certain risks to our company associated with Brexit, see *Item 1A. Risk Factors* included in Part I of this Annual Report on Form 10-K.

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 - Other Regulatory Matters* in note 19 to our consolidated financial statements.

**Results of Operations**

We have completed a number of transactions that impact the comparability of our 2020 and 2019 results of operations, the most notable of which are the (i) Sunrise Acquisition on November 11, 2020 and (ii) De Vijver Media Acquisition on June 3, 2019. For further information, see note 5 to our consolidated financial statements.

In the following discussion, we quantify the estimated impact of acquisitions (the **Acquisition Impact**) 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.

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, 2020 was to the British pound sterling, euro and Swiss franc as 47.3%, 30.6% and 18.8% of our reported revenue during the period was derived from subsidiaries whose functional currencies are the British pound sterling, 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, including broadband internet, video, fixed-line telephony and mobile services. For detailed information regarding the composition of our reportable segments and how we define and categorize our revenue components, see note 20 to our consolidated financial statements. For information regarding the results of operations of the VodafoneZiggo JV, refer to *Discussion and Analysis of our Consolidated Operating Results - Share of results of affiliates* below.

The tables presented below in this section provide the details of the revenue and Adjusted EBITDA of our consolidated reportable segments for 2020, as compared to 2019. 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 2020, 2019 and 2018 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 loss from continuing operations to Adjusted EBITDA:

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Loss from continuing operations | $ (1,466.7) | $ (1,409.0) | $ (1,411.5) |
| Income tax expense (benefit) | (256.9) | 253.0 | 1,573.3 |
| Other income, net | (76.1) | (114.4) | (43.4) |
| Share of results of affiliates, net | 245.3 | 198.5 | 8.7 |
| Losses on debt extinguishment, net | 233.2 | 216.7 | 65.0 |
| Realized and unrealized losses (gains) due to changes in fair values of certain investments and debt, net | (45.2) | (72.0) | 384.5 |
| Foreign currency transaction losses (gains), net | 1,416.3 | 94.8 | (90.4) |
| Realized and unrealized losses (gains) on derivative instruments, net | 879.3 | 192.0 | (1,125.8) |
| Interest expense | 1,188.5 | 1,385.9 | 1,478.7 |
| Operating income | 2,117.7 | 745.5 | 839.1 |
| Impairment, restructuring and other operating items, net | 98.6 | 156.0 | 248.2 |
| Depreciation and amortization | 2,331.3 | 3,652.2 | 3,858.2 |
| Share-based compensation expense | 348.0 | 305.8 | 206.0 |
| Adjusted EBITDA | $ 4,895.6 | $ 4,859.5 | $ 5,151.5 |

***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 cable and mobile products within a segment during the period.

*Revenue — 2020 compared to 2019*

| | Year ended December 31, | | Increase (decrease) | | Organic increase (decrease) | |
|---|---|---|---|---|---|---|
| | 2020 | 2019 | $ | % | $ | % |
| | in millions, except percentages | | | | | |
| U.K./Ireland | $ 6,588.4 | $ 6,600.3 | $ (11.9) | (0.2) | $ (58.1) | (0.9) |
| Belgium | 2,940.9 | 2,893.0 | 47.9 | 1.7 | (45.8) | (1.6) |
| Switzerland | 1,573.8 | 1,258.8 | 315.0 | 25.0 | (69.4) | (5.5) |
| Central and Eastern Europe | 486.9 | 475.4 | 11.5 | 2.4 | 16.6 | 3.5 |
| Central and Corporate (a) | 394.4 | 316.4 | 78.0 | 24.7 | (10.6) | (3.4) |
| Intersegment eliminations | (4.3) | (2.4) | (1.9) | N.M. | (1.9) | N.M. |
| Total | $ 11,980.1 | $ 11,541.5 | $ 438.6 | 3.8 | $ (169.2) | (1.5) |

N.M. — Not Meaningful.

(a) Amounts primarily include revenue earned from transition and other services provided to the VodafoneZiggo JV and various third parties and the sale of customer premises equipment to the VodafoneZiggo JV. For additional information, see notes 6 and 7 to our consolidated financial statements.

*U.K./Ireland.* The details of the decrease in U.K./Ireland's revenue during 2020, as compared to 2019, are set forth below:

| | Subscription revenue | Non-subscription revenue | Total |
|---|---|---|---|
| | | in millions | |
| Increase (decrease) in residential cable subscription revenue due to change in: | | | |
| Average number of customers | $ 7.1 | $ — | $ 7.1 |
| ARPU (a) | (64.0) | — | (64.0) |
| Increase in residential cable non-subscription revenue | — | 5.0 | 5.0 |
| Total increase (decrease) in residential cable revenue | (56.9) | 5.0 | (51.9) |
| Decrease in residential mobile revenue (b) | (1.7) | (18.9) | (20.6) |
| Increase in B2B revenue (c) | 14.6 | 14.5 | 29.1 |
| Decrease in other revenue (d) | — | (14.7) | (14.7) |
| Total organic decrease | (44.0) | (14.1) | (58.1) |
| Impact of FX | 32.8 | 13.4 | 46.2 |
| Total | $ (11.2) | $ (0.7) | $ (11.9) |

(a) The decrease in cable subscription revenue related to a change in ARPU was adversely impacted by (i) the COVID-19 pandemic, most notably with respect to video services, including lower revenue of approximately $28 million associated with the loss of exclusive programming content, primarily during the second and third quarters of 2020, comprising (a) credits that were given to certain customers and (b) the estimated impact of certain customers canceling their premium sports subscriptions, and (ii) lower revenue related to regulated contract notifications. For additional information regarding the contract notification requirements, see *Legal and Regulatory Proceedings and Other Contingencies - Other Regulatory Matters* in note 19 to our consolidated financial statements.

(b) The decrease in residential mobile non-subscription revenue is primarily attributable to a decrease in revenue from mobile handset sales, including (i) $20.3 million recognized during 2020 in connection with the completion of the VM Receivables Financing Sale, (ii) the adverse impact of retail store closures during the COVID-19 pandemic and (iii) the unfavorable impact of $7.5 million of revenue recognized during 2019 in connection with the sale of rights to future commission payments on customer handset insurance arrangements in the U.K.

(c) The increase in B2B subscription revenue is primarily due to an increase in the average number of SOHO customers in the U.K. The increase in B2B non-subscription revenue is primarily attributable to our operations in the U.K., including the net effect of (i) an increase in revenue associated with long-term leases of a portion of our network and (ii) a decrease in lower margin revenue related to business network services.

(d) The decrease in other revenue is attributable to lower broadcasting revenue in Ireland, largely due to the impact of the COVID-19 pandemic.

*Belgium.* The details of the increase in Belgium's revenue during 2020, as compared to 2019, are set forth below:

| | Subscription revenue | Non-subscription revenue | Total |
|---|---|---|---|
| | | in millions | |
| Increase (decrease) in residential cable subscription revenue due to change in: | | | |
| Average number of customers | $ (36.0) | $ — | $ (36.0) |
| ARPU | 12.0 | — | 12.0 |
| Decrease in residential cable non-subscription revenue | — | (0.7) | (0.7) |
| Total decrease in residential cable revenue | (24.0) | (0.7) | (24.7) |
| Increase (decrease) in residential mobile revenue (a) | 4.6 | (38.5) | (33.9) |
| Increase (decrease) in B2B revenue (b) | 25.7 | (7.8) | 17.9 |
| Decrease in other revenue | — | (5.1) | (5.1) |
| Total organic increase (decrease) | 6.3 | (52.1) | (45.8) |
| Impact of acquisitions | — | 42.4 | 42.4 |
| Impact of dispositions | (5.8) | (1.8) | (7.6) |
| Impact of FX | 41.4 | 17.5 | 58.9 |
| Total | $ 41.9 | $ 6.0 | $ 47.9 |

(a) The decrease in residential mobile non-subscription revenue is primarily attributable to (i) lower interconnect and mobile roaming revenue, largely driven by stay-at-home behaviors during the COVID-19 pandemic, and (ii) a decrease in revenue from mobile handset sales, due in large part to the impact of temporary retail store closures during the COVID-19 pandemic.

(b) The increase in B2B subscription revenue is primarily attributable to an increase in the average number of SOHO customers.

For information concerning certain regulatory developments that could have an adverse impact on our revenue in Belgium, see "*Belgium Regulatory Developments*" in note 19 to our consolidated financial statements.

*Switzerland.* The details of the increase in Switzerland's revenue during 2020, as compared to 2019, are set forth below:

| | Subscription revenue | Non-subscription revenue | Total |
|---|---|---|---|
| | | in millions | |
| Decrease in residential cable subscription revenue due to change in: | | | |
| Average number of customers | $ (61.1) | $ — | $ (61.1) |
| ARPU | (15.6) | — | (15.6) |
| Decrease in residential cable non-subscription revenue (a) | — | (10.6) | (10.6) |
| Total decrease in residential cable revenue | (76.7) | (10.6) | (87.3) |
| Increase in residential mobile revenue (b) | 15.5 | 2.7 | 18.2 |
| Increase (decrease) in B2B revenue | (1.0) | 0.5 | (0.5) |
| Increase in other revenue | — | 0.2 | 0.2 |
| Total organic decrease | (62.2) | (7.2) | (69.4) |
| Impact of acquisitions | 167.7 | 115.9 | 283.6 |
| Impact of FX | 72.6 | 28.2 | 100.8 |
| Total | $ 178.1 | $ 136.9 | $ 315.0 |

(a) The decrease in residential cable non-subscription revenue is primarily attributable to (i) a decrease in revenue associated with our Swiss sports channels, (ii) lower revenue from construction services provided to our partner networks and (iii) lower revenue from late fees.

(b) The increase in residential mobile subscription revenue is primarily due to an increase in the average number of mobile subscribers.

*Central and Eastern Europe.* The details of the increase in Central and Eastern Europe's revenue during 2020, as compared to 2019, are set forth below:

| | Subscription revenue | Non-subscription revenue | Total |
|---|---|---|---|
| | | in millions | |
| Increase in residential cable subscription revenue due to change in: | | | |
| Average number of customers | $ 6.0 | $ — | $ 6.0 |
| ARPU | 4.5 | — | 4.5 |
| Decrease in residential cable non-subscription revenue | — | (0.2) | (0.2) |
| Total increase (decrease) in residential cable revenue | 10.5 | (0.2) | 10.3 |
| Increase in residential mobile revenue | 1.7 | 0.4 | 2.1 |
| Increase in B2B revenue | 2.8 | 1.0 | 3.8 |
| Increase in other revenue | — | 0.4 | 0.4 |
| Total organic increase | 15.0 | 1.6 | 16.6 |
| Impact of FX | (5.0) | (0.1) | (5.1) |
| Total | $ 10.0 | $ 1.5 | $ 11.5 |

*Revenue — 2019 compared to 2018*

For discussion and analysis of the revenue of our consolidated reportable segments during 2019, as compared to 2018, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2019 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 — 2020 compared to 2019*

| | Year ended December 31, | | Increase (decrease) | | Organic increase (decrease) | |
|---|---|---|---|---|---|---|
| | 2020 | 2019 | $ | % | $ | % |
| | in millions, except percentages | | | | | |
| U.K./Ireland | $ 2,672.4 | $ 2,800.5 | $ (128.1) | (4.6) | $ (144.7) | (5.0) |
| Belgium | 1,413.4 | 1,386.1 | 27.3 | 2.0 | 12.4 | 0.9 |
| Switzerland | 693.8 | 627.9 | 65.9 | 10.5 | (76.5) | (12.2) |
| Central and Eastern Europe | 215.6 | 215.0 | 0.6 | 0.3 | 3.2 | 1.5 |
| Central and Corporate | (99.6) | (171.1) | 71.5 | 41.8 | (1.5) | (0.9) |
| Intersegment eliminations (a) | — | 1.1 | (1.1) | N.M. | (1.1) | N.M. |
| Total | $ 4,895.6 | $ 4,859.5 | $ 36.1 | 0.7 | $ (208.2) | (4.3) |

N.M. — Not Meaningful.

(a) The amount for the 2019 period includes transactions between our continuing and discontinued operations prior to the disposal dates of such discontinued operations.

*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, | |
|---|---|---|
| | 2020 | 2019 |
| U.K./Ireland | 40.6% | 42.4% |
| Belgium | 48.1% | 47.9% |
| Switzerland | 44.1% | 49.9% |
| Central and Eastern Europe | 44.3% | 45.2% |

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. 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 — 2019 compared to 2018*

For the details of our Adjusted EBITDA and Adjusted EBITDA margins during 2019, as compared to 2018, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2019 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.

### *2020 compared to 2019*

*Revenue*

Our revenue by major category is set forth below:

| | Year ended December 31, | | Increase (decrease) | | Organic increase (decrease) | |
|---|---|---|---|---|---|---|
| | 2020 | 2019 | $ | % | $ | % |
| | in millions, except percentages | | | | | |
| Residential revenue: | | | | | | |
| Residential cable revenue (a): | | | | | | |
| Subscription revenue (b): | | | | | | |
| Broadband internet | $ 3,272.5 | $ 3,187.4 | $ 85.1 | 2.7 | $ 9.9 | 0.3 |
| Video | 2,714.5 | 2,723.9 | (9.4) | (0.3) | (59.7) | (2.2) |
| Fixed-line telephony | 1,344.6 | 1,413.2 | (68.6) | (4.9) | (97.3) | (6.9) |
| Total subscription revenue | 7,331.6 | 7,324.5 | 7.1 | 0.1 | (147.1) | (2.0) |
| Non-subscription revenue | 220.7 | 198.1 | 22.6 | 11.4 | (6.5) | (3.3) |
| Total residential cable revenue | 7,552.3 | 7,522.6 | 29.7 | 0.4 | (153.6) | (2.0) |
| Residential mobile revenue (c): | | | | | | |
| Subscription revenue (b) | 1,091.8 | 932.1 | 159.7 | 17.1 | 20.1 | 2.2 |
| Non-subscription revenue | 692.0 | 688.2 | 3.8 | 0.6 | (54.1) | (7.9) |
| Total residential mobile revenue | 1,783.8 | 1,620.3 | 163.5 | 10.1 | (34.0) | (2.1) |
| Total residential revenue | 9,336.1 | 9,142.9 | 193.2 | 2.1 | (187.6) | (2.1) |
| B2B revenue (d): | | | | | | |
| Subscription revenue | 524.5 | 472.5 | 52.0 | 11.0 | 42.1 | 8.9 |
| Non-subscription revenue | 1,524.5 | 1,441.5 | 83.0 | 5.8 | 8.5 | 0.6 |
| Total B2B revenue | 2,049.0 | 1,914.0 | 135.0 | 7.1 | 50.6 | 2.6 |
| Other revenue (e) | 595.0 | 484.6 | 110.4 | 22.8 | (32.2) | (6.1) |
| Total | $ 11,980.1 | $ 11,541.5 | $ 438.6 | 3.8 | $ (169.2) | (1.5) |

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(a) Residential cable subscription revenue includes amounts received from subscribers for ongoing services and the recognition of deferred installation revenue over the associated contract period. Residential cable 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 cable 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 $227.9 million and $247.4 million during 2020 and 2019, respectively.

(d) B2B subscription revenue represents revenue from SOHO subscribers. 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 (i) revenue from business broadband internet, video, fixed-line telephony, mobile and data services offered to medium to large enterprises and, on a wholesale basis, to other operators and (ii) revenue from long-term leases of portions of our network.

(e) Other revenue includes, among other items, (i) broadcasting revenue in Belgium and Ireland, (ii) revenue earned from transitional and other services provided to various third parties and (iii) revenue earned from the JV Services and the sale of customer premises equipment to the VodafoneZiggo JV.

*Total revenue.* Our consolidated revenue increased $438.6 million or 3.8% during 2020, as compared to 2019. This increase includes an increase of $326.0 million attributable to the aggregate impact of the Sunrise Acquisition and the De Vijver Media Acquisition and a decrease of $7.6 million attributable to the impact of a disposition. On an organic basis, our consolidated revenue decreased $169.2 million or 1.5%.

*Residential revenue.* The details of the increase in our consolidated residential revenue during 2020, as compared to 2019, are as follows (in millions):

| | |
|---|---|
| Decrease in residential cable subscription revenue due to change in: | |
| Average number of customers | $ (62.4) |
| ARPU | (84.7) |
| Decrease in residential cable non-subscription revenue | (6.5) |
| Total decrease in residential cable revenue | (153.6) |
| Increase in residential mobile subscription revenue | 20.1 |
| Decrease in residential mobile non-subscription revenue | (54.1) |
| Total organic decrease in residential revenue | (187.6) |
| Impact of acquisitions and dispositions | 224.5 |
| Impact of FX | 156.3 |
| Total increase in residential revenue | $ 193.2 |

On an organic basis, our consolidated residential cable subscription revenue decreased $147.1 million or 2.0% during 2020, as compared to 2019, primarily attributable to decreases in Switzerland and U.K./Ireland.

On an organic basis, our consolidated residential cable non-subscription revenue decreased $6.5 million or 3.3% during 2020, as compared to 2019, primarily due to a decrease in Switzerland.

On an organic basis, our consolidated residential mobile subscription revenue increased $20.1 million or 2.2% during 2020, as compared to 2019, primarily attributable to an increase in Switzerland.

On an organic basis, our consolidated residential mobile non-subscription revenue decreased $54.1 million or 7.9% during 2020, as compared to 2019, primarily due to decreases in Belgium and U.K./Ireland.

*B2B revenue.* On an organic basis, our consolidated B2B subscription revenue increased $42.1 million or 8.9% during 2020, as compared to 2019, primarily due to increases in Belgium and U.K./Ireland.

On an organic basis, our consolidated B2B non-subscription revenue increased $8.5 million or 0.6% during 2020, as compared to 2019, primarily attributable to an increase in U.K./Ireland.

*Other revenue.* On an organic basis, our consolidated other revenue decreased $32.2 million or 6.1% during 2020, as compared to 2019, primarily attributable to (i) a decrease in revenue earned from sales of customer premises equipment to the VodafoneZiggo JV and (ii) lower 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. 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) | |
|---|---|---|---|---|---|---|
| | 2020 | 2019 | $ | % | $ | % |
| | in millions, except percentages | | | | | |
| U.K./Ireland | $ 2,053.8 | $ 2,058.3 | $ (4.5) | (0.2) | $ (19.7) | (1.0) |
| Belgium | 695.9 | 694.5 | 1.4 | 0.2 | (44.6) | (6.1) |
| Switzerland | 417.7 | 265.9 | 151.8 | 57.1 | 2.8 | 1.1 |
| Central and Eastern Europe | 124.8 | 116.1 | 8.7 | 7.5 | 10.2 | 8.8 |
| Central and Corporate | 149.3 | 104.3 | 45.0 | 43.1 | 30.8 | 29.5 |
| Intersegment eliminations | (4.5) | (0.4) | (4.1) | N.M. | (4.1) | N.M. |
| Total | $ 3,437.0 | $ 3,238.7 | $ 198.3 | 6.1 | $ (24.6) | (0.8) |

N.M. — Not Meaningful.

Our programming and other direct costs of services increased $198.3 million or 6.1% during 2020, as compared to 2019. This increase includes an increase of $153.0 million attributable to the aggregate impact of the Sunrise Acquisition and the De Vijver Media Acquisition. On an organic basis, our programming and other direct costs of services decreased $24.6 million or 0.8%. This decrease includes the following factors:

- A decrease in programming and copyright costs of $39.5 million or 2.4%, attributable to lower costs for certain premium and/or basic content, as decreases in U.K./Ireland and Switzerland were only partially offset by an increase in Poland. The decrease in U.K./Ireland is due to aggregate credits or rebates of $52.0 million received in connection with the loss of exclusive programming content due to the COVID-19 pandemic, which generally offset the aforementioned adverse revenue impacts in U.K./Ireland resulting from the COVID-19 pandemic;

- The impact of the classification of costs associated with the delivery of certain transitional services provided by Central and Corporate to various third parties in connection with our recent dispositions. Beginning on the effective dates of the underlying agreements, these costs became direct costs of services, which resulted in an increase in direct costs of $25.2 million that was fully offset by decreases in various other operating and SG&A expenses within Central and Corporate, as further discussed below;

- A decrease in interconnect and access costs of $23.4 million or 2.8%, primarily due to the net effect (i) lower interconnect and mobile roaming costs and (ii) higher MVNO costs in Switzerland and U.K./Ireland. The lower interconnect and mobile roaming costs are primarily attributable to a decrease in Belgium that was only partially offset by an increase in U.K./Ireland. Across all of our markets, interconnect and mobile roaming costs have been impacted by changes in usage per mobile subscriber associated with factors such as lower travel and the use of WiFi alternatives during stay-at-home mandates or recommendations as a result of the COVID-19 pandemic; and

- A decrease in mobile handset and other device costs of $20.1 million or 5.3%, primarily due to lower sales volumes in U.K./Ireland and Belgium, largely due to certain retail store closures as a result of the COVID-19 pandemic.

*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) | |
|---|---|---|---|---|---|---|
| | 2020 | 2019 | $ | % | $ | % |
| | in millions, except percentages | | | | | |
| U.K./Ireland | $ 1,010.6 | $ 904.0 | $ 106.6 | 11.8 | $ 98.9 | 10.9 |
| Belgium | 416.2 | 389.1 | 27.1 | 7.0 | 15.9 | 4.1 |
| Switzerland | 210.5 | 178.9 | 31.6 | 17.7 | (6.1) | (3.4) |
| Central and Eastern Europe | 68.5 | 70.9 | (2.4) | (3.4) | (1.9) | (2.7) |
| Central and Corporate | 61.0 | 102.2 | (41.2) | (40.3) | (39.2) | (38.4) |
| Intersegment eliminations | 2.8 | (7.7) | 10.5 | N.M. | 10.5 | N.M. |
| Total other operating expenses excluding share-based compensation expense | 1,769.6 | 1,637.4 | 132.2 | 8.1 | $ 78.1 | 4.8 |
| Share-based compensation expense | 7.6 | 3.9 | 3.7 | 94.9 | | |
| Total | $ 1,777.2 | $ 1,641.3 | $ 135.9 | 8.3 | | |

N.M. — Not Meaningful.

Our other operating expenses (exclusive of share-based compensation expense) increased $132.2 million or 8.1% during 2020, as compared to 2019. This increase includes an increase of $29.3 million attributable to the aggregate impact of the Sunrise Acquisition and the De Vijver Media Acquisition. On an organic basis, our other operating expenses increased $78.1 million or 4.8%. This increase includes the following factors:

- An increase in personnel costs of $34.9 million or 7.3%, primarily due to the net effect of (i) higher staffing levels in U.K./Ireland and Belgium that were only partially offset by lower staffing levels in Switzerland, (ii) lower average costs per employee, primarily due to decreases in U.K./Ireland and Belgium that were only partially offset by an increase in Switzerland, (iii) a decrease in temporary personnel costs, primarily in U.K./Ireland and (iv) lower costs due to higher capitalizable activities, primarily in U.K./Ireland. The increase in personnel costs in U.K./Ireland also includes the impact of higher costs associated with regulated contract notifications, as further described in note 19 to our consolidated financial statements;

- The aforementioned impact of the classification of costs associated with the delivery of certain transitional services provided by Central and Corporate to various third parties in connection with our recent dispositions. Beginning on the effective dates of the underlying agreements, these costs became direct costs of services, which resulted in a decrease in various other operating expenses of $24.2 million within Central and Corporate;

- An increase in network infrastructure charges in U.K./Ireland of $20.1 million following an increase in the rateable value of certain of Virgin Media's assets. For additional information, see "*Other Regulatory Issues*" in note 19 to our consolidated financial statements;

- An increase in other operating expenses due to $19.5 million recognized during the third quarter of 2020 in U.K./ Ireland associated with the completion of the VM Receivables Financing Sale, representing the difference between the carrying amount of the associated receivables and the amount received pursuant to the sale;

- Higher costs in U.K./Ireland associated with a $15.9 million charge recorded during the third quarter of 2020 in connection with the reassessment of certain items related to prior years;

- A decrease in customer service costs of $10.3 million or 4.1%, primarily due to lower external call center costs in U.K./Ireland. The lower call center costs in U.K./Ireland include the impact of lockdowns during the second and, to a lesser extent, third quarter of 2020 associated with the COVID-19 pandemic, which prevented certain outsourced contract services from being performed; and

- An increase in core network and information technology-related costs of $7.0 million or 2.5%, primarily due to the net effect of (i) higher information technology-related expenses, primarily due to an increase in Central and Corporate that was only partially offset by a decrease in Switzerland, (ii) lower network maintenance costs, primarily due to a decrease in Central and Corporate that was only partially offset by increases in U.K./Ireland and Switzerland and (iii) an increase in leased bandwidth and outsourced data center costs in Central and Corporate.

*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) | |
|---|---|---|---|---|---|---|
| | 2020 | 2019 | $ | % | $ | % |
| | in millions, except percentages | | | | | |
| U.K./Ireland | $ 851.6 | $ 837.5 | $ 14.1 | 1.7 | $ 7.4 | 0.9 |
| Belgium | 415.4 | 423.3 | (7.9) | (1.9) | (29.5) | (6.8) |
| Switzerland | 251.8 | 186.1 | 65.7 | 35.3 | 10.4 | 5.6 |
| Central and Eastern Europe | 78.0 | 73.4 | 4.6 | 6.3 | 5.1 | 6.9 |
| Central and Corporate | 283.7 | 281.0 | 2.7 | 1.0 | (0.7) | (0.2) |
| Intersegment eliminations | (2.6) | 4.6 | (7.2) | N.M. | (7.2) | N.M. |
| Total SG&A expenses excluding share-based compensation expense | 1,877.9 | 1,805.9 | 72.0 | 4.0 | $ (14.5) | (0.8) |
| Share-based compensation expense | 340.4 | 301.9 | 38.5 | 12.8 | | |
| Total | $ 2,218.3 | $ 2,107.8 | $ 110.5 | 5.2 | | |

N.M. — Not Meaningful.

*Supplemental SG&A expense information:*

| | Year ended December 31, | | Increase | | Organic increase (decrease) | |
|---|---|---|---|---|---|---|
| | 2020 | 2019 | $ | % | $ | % |
| | in millions, except percentages | | | | | |
| General and administrative (a) | $ 1,453.6 | $ 1,400.4 | $ 53.2 | 3.8 | $ (11.5) | (0.8) |
| External sales and marketing | 424.3 | 405.5 | 18.8 | 4.6 | (3.0) | (0.7) |
| Total | $ 1,877.9 | $ 1,805.9 | $ 72.0 | 4.0 | $ (14.5) | (0.8) |

(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 $72.0 million or 4.0% during 2020, as compared to 2019. This increase includes an increase of $52.8 million attributable to the aggregate impact of the Sunrise Acquisition and the De Vijver Media Acquisition. On an organic basis, our SG&A expenses decreased $14.5 million or 0.8%. This decrease includes the following factors:

- A decrease in customer service costs of $10.3 million or 26.4%, primarily due to lower external call center costs in Belgium and U.K./Ireland;

- An increase in business service costs of $8.5 million or 4.6%, primarily due to the net effect of (i) higher consulting costs, primarily due to increases in U.K./Ireland, Central and Corporate and Switzerland that were only partially offset by a decrease in Belgium, (ii) a decrease in travel and entertainment expenses and (iii) a decrease in vehicle expenses, primarily in U.K./Ireland and Belgium;

- A decrease in property costs of $8.8 million or 8.7%, primarily due to lower rent expense resulting from retail store closures in U.K./Ireland;

- A decrease in external sales and marketing costs of $3.0 million or 0.7%, primarily due to the net effect of (i) lower costs associated with third-party sales commissions in Belgium and (ii) higher costs associated with advertising campaigns, primarily due to increases in U.K./Ireland and Poland that were only partially offset by decreases in Switzerland and Belgium. The increase in costs associated with advertising campaigns in U.K./Ireland includes higher costs associated with regulated contract notifications, as further described in note 19 to our consolidated financial statements; and

- An increase in personnel costs of $2.2 million or 0.3%, primarily due to the net effect of (i) higher staffing levels, primarily due to an increase in Central and Corporate that was only partially offset by decreases in U.K./Ireland and Belgium, (ii) lower average costs per employee, primarily due to a decrease in Central and Corporate that was only partially offset by increases in U.K./Ireland and Belgium, (iii) a decrease in temporary personnel costs, primarily due to a decrease in U.K./Ireland that was only partially offset by an increase in Belgium and (iv) higher incentive compensation costs, primarily in U.K./Ireland. The lower average cost per employee includes the impact of (a) lower severance costs in U.K./Ireland of $6.3 million associated with severance payments recorded during the second quarter of 2019 in connection with revisions to our operating model and decreases in senior management personnel and (b) a decrease in Central and Corporate related to a $5.0 million cash bonus paid in the second quarter of 2019 associated with the renewal of an existing executive employment contract on similar terms.

*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, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Liberty Global: | | |
| Performance-based incentive awards (a) | $ 127.4 | $ 134.5 |
| Non-performance based incentive awards (b) | 134.1 | 107.6 |
| Other (c) | 46.2 | 39.0 |
| Total Liberty Global | 307.7 | 281.1 |
| Telenet share-based incentive awards (d) | 35.5 | 15.6 |
| Other | 4.8 | 9.1 |
| Total | $ 348.0 | $ 305.8 |
| Included in: | | |
| Other operating expenses | $ 7.6 | $ 3.9 |
| Total SG&A expenses | 340.4 | 301.9 |
| Total | $ 348.0 | $ 305.8 |

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(a) Includes share-based compensation expense related to (i) PSUs, (ii) the 2019 Challenge Performance Awards and (iii) the performance-based portion of the 2019 CEO Performance Award.

(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 2020, the compensation committee of our board of directors approved the extension of the expiration dates of outstanding SARs and director options granted in 2013 from a 7-year term to a 10-year term in order to align with this new policy. Accordingly, the Black-Scholes fair values of the outstanding awards increased, resulting in the recognition of an aggregate incremental share-based compensation expense of $18.9 million during the second quarter of 2020. The 2019 amount includes share-based compensation expense related to the RSAs issued under the 2019 CEO Performance Award.

(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, 2020, included performance- and non-performance-based stock option awards with respect to 5,001,814 Telenet shares. These stock option awards had a weighted average exercise price of €40.69 ($49.74).

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 $2,331.3 million and $3,652.2 million during 2020 and 2019, respectively. Excluding the effects of FX, depreciation and amortization expense decreased $1,368.8 million or 37.5% during 2020, as compared to 2019. This decrease is primarily due to the net effect of (i) a decrease in U.K./Ireland of $1,051.4 million as a result of the held-for-sale presentation of the U.K. JV Entities effective May 7, 2020, (ii) a decrease associated with certain assets becoming fully depreciated, primarily in U.K./Ireland, Central and Corporate, Belgium and Switzerland, (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 and (iv) a decrease due to assets becoming fully amortized, primarily in U.K./Ireland. For information regarding the held-for-sale presentation of the U.K. JV Entities, 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 $98.6 million during 2020, as compared to $156.0 million during 2019.

The 2020 amount primarily includes (i) direct acquisition and disposition costs of $76.9 million, primarily related to costs incurred in connection with the Sunrise Acquisition and the pending formation of the U.K. 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, U.K./Ireland and Belgium, (iii) a $42.0 million gain in Belgium during 2020 associated with the disposal of certain content assets and liabilities and (iv) impairment charges of  $13.8 million, respectively, primarily in Belgium and U.K./Ireland.

The 2019 amount primarily includes (i) restructuring charges of $89.9 million, including $84.3 million of employee severance and termination costs related to certain reorganization activities, primarily in U.K./Ireland, Central and Corporate and Switzerland, (ii) a net provision for litigation of £41.3 million ($54.0 million at the applicable rate) related to a VAT matter in the U.K. recorded during the fourth quarter of 2019, (iii) impairment charges of $34.2 million, primarily related to the write-off of certain network assets in U.K./Ireland, and (iv) an aggregate credit related to direct acquisition and disposition costs of $18.1 million, primarily related to the net effect of (a) a $50.4 million cash termination fee received from Sunrise during the fourth quarter in connection with the termination of a share purchase agreement to sell our operations in Switzerland (the **Sunrise SPA**) and (b) costs incurred in connection with (1) the sales of the Vodafone Disposal Group and UPC DTH and (2) the Sunrise SPA.

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 restructuring charges, see note 16 to our consolidated financial statements. For additional information regarding the aforementioned VAT matter in the U.K., see note 19 to our consolidated financial statements. 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 $1,188.5 million and $1,385.9 million during 2020 and 2019, respectively, including interest expense of the U.K. JV Entities. Excluding the effects of FX, interest expense decreased $230.8 million or 16.7% during 2020, as compared to 2019. This decrease is primarily attributable to (i) a lower weighted average interest rate and (ii) a slightly lower average outstanding debt balance. 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 losses on derivative instruments, net, for the indicated periods are as follows:

| | Year ended December 31, | |
|---|---|---|
| | **2020** | **2019** |
| | **in millions** | |
| Cross-currency and interest rate derivative contracts (a) | $ (1,184.3) | $ (207.3) |
| Equity-related derivative instruments: | | |
| ITV Collar | 364.2 | (84.4) |
| Lionsgate Forward | 0.8 | 13.0 |
| Other | 21.7 | 8.0 |
| Total equity-related derivative instruments (b) | 386.7 | (63.4) |
| Foreign currency forward and option contracts | (81.1) | 77.4 |
| Other | (0.6) | 1.3 |
| Total | $ (879.3) | $ (192.0) |

(a) The loss during 2020 is attributable to net losses associated with (i) changes in the relative value of certain currencies and (ii) changes in 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. The loss during 2019 is attributable to net losses associated with (a) changes in certain market interest rates and (b) changes in the relative value of certain currencies. In addition, the loss during 2019 includes a net gain of $16.6 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 losses, net, for the indicated periods are as follows:

| | Year ended December 31, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Intercompany payables and receivables denominated in a currency other than the entity's functional currency (a) | $ (1,887.0) | $ (116.7) |
| U.S. dollar denominated debt issued by euro functional currency entities | 433.8 | (110.3) |
| Cash and restricted cash denominated in a currency other than the entity's functional currency | (131.2) | — |
| British pound sterling denominated debt issued by a U.S. dollar functional currency entity | 88.9 | (51.3) |
| U.S. dollar denominated debt issued by British pound sterling functional currency entities | 50.7 | 215.6 |
| Euro denominated debt issued by British pound sterling functional currency entities | 30.5 | (30.3) |
| Other | (2.0) | (1.8) |
| Total | $ (1,416.3) | $ (94.8) |

(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 (losses) 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, for the indicated periods are as follows:

| | Year ended December 31, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Investments: | | |
| Skillz | $ 238.0 | $ 1.1 |
| ITV | (217.1) | 163.9 |
| EdgeConneX | 33.1 | — |
| CANAL+ Polska | (26.3) | 2.7 |
| SMAs | 5.2 | — |
| Lionsgate | 4.0 | (25.0) |
| Other, net | (1.1) | (43.7) |
| Total investments | 35.8 | 99.0 |
| Debt | 9.4 | (27.0) |
| Total | $ 45.2 | $ 72.0 |

*Losses on debt extinguishment, net*

We recognized net losses on debt extinguishment of $233.2 million and $216.7 million during 2020 and 2019, respectively.

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.

The loss during 2019 is primarily attributable to (i) the payment of $172.2 million of redemption premiums and (ii) the write-off of $42.5 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, | |
|---|---|---|
| | **2020** | **2019** |
| | **in millions** | |
| VodafoneZiggo JV (a) | $ (201.1) | $ (185.9) |
| All3Media | (27.9) | (8.8) |
| Formula E | (8.4) | 1.7 |
| Other | (7.9) | (5.5) |
| Total | $ (245.3) | $ (198.5) |

(a) Amounts include the net effect of (i) our 50% share of the results of operations of the VodafoneZiggo JV and (ii) interest income of $48.0 million and $50.4 million, respectively, representing 100% of the interest earned on the VodafoneZiggo JV Receivables. The summarized results of operations of the VodafoneZiggo JV are set forth below:

| | Year ended December 31, | |
|---|---|---|
| | **2020** | **2019** |
| | **in millions** | |
| Revenue | $ 4,565.4 | $ 4,407.8 |
| Adjusted EBITDA | $ 2,142.0 | $ 1,987.7 |
| Operating income (1) | $ 283.7 | $ 119.1 |
| Non-operating expense (2) | $ (570.9) | $ (631.6) |
| Net loss | $ (448.7) | $ (470.0) |

(1) Includes depreciation and amortization of $1,871.4 million and $1,822.1 million, respectively.

(2) Includes interest expense of $598.6 million and $647.3 million, respectively.

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

*Other income, net*

We recognized other income, net, of $76.1 million and $114.4 million during 2020 and 2019, respectively. These amounts include (i) interest and dividend income of $57.1 million and $77.8 million, respectively, (ii) credits related to the non-service components of our net periodic pension costs of $16.7 million and $12.7 million, respectively. In addition, other income, net, includes (a) for 2020, a $15.3 million gain related to certain assets that were contributed to a joint venture and (b) for 2019, a

$25.7 million gain associated with the De Vijver Media Acquisition, representing the difference between the fair value and carrying amount of our then-existing 50% ownership interest in De Vijver Media.

*Income tax expense*

We recognized income tax benefit (expense) of $256.9 million and ($253.0 million) during 2020 and 2019, respectively.

The income tax benefit during 2020 differs from the expected income tax benefit of $327.5 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.

The income tax expense during 2019 differs from the expected income tax benefit of $219.6 million (based on the U.K. statutory income tax rate of 19.0%) primarily due to the net negative impact of (i) certain permanent differences between the financial and tax accounting treatment of (a) interest and other items and (b) items associated with investments in subsidiaries, and (ii) a net increase in valuation allowances.

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

*Loss from continuing operations*

During 2020 and 2019, we reported losses from continuing operations of $1,466.7 million and $1,409.0 million, respectively, consisting of (i) operating income of $2,117.7 million and $745.5 million, respectively, (ii) net non-operating expense of $3,841.3 million and $1,901.5 million, respectively, and (iii) income tax expense of $256.9 million and $253.0 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 expenses.

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 $730.3 million during 2019 related to the operations of the Vodafone Disposal Group and UPC DTH. In addition, we recognized a gain of $12.2 billion related to the third quarter 2019 sale of the Vodafone Disposal Group and a gain of $106.0 million related to the second quarter 2019 sale of UPC DTH. For additional information, see note 6 to our consolidated financial statements.

*Net earnings attributable to noncontrolling interests*

Net earnings attributable to noncontrolling interests includes the noncontrolling interests' share of the results of our continuing and discontinued operations. Our net earnings attributable to noncontrolling interests were $161.3 million and $116.8 million during 2020 and 2019, respectively. The increase is primarily attributable to the results of operations of Telenet.

***2019 compared to 2018***

For information regarding the discussion and analysis of our consolidated operating results during 2019, as compared to 2018, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2019 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 Telenet, Virgin Media and UPC Holding. 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, 2020 are set forth in the following table (in millions):

| | |
|---|---|
| Cash and cash equivalents held by: | |
| Liberty Global and unrestricted subsidiaries: | |
| Liberty Global (a) | $ 33.1 |
| Unrestricted subsidiaries (b) | 1,132.4 |
| Total Liberty Global and unrestricted subsidiaries | 1,165.5 |
| Borrowing groups (c): | |
| Telenet | 100.2 |
| UPC Holding | 31.4 |
| Virgin Media (d) | 30.1 |
| Total borrowing groups | 161.7 |
| Total cash and cash equivalents | $ 1,327.2 |

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(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) Except as otherwise noted, represents the aggregate amounts held by the parent entity and restricted subsidiaries of our borrowing groups.

(d) Represents the cash and cash equivalents of the Virgin Media borrowing group, which includes (i) certain subsidiaries of Virgin Media, but excludes the parent entity, Virgin Media Inc., and (ii) the cash and cash equivalents of the U.K. JV Entities, as such cash and cash equivalents will be retained by Liberty Global upon the formation of the U.K. JV and are therefore not classified as held for sale. Amount excludes the Escrowed Proceeds associated with the VM O2 Notes. For information regarding the held-for-sale presentation of the U.K. JV Entities and the Escrowed Proceeds, see notes 6 and 11, respectively, to our consolidated financial statements.

*Liquidity of Liberty Global and its unrestricted subsidiaries*

The $33.1 million of cash and cash equivalents held by Liberty Global and, subject to certain tax and legal considerations, the $1,132.4 million of aggregate cash and cash equivalents held by unrestricted subsidiaries, together with the $1,965.9 million of investments held under SMAs, represented available liquidity at the corporate level at December 31, 2020. Our remaining cash and cash equivalents of $161.7 million at December 31, 2020 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, 2020, see note 11 to our consolidated financial statements.

Our current 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, (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) 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 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, 2020, our consolidated cash and cash equivalents balance included $1,282.7 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, for information regarding certain limitations imposed by our subsidiaries' debt instruments at December 31, 2020, see note 11 to our consolidated financial statements.

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 corporate liquidity requirements include (i) corporate general and administrative expenses, (ii) interest payments on the ITV Collar Loan and (iii) principal payments on the ITV Collar Loan to the extent not settled through the delivery of the underlying shares. In addition, Liberty Global and its unrestricted subsidiaries may require cash in connection with (a) the repayment of third-party and intercompany debt, (b) the satisfaction of contingent liabilities, (c) acquisitions, (d) the repurchase of equity and debt securities, (e) other investment opportunities, (f) any funding requirements of our subsidiaries and affiliates or (g) 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 $9.3 billion at December 31, 2020 with varying maturity dates).

During 2020, the aggregate amount of our share repurchases, including direct acquisition costs, was $1,072.3 million. At December 31, 2020, the remaining amount authorized for share repurchases was $1.0 billion. As a U.K. incorporated company, we may only elect to repurchase shares or pay dividends to the extent of our Distributable Reserves. For additional information regarding our share repurchase programs, see note 14 to our consolidated financial statements.

For information regarding the liquidity impacts of the Sunrise Acquisition, see note 5 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, 2020, 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, 2020 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 19 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 (excluding the ITV Collar Loan and 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, 2020, 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, 2020, the outstanding principal amount of our consolidated debt, together with our finance lease obligations, aggregated $15.1 billion, including $1.1 billion that is classified as current on our consolidated balance sheet and $13.1 billion that is not due until 2026 or thereafter. All of our consolidated debt and finance lease obligations have been borrowed or incurred by our subsidiaries at December 31, 2020.

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 information regarding potential impacts of the COVID-19 pandemic on our company's liquidity, see the discussion included above in *Overview*. 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 — 2020 compared to 2019*

*Summary.* The 2020 and 2019 consolidated statements of cash flows of our continuing operations are summarized as follows:

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | Change |
| | in millions | | |
| Net cash provided by operating activities | $ 4,185.8 | $ 3,714.1 | $ 471.7 |
| Net cash provided (used) by investing activities | (8,874.0) | 9,541.0 | (18,415.0) |
| Net cash provided (used) by financing activities | 1,083.6 | (6,922.3) | 8,005.9 |
| Effect of exchange rate changes on cash and cash equivalents and restricted cash | 141.0 | 0.4 | 140.6 |
| Net increase (decrease) in cash and cash equivalents and restricted cash | $ (3,463.6) | $ 6,333.2 | $ (9,796.8) |

*Operating Activities.* The increase in net cash provided by our operating activities is primarily attributable to the net effect of (i) an increase in the reported cash provided by operating activities due to FX, (ii) a decrease in the cash provided by our Adjusted EBITDA and related working capital items, which includes an increase in cash of $272.1 million (at the applicable rate) in connection with the VM Receivables Financing Sale, (iii) an increase in cash provided due to lower payments of interest, (iv) a decrease in cash provided due to higher cash payments related to derivative instruments, (v) an increase in cash provided due to lower payments for taxes and (vi) an increase in cash provided due to higher cash received from dividends. 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 change in net cash provided (used) by our investing activities is primarily attributable to the net effect of (i) a decrease in cash of $11,203.1 million as a result of higher net cash proceeds received from the sale of discontinued operations during 2019, (ii) a decrease in cash of $5,244.7 million associated with higher net cash paid for acquisitions, primarily related to the Sunrise Acquisition, (iii) a decrease in cash of $2,114.8 million associated with higher net cash paid for investments, primarily related to our investments held under SMAs, (iv) an increase in cash of $400.1 million as a result of cash released from the Vodafone Escrow Accounts and (v) a decrease in cash of $107.1 million due to higher capital expenditures. Capital expenditures increased from $1,243.1 million during 2019 to $1,350.2 million during 2020 primarily attributable to an increase due to lower proceeds received for transfers to related parties.

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 20 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, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Property and equipment additions | $ 2,695.3 | $ 2,880.5 |
| Assets acquired under capital-related vendor financing arrangements | (1,371.1) | (1,727.0) |
| Assets acquired under finance leases | (49.7) | (66.9) |
| Changes in current liabilities related to capital expenditures | 75.7 | 156.5 |
| Capital expenditures, net | $ 1,350.2 | $ 1,243.1 |
| | | |
| Capital expenditures, net: | | |
| Third-party payments | $ 1,352.7 | $ 1,323.9 |
| Proceeds received for transfers to related parties (a) | (2.5) | (80.8) |
| Total capital expenditures, net | $ 1,350.2 | $ 1,243.1 |

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(a) Primarily relates to transfers of centrally-procured property and equipment to the VodafoneZiggo JV and our discontinued operations, as applicable.

The decrease in our property and equipment additions during 2020 is due to (i) a decrease in local currency expenditures of our subsidiaries due to the net effect of (a) a decrease in expenditures for the purchase and installation of customer premises equipment, (b) a decrease in baseline expenditures, including network improvements and expenditures for property and facilities and information technology systems, (c) a decrease in expenditures for new build and upgrade projects, (d) an increase due to the Sunrise Acquisition and (e) an increase in expenditures to support new customer products and operational efficiency initiatives and (ii) an increase due to FX. During 2020 and 2019, our property and equipment additions represented 22.5% and 25.0% of revenue, respectively.

We expect our 2021 property and equipment additions to remain relatively stable as compared to our 2020 property and equipment additions. The actual amount of our 2021 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 an increase in cash of (i) $6,207.7 million due to higher net borrowings of debt and (ii) $2,147.1 million due to lower repurchases of Liberty Global ordinary shares.

*Consolidated Statements of Cash Flows — 2019 compared to 2018*

For information regarding (i) the consolidated statements of cash flows of our continuing operations for 2019, as compared to 2018, and (ii) our adjusted free cash flow for 2018, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2019 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 (i) cash payments for third-party costs directly associated with successful and unsuccessful acquisitions and dispositions and (ii) expenses financed by an intermediary, less (a) capital expenditures, as reported in our consolidated statements of cash flows, (b) principal payments on amounts financed by vendors and intermediaries and (c) principal payments on finance leases (exclusive of the portions of the network lease in Belgium that we assumed in connection with an acquisition), with each item excluding any cash provided or used by our discontinued operations. We believe our presentation of adjusted free cash flow provides useful information to our investors because this measure can be used to gauge our ability to service debt and fund new investment opportunities. Adjusted free cash flow, which is a non-GAAP measure, 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 this amount. 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.

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

| | Year ended December 31, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Net cash provided by operating activities of our continuing operations (a) | $ 4,185.8 | $ 3,714.1 |
| Cash payments (receipts) for direct acquisition and disposition costs | 34.7 | (13.5) |
| Expenses financed by an intermediary (b) | 2,770.0 | 2,171.4 |
| Capital expenditures, net | (1,350.2) | (1,243.1) |
| Principal payments on amounts financed by vendors and intermediaries | (4,506.0) | (3,934.7) |
| Principal payments on certain finance leases | (64.5) | (62.9) |
| Adjusted free cash flow | $ 1,069.8 | $ 631.3 |

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(a) The 2019 amount includes interest payments related to debt that was repaid in connection with the completion of the disposition of the Vodafone Disposal Group. These interest payments were not allocated to discontinued operations.

(b) For purposes of our consolidated statements of cash flows, expenses financed by an intermediary are treated as hypothetical operating cash outflows and hypothetical financing cash inflows when the expenses are incurred. 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 add back the hypothetical operating cash outflow when these financed expenses are incurred and deduct the financing cash outflows when we pay the financing intermediary.

## 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 36.2% of our total assets at December 31, 2020.

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 2020 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, 2020, 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 cable and mobile transmission and distribution facilities and the installation of new cable services. Installation activities that are capitalized include (i) the initial connection (or drop) from our cable system to a customer location, (ii) the replacement of a drop and (iii) the installation of equipment for additional services, such as digital cable, telephone or broadband internet service. 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, our fair value method investments and certain instruments that we classify as debt, each of which are carried at fair value. 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, fair value method investments and certain instruments that we classify as debt have had, and we believe will continue to have, a significant and volatile impact on our results of operations. During 2020, 2019 and 2018, we recognized net gains (losses) of ($834.1 million), ($120.0 million) and $741.3 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, 2020.

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 and (ii) impairment assessments, both 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, 2020, the aggregate valuation allowance provided against deferred tax assets was $1,578.9 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, 2020 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, 2020, the amount of unrecognized tax benefits for financial reporting purposes, but taken or expected to be taken in our tax returns, was $604.9 million, of which $421.5 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, 2020, $723.1 million or 54.5%, $427.8 million or 32.2% and $143.8 million or 10.8% of our consolidated cash balances were denominated in U.S. dollars, British pound sterling and euros, respectively.

We are exposed to market price fluctuations related to our investment in ITV shares, which had an aggregate fair value of $581.0 million at December 31, 2020. Certain of our ITV shares are held through the ITV Collar. For information concerning the terms of the ITV Collar and ITV Collar Loan, see note 8 to our consolidated financial statements. For those shares that are held through the ITV Collar, our exposure to market risk is limited. For additional information concerning our investment in ITV shares, see note 7 to our consolidated financial statements.

### *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, 2020, 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 also are 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, 2020 was to the British pound sterling, euro and Swiss franc as 47.3%, 30.6% and 18.8% of our reported revenue during the period was derived from subsidiaries whose functional currencies are the British pound sterling, euro and Swiss franc, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for the Swiss franc and 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, | |
|---|---|---|
| | **2020** | **2019** |
| **Spot rates:** | | |
| Euro | 0.8180 | 0.8906 |
| British pound sterling | 0.7325 | 0.7540 |
| Swiss franc | 0.8852 | 0.9664 |
| Polish zloty | 3.7363 | 3.7906 |

| | Year ended December 31, | | |
|---|---|---|---|
| | **2020** | **2019** | **2018** |
| **Average rates:** | | | |
| Euro | 0.8775 | 0.8933 | 0.8472 |
| British pound sterling | 0.7796 | 0.7835 | 0.7498 |
| Swiss franc | 0.9389 | 0.9937 | 0.9781 |
| Polish zloty | 3.8979 | 3.8388 | 3.6108 |

***Inflation and Foreign Investment Risk***

We are subject to inflationary pressures with respect to labor, programming and other costs. 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. We also use (i) purchased interest rate cap and collar agreements and swaptions to 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, and (ii) purchased interest rate floor agreements to protect against interest rates falling below a certain level, generally to match a floating rate floor on a debt instrument. Under our current guidelines, we use various interest rate derivative instruments to mitigate interest rate risk, generally for five years, with the later years covered primarily by swaptions. As such, the final maturity dates of our various portfolios of interest rate derivative instruments generally 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) has announced that measures will need to be undertaken by the end of 2021 to reform EURIBOR to ensure compliance with 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 GBP LIBOR rates, it intends to cease publishing 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, it is not possible to predict the exact transitional arrangements for calculating applicable reference rates that may be made in the U.K., the U.S., the Eurozone or elsewhere given that a number of outcomes are possible, including the cessation of the publication of one or more reference rates.

In October 2020, the International Swaps and Derivatives Association (the ISDA) launched a new supplement (the Fallback Supplement), which effective January 25, 2021, will amend the standard definitions for interest rate derivatives to incorporate fallbacks for derivatives linked to certain key interbank offered rates (IBORs). The ISDA also launched a new protocol (the Fallback Protocol), also effective January 25, 2021, that will enable 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 will apply following a permanent cessation of the IBOR in that currency and will be adjusted versions of the risk-free rates identified in each currency. Our loan documents 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 loan documents 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 than any new reference rate that applies to our LIBOR-indexed or EURIBOR-indexed derivative instruments. We anticipate managing 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 the company may incur significant associated costs.

*Weighted Average Variable Interest Rate.* At December 31, 2020, the outstanding principal amount of our variable-rate indebtedness aggregated $9.8 billion, and the weighted average interest rate (including margin) on such variable-rate indebtedness was approximately 2.8%, 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 $49.0 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. With the exception of a limited number of instances where we have required a counterparty to post collateral, neither party has posted collateral under the derivative instruments of our subsidiary borrowing groups. 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 credit 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, 2020, our exposure to counterparty credit risk included (i) derivative assets with an aggregate fair value of $83.2 million, (ii) cash and cash equivalent and restricted cash balances of $4,717.3 million and (iii) aggregate undrawn debt facilities of $1,554.5 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, 2020:

(i) 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 €460 million ($562 million);

(ii) 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 €349 million ($427 million); and

(iii) an instantaneous increase (decrease) in the relevant base rate of 50 basis points (0.50%) would have increased (decreased) the aggregate fair value of the UPC Holding cross-currency and interest rate derivative contracts by approximately €109 million ($133 million).

*Telenet Cross-currency and Interest Rate Derivative Contracts*

Holding all other factors constant, at December 31, 2020:

(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 €362 million ($442 million); and

(ii) an instantaneous increase (decrease) in the relevant base rate of 50 basis points (0.50%) would have increased (decreased) the aggregate fair value of the Telenet cross-currency and interest rate derivative contracts by approximately €94 million ($114 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, 2020. These amounts are presented for illustrative purposes only and will likely differ from the actual cash payments or receipts required in future periods. As a result of the held-for-sale presentation of the debt and finance lease obligations of the U.K. JV Entities on our December 31, 2020 consolidated balance sheet, the amounts presented below do not include projected derivative cash flows related to the U.K. JV Entities. For information regarding the held-for-sale presentation of the U.K. JV Entities, see note 6 to our consolidated financial statements. 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: | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2021 | 2022 | 2023 | 2024 | 2025 | Thereafter | Total |
| | | | | in millions | | | |
| Projected derivative cash payments (receipts), net: | | | | | | | |
| Interest-related (a) | $ 38.8 | $ 77.9 | $ 34.0 | $ 0.5 | $ (21.7) | $ (121.8) | $ 7.7 |
| Principal-related (b) | (12.2) | — | 69.6 | (42.9) | 64.7 | 337.3 | 416.5 |
| Other (c) | — | (49.2) | (130.9) | (0.1) | — | — | (180.2) |
| Total | $ 26.6 | $ 28.7 | $ (27.3) | $ (42.5) | $ 43.0 | $ 215.5 | $ 244.0 |

(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 our equity-related derivative instruments and foreign currency forward contracts. We may elect to use cash or the collective value of the related shares and equity-related derivative instrument to settle the ITV Collar Loan.

## Item 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The consolidated financial statements of Liberty Global are filed under this Item, beginning on page II-45. 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, 2020. 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, 2020, 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-42.

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

The audit report of KPMG LLP is included herein on page II-43.

*(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.

## 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, 2020, 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, 2020. 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. In November 2020, we acquired Sunrise Communications Group AG (**Sunrise**). Our evaluation of internal control over financial reporting did not include the internal control of Sunrise. The amount of total assets and revenue included in our consolidated financial statements as of and for the year ended December 31, 2020 that is attributable to Sunrise was $9.6 billion and $314.0 million, respectively.

**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, 2020, 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, 2020, 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, 2020 and 2019, the related consolidated statements of operations, comprehensive earnings (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2020, and the related notes and financial statement schedules I and II (collectively, the consolidated financial statements), and our report dated February 16, 2021 expressed an unqualified opinion on those consolidated financial statements.

The Company acquired Sunrise Communications Group AG (Sunrise) during 2020, and management excluded from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2020, Sunrise's internal control over financial reporting associated with total assets of $9.6 billion and total revenues of $314.0 million included in the consolidated financial statements of the Company as of and for the year ended December 31, 2020. Our audit of internal control over financial reporting of the Company also excluded an evaluation of the internal control over financial reporting of Sunrise.

*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 16, 2021

## 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, 2020 and 2019, the related consolidated statements of operations, comprehensive earnings (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2020, and the related notes and financial statement schedules I and 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, 2020 and 2019, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2020, 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, 2020, 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 16, 2021 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

*Change in Accounting Principle*

As discussed in Note 2, the Company changed its method of accounting for leases as of January 1, 2019 due to the adoption of Accounting Standards Update No. 2016-02, *Leases.*

*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 internal and external labor and overhead costs for construction and installation activities*

As discussed in Notes 3 and 10 to the consolidated financial statements, the Company capitalizes certain internal and external labor and overhead costs. Capitalized internal and external labor and overhead costs are recorded within property and equipment, including property and equipment classified as assets held for sale. Property and equipment, and property and equipment classified as assets held for sale were \$8,054.1 million and \$8,614.0 million, respectively as of December 31, 2020.

We identified the assessment of the capitalization of internal and external labor and overhead costs for construction and installation activities as a critical audit matter. Assessing the Company's determination of which costs qualify for capitalization or expense in the period involved subjective auditor judgment.

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 internal and external labor and overhead costs for construction and installation activities. This included comparing the internal and external labor and overhead costs capitalized in the current year for construction and installation activities to the historical internal and external labor and overhead 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 critical audit matter. This included controls related to (1) the Company's identification of qualifying capital internal and external labor and overhead costs and (2) the Company's review of the nature of the underlying activity. We selected a sample of capitalized internal and external labor and overhead costs and assessed the capitalization by investigating the nature of the costs based on underlying internal and third-party documentation. We interviewed operational personnel at the Company to assess the relevance and reliability of the internal documentation provided to support the determination of capitalization versus expense treatment for construction and installation activities.

*Preliminary fair value measurement of the customer relationship intangible asset and property and equipment acquired in the Sunrise acquisition*

As discussed in Note 5 to the consolidated financial statements, Liberty Global plc (the "Company") acquired Sunrise Communications AG (Sunrise) on November 11, 2020 for total consideration of \$5,427.8 million. Based on the preliminary estimated allocation of the purchase price, the acquisition resulted in the recognition of \$2,485.8 million of intangible assets subject to amortization, including a customer relationship intangible, and \$1,494.2 million of property and equipment. The purchase price allocated to the assets acquired and liabilities assumed, including the residual amount allocated to goodwill, is based on preliminary information, which is subject to change as additional information is obtained by the Company. The preliminary information that was available to allocate consideration to the assets acquired and liabilities assumed was affected by the proximity of the acquisition date to the Company's fiscal year-end date of December 31, 2020. During the measurement period, the Company will adjust the preliminary estimated values allocated to the assets acquired and liabilities assumed as additional information is obtained about the facts and circumstances that existed as of the acquisition date.

We identified the assessment of the preliminary fair value measurement of the customer relationship intangible asset and property and equipment acquired in the Sunrise acquisition as a critical audit matter. Testing the projected revenue growth rates, the estimated customer attrition rate, the discount rate, and the methodologies used to estimate the fair value of property and equipment required a higher degree of auditor judgment due to the nature of the assumptions and the proximity of the acquisition to the end of the year. Additionally, addressing the matter involved specialized skill and knowledge.

The following are the primary procedures we performed to address this critical audit matter. We evaluated the design and tested the operating effectiveness of certain internal controls over the Company's preliminary fair value measurement process related to the acquisition, including controls related to the development of the above assumptions. Due to the proximity of the acquisition to the end of the year we applied auditor judgment to determine the nature of procedures to be performed for the above assumptions. This included performing sensitivity analyses to assess the impact of possible changes to certain assumptions on the preliminary fair value measurement of the customer relationship intangible asset. We evaluated the revenue growth rates used by the Company to determine projected revenue by comparing them to historical average growth rates of Sunrise, and publicly available industry data. We assessed the customer attrition rate based on historical data of Sunrise and by comparing it to the historical attrition rate of Sunrise. We involved valuation professionals with specialized skills and knowledge, who assisted in:

– Evaluating the methodologies employed to estimate the fair value of the customer relationship intangible asset and property and equipment based on information available as of December 31, 2020;
– Evaluating the discount rate by comparing it to an independently developed range using publicly available market data for comparable entities; and
– Developing an estimated range of fair values of the customer relationship acquired using the Company's cash flow assumptions and an independently developed range of discount rates, and comparing it to the Company's fair value estimate.

**/s/ KPMG LLP**

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

Denver, Colorado
February 16, 2021

## LIBERTY GLOBAL PLC

## CONSOLIDATED BALANCE SHEETS

| | December 31, 2020 | December 31, 2019 |
|---|---|---|
| | in millions | |
| **ASSETS** | | |
| Current assets: | | |
| Cash and cash equivalents | $ 1,327.2 | $ 8,142.4 |
| Trade receivables, net | 1,090.7 | 1,404.8 |
| Short-term investments (measured at fair value on a recurring basis) (note 7) | 1,600.2 | — |
| Other current assets (notes 4, 6, 7 and 8) | 831.0 | 1,026.1 |
| Total current assets | 4,849.1 | 10,573.3 |
| Investments and related notes receivable (including $3,466.0 million and $1,289.2 million, respectively, measured at fair value on a recurring basis) (note 7) | 5,354.5 | 4,782.0 |
| Property and equipment, net (notes 10 and 12) | 8,054.1 | 13,843.4 |
| Goodwill (note 10 ) | 10,466.7 | 14,052.1 |
| Intangible assets subject to amortization, net (note 10) | 2,886.0 | 572.1 |
| Deferred tax assets (note 13) | 565.1 | 2,457.4 |
| Assets held for sale (note 6) | 24,282.7 | — |
| Other assets, net (notes 4, 6, 8, 10 and 12) | 2,634.5 | 2,766.0 |
| Total assets | $ 59,092.7 | $ 49,046.3 |

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

## CONSOLIDATED BALANCE SHEETS — (Continued)

| | December 31, 2020 | December 31, 2019 |
|---|---|---|
| | in millions | |
| **LIABILITIES AND EQUITY** | | |
| Current liabilities: | | |
| Accounts payable | $ 618.2 | $ 963.9 |
| Deferred revenue (note 4) | 430.9 | 834.9 |
| Current portion of debt and finance lease obligations (notes 11 and 12) | 1,130.4 | 3,877.2 |
| Accrued income taxes | 253.6 | 307.0 |
| Derivative instruments (note 8) | 252.7 | 390.4 |
| Other accrued and current liabilities (notes 12 and 16) | 1,781.2 | 2,278.3 |
| Total current liabilities | 4,467.0 | 8,651.7 |
| Long-term debt and finance lease obligations (notes 11 and 12) | 13,867.3 | 24,305.3 |
| Liabilities associated with assets held for sale (note 6) | 23,197.2 | — |
| Other long-term liabilities (notes 4, 8, 12, 13, 16 and 17) | 4,262.8 | 2,890.7 |
| Total liabilities | 45,794.3 | 35,847.7 |
| Commitments and contingencies (notes 8, 11, 13, 17 and 19) | | |
| Equity (note 14): | | |
| Liberty Global shareholders: | | |
| Class A ordinary shares, $0.01 nominal value. Issued and outstanding 181,348,114 and 181,560,735 shares, respectively | 1.8 | 1.8 |
| Class B ordinary shares, $0.01 nominal value. Issued and outstanding 12,561,444 and 12,151,526 shares, respectively | 0.1 | 0.1 |
| Class C ordinary shares, $0.01 nominal value. Issued and outstanding 386,588,921 and 438,867,447 shares, respectively | 3.9 | 4.4 |
| Additional paid-in capital | 5,271.7 | 6,136.9 |
| Accumulated earnings | 4,692.1 | 6,350.4 |
| Accumulated other comprehensive earnings, net of taxes | 3,693.1 | 1,112.7 |
| Treasury shares, at cost | (0.1) | (0.1) |
| Total Liberty Global shareholders | 13,662.6 | 13,606.2 |
| Noncontrolling interests | (364.2) | (407.6) |
| Total equity | 13,298.4 | 13,198.6 |
| Total liabilities and equity | $ 59,092.7 | $ 49,046.3 |

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

## LIBERTY GLOBAL PLC

## CONSOLIDATED STATEMENTS OF OPERATIONS

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | in millions, except share and per share amounts | | |
| Revenue (notes 4, 6, 7 and 20) | $ 11,980.1 | $ 11,541.5 | $ 11,957.9 |
| Operating costs and expenses (exclusive of depreciation and amortization, shown separately below): | | | |
| Programming and other direct costs of services | 3,437.0 | 3,238.7 | 3,246.1 |
| Other operating (note 15) | 1,777.2 | 1,641.3 | 1,717.2 |
| Selling, general and administrative (**SG&A**) (note 15) | 2,218.3 | 2,107.8 | 2,049.1 |
| Depreciation and amortization (note 10) | 2,331.3 | 3,652.2 | 3,858.2 |
| Impairment, restructuring and other operating items, net (notes 5, 16 and 17) | 98.6 | 156.0 | 248.2 |
| | 9,862.4 | 10,796.0 | 11,118.8 |
| Operating income | 2,117.7 | 745.5 | 839.1 |
| Non-operating income (expense): | | | |
| Interest expense | (1,188.5) | (1,385.9) | (1,478.7) |
| Realized and unrealized gains (losses) on derivative instruments, net (note 8) | (879.3) | (192.0) | 1,125.8 |
| Foreign currency transaction gains (losses), net | (1,416.3) | (94.8) | 90.4 |
| Realized and unrealized gains (losses) due to changes in fair values of certain investments and debt, net (notes 7, 9 and 11) | 45.2 | 72.0 | (384.5) |
| Losses on debt extinguishment, net (note 11) | (233.2) | (216.7) | (65.0) |
| Share of results of affiliates, net (note 7) | (245.3) | (198.5) | (8.7) |
| Other income, net | 76.1 | 114.4 | 43.4 |
| | (3,841.3) | (1,901.5) | (677.3) |
| Earnings (loss) from continuing operations before income taxes | (1,723.6) | (1,156.0) | 161.8 |
| Income tax benefit (expense) (note 13) | 256.9 | (253.0) | (1,573.3) |
| Loss from continuing operations | (1,466.7) | (1,409.0) | (1,411.5) |
| Discontinued operations (note 6): | | | |
| Earnings from discontinued operations, net of taxes | — | 730.3 | 1,163.4 |
| Gain on disposal of discontinued operations, net of taxes | — | 12,316.9 | 1,098.1 |
| | — | 13,047.2 | 2,261.5 |
| Net earnings (loss) | (1,466.7) | 11,638.2 | 850.0 |
| Net earnings attributable to noncontrolling interests | (161.3) | (116.8) | (124.7) |
| Net earnings (loss) attributable to Liberty Global shareholders | $ (1,628.0) | $ 11,521.4 | $ 725.3 |
| Basic and diluted loss from continuing operations attributable to Liberty Global shareholders per share (note 3) | $ (2.70) | $ (2.16) | $ (1.97) |
| Weighted average shares outstanding - basic and diluted | 602,083,910 | 705,794,546 | 778,675,957 |

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

## LIBERTY GLOBAL PLC

## CONSOLIDATED STATEMENTS OF COMPREHENSIVE EARNINGS (LOSS)

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Net earnings (loss) | $ (1,466.7) | $ 11,638.2 | $ 850.0 |
| Other comprehensive earnings (loss), net of taxes (note 18): | | | |
| Continuing operations: | | | |
| Foreign currency translation adjustments | 2,599.7 | 435.5 | (897.9) |
| Pension-related adjustments and other | (18.7) | (14.4) | (20.0) |
| Other comprehensive earnings (loss) from continuing operations | 2,581.0 | 421.1 | (917.9) |
| Other comprehensive earnings (loss) from discontinued operations (note 6) | — | 61.0 | (106.1) |
| Other comprehensive earnings (loss) | 2,581.0 | 482.1 | (1,024.0) |
| Comprehensive earnings (loss) | 1,114.3 | 12,120.3 | (174.0) |
| Comprehensive earnings attributable to noncontrolling interests | (161.9) | (118.0) | (124.9) |
| Comprehensive earnings (loss) attributable to Liberty Global shareholders | $ 952.4 | $ 12,002.3 | $ (298.9) |

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

## LIBERTY GLOBAL PLC

## CONSOLIDATED STATEMENTS OF EQUITY

| | Liberty Global shareholders | | | | | | | | Non-controlling interests | Total equity |
|---|---|---|---|---|---|---|---|---|---|---|
| | Ordinary shares | | | Additional paid-in capital | Accumulated deficit | Accumulated other comprehensive earnings, net of taxes | Treasury shares, at cost | Total Liberty Global shareholders | | |
| | Class A | Class B | Class C | | | | | | | |
| | in millions | | | | | | | | | |
| Balance at January 1, 2018 | $ 2.2 | $ 0.1 | $ 5.8 | $ 11,358.6 | $ (5,897.5) | $ 1,656.0 | $ (0.1) | $ 7,125.1 | $ (407.6) | $ 6,717.5 |
| Net earnings | — | — | — | — | 725.3 | — | — | 725.3 | 124.7 | 850.0 |
| Other comprehensive loss, net of taxes (note 18) | — | — | — | — | — | (1,024.2) | — | (1,024.2) | 0.2 | (1,024.0) |
| Repurchases and cancellations of Liberty Global ordinary shares (note 14) | (0.2) | — | (0.5) | (2,009.3) | — | — | — | (2,010.0) | — | (2,010.0) |
| Distributions by subsidiaries to noncontrolling interest owners (note 14) | — | — | — | — | — | — | — | — | (298.4) | (298.4) |
| Repurchases by Telenet of its outstanding shares | — | — | — | (294.0) | — | — | — | (294.0) | 35.4 | (258.6) |
| Share-based compensation (note 15) | — | — | — | 154.4 | — | — | — | 154.4 | — | 154.4 |
| Adjustments due to changes in subsidiaries' equity and other, net | — | — | — | 4.8 | — | — | — | 4.8 | 12.6 | 17.4 |
| Balance at December 31, 2018 | $ 2.0 | $ 0.1 | $ 5.3 | $ 9,214.5 | $ (5,172.2) | $ 631.8 | $ (0.1) | $ 4,681.4 | $ (533.1) | $ 4,148.3 |

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

## CONSOLIDATED STATEMENTS OF EQUITY — (Continued)

| | 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, before effect of accounting change | $ 2.0 | $ 0.1 | $ 5.3 | $ 9,214.5 | $ (5,172.2) | $ 631.8 | $ (0.1) | $ 4,681.4 | $ (533.1) | $ 4,148.3 |
| Impact of ASU No. 2016-02, *Leases* | — | — | — | — | 1.2 | — | — | 1.2 | — | 1.2 |
| Balance at January 1, 2019, as adjusted for accounting change | 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 18) | — | — | — | — | — | 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.

**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 18) | — | — | — | — | — | 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 CASH FLOWS

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Cash flows from operating activities: | | | |
| Net earnings (loss) | $ (1,466.7) | $ 11,638.2 | $ 850.0 |
| Earnings from discontinued operations | — | 13,047.2 | 2,261.5 |
| Loss from continuing operations | (1,466.7) | (1,409.0) | (1,411.5) |
| Adjustments to reconcile loss from continuing operations to net cash provided by operating activities from continuing operations: | | | |
| Share-based compensation expense | 348.0 | 305.8 | 206.0 |
| Depreciation and amortization | 2,331.3 | 3,652.2 | 3,858.2 |
| Impairment, restructuring and other operating items, net | 98.6 | 156.0 | 248.2 |
| Amortization of deferred financing costs and non-cash interest | 44.8 | 53.7 | 56.4 |
| Realized and unrealized losses (gains) on derivative instruments, net | 879.3 | 192.0 | (1,125.8) |
| Foreign currency transaction losses (gains), net | 1,416.3 | 94.8 | (90.4) |
| Realized and unrealized losses (gains) due to changes in fair values of certain investments and debt, net | (45.2) | (72.0) | 384.5 |
| Losses on debt extinguishment, net | 233.2 | 216.7 | 65.0 |
| Share of results of affiliates, net | 245.3 | 198.5 | 8.7 |
| Deferred income tax expense (benefit) | (261.7) | 65.5 | 438.1 |
| Changes in operating assets and liabilities, net of the effects of acquisitions and dispositions: | | | |
| Receivables and other operating assets | 938.0 | 876.9 | 635.4 |
| Payables and accruals | (841.5) | (787.2) | 459.4 |
| Dividends from affiliates and others | 266.1 | 170.2 | 252.8 |
| Net cash provided by operating activities of continuing operations | 4,185.8 | 3,714.1 | 3,985.0 |
| Net cash provided by operating activities of discontinued operations | — | 871.3 | 1,978.1 |
| Net cash provided by operating activities | 4,185.8 | 4,585.4 | 5,963.1 |
| Cash flows from investing activities: | | | |
| Cash paid for investments | (8,363.2) | (256.1) | (88.8) |
| Cash received from sale of investments | 6,031.9 | 39.6 | 36.2 |
| Cash paid in connection with acquisitions, net of cash acquired | (5,267.8) | (23.1) | (82.5) |
| Capital expenditures, net | (1,350.2) | (1,243.1) | (1,453.0) |
| Cash released from (used to fund) the Vodafone Escrow Accounts, net | 104.9 | (295.2) | — |
| Proceeds received upon disposition of discontinued operations, net | — | 11,203.1 | 2,058.2 |
| Other investing activities, net | (29.6) | 115.8 | 131.4 |
| Net cash provided (used) by investing activities of continuing operations | (8,874.0) | 9,541.0 | 601.5 |
| Net cash used by investing activities of discontinued operations | — | (266.4) | (514.2) |
| Net cash provided (used) by investing activities | $ (8,874.0) | $ 9,274.6 | $ 87.3 |

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, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Cash flows from financing activities: | | | |
| Borrowings of debt | $ 15,975.9 | $ 6,618.8 | $ 4,396.5 |
| Repayments and repurchases of debt and finance lease obligations | (13,450.1) | (10,300.7) | (8,170.6) |
| Repurchases of Liberty Global ordinary shares | (1,072.3) | (3,219.4) | (2,009.9) |
| Payment of financing costs and debt premiums | (290.0) | (206.8) | (73.1) |
| Distributions by subsidiaries to noncontrolling interest owners | (137.1) | (32.6) | (290.3) |
| Net cash received related to derivative instruments | 129.1 | 331.5 | 112.8 |
| Repurchases by Telenet of its outstanding shares | (38.1) | (114.1) | (244.7) |
| Other financing activities, net | (33.8) | 1.0 | (7.3) |
| Net cash provided (used) by financing activities of continuing operations | 1,083.6 | (6,922.3) | (6,286.6) |
| Net cash provided (used) by financing activities of discontinued operations | — | (254.3) | 96.8 |
| Net cash provided (used) by financing activities | 1,083.6 | (7,176.6) | (6,189.8) |
| Effect of exchange rate changes on cash and cash equivalents and restricted cash: | | | |
| Continuing operations | 141.0 | 0.4 | (43.2) |
| Discontinued operations | — | (1.2) | (1.9) |
| Total | 141.0 | (0.8) | (45.1) |
| Net increase (decrease) in cash and cash equivalents and restricted cash: | | | |
| Continuing operations | (3,463.6) | 6,333.2 | (1,743.3) |
| Discontinued operations | — | 349.4 | 1,558.8 |
| Total | $ (3,463.6) | $ 6,682.6 | $ (184.5) |
| Cash and cash equivalents and restricted cash: | | | |
| Beginning of year | $ 8,180.9 | $ 1,498.3 | $ 1,682.8 |
| Net increase (decrease) | (3,463.6) | 6,682.6 | (184.5) |
| End of year | $ 4,717.3 | $ 8,180.9 | $ 1,498.3 |
| Cash paid for interest: | | | |
| Continuing operations | $ 1,127.7 | $ 1,422.7 | $ 1,405.7 |
| Discontinued operations | — | 361.5 | 436.4 |
| Total | $ 1,127.7 | $ 1,784.2 | $ 1,842.1 |
| Net cash paid for taxes: | | | |
| Continuing operations | $ 247.7 | $ 358.2 | $ 309.0 |
| Discontinued operations | — | 135.9 | 55.1 |
| Total | $ 247.7 | $ 494.1 | $ 364.1 |
| Details of end of period cash and cash equivalents and restricted cash: | | | |
| Cash and cash equivalents | $ 1,327.2 | $ 8,142.4 | $ 1,480.5 |
| Restricted cash included in assets held for sale | 3,383.3 | — | — |
| Restricted cash included in other current assets and other assets, net | 6.8 | 38.5 | 15.9 |
| Restricted cash included in current and long-term assets of discontinued operations | — | — | 1.9 |
| Total cash and cash equivalents and restricted cash | $ 4,717.3 | $ 8,180.9 | $ 1,498.3 |

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

## (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.

We provide residential and business-to-business (**B2B**) communications services in (i) the United Kingdom (**U.K.**) and Ireland through Virgin Media Inc. (**Virgin Media**), a wholly-owned subsidiary, (ii) Belgium through Telenet Group Holding N.V. (**Telenet**), a 60.7%-owned subsidiary, and (iii) Switzerland, Poland and Slovakia through various wholly-owned subsidiaries that we collectively refer to as "**UPC Holding**." In addition, we own a 50% noncontrolling interest in a 50:50 joint venture between Vodafone Group plc (**Vodafone**) and Liberty Global (the **VodafoneZiggo JV**), which provides residential and B2B communication services in the Netherlands.

These consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States (**GAAP**).

Effective May 7, 2020, in connection with the pending formation of the U.K. JV (as defined in note 6), we began accounting for the U.K. JV Entities (as defined in note 6) as held for sale. Accordingly, the assets and liabilities of the U.K. JV Entities are included in assets held for sale and liabilities associated with assets held for sale, respectively, on our December 31, 2020 consolidated balance sheet. Consistent with the applicable guidance, we have not reflected similar reclassifications in our consolidated statements of operations or cash flows. 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 B.V. In addition, (a) 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 B.V. that we refer to as "**UPC DTH**" and (b) through July 31, 2018, we provided residential and B2B communication services in Austria. In these consolidated financial statements, our operations in Austria, 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.

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, 2020.

## (2) Accounting Changes and Recent Accounting Pronouncements

### *Accounting Changes*

*ASU 2018-15*

In August 2018, the Financial Accounting Standards Board (**FASB**) issued Accounting Standards Update (**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 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 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.

*ASU 2016-02*

In February 2016, the FASB issued ASU No. 2016-02, *Leases* (**ASU 2016-02**), which, for most leases, results in lessees recognizing right-of-use (**ROU**) assets and lease liabilities on the balance sheet. ASU 2016-02, as amended by ASU No. 2018-11, *Targeted Improvements*, requires lessees and lessors to recognize and measure leases at the beginning of the earliest period presented using one of two modified retrospective approaches. A number of optional practical expedients may be applied in transition. We adopted ASU 2016-02 on January 1, 2019.

The main impact of the adoption of ASU 2016-02 relates to the recognition of ROU assets and lease liabilities on our consolidated balance sheet for those leases classified as operating leases under previous GAAP. In transition, we have applied the practical expedients that permit us not to reassess (i) whether expired or existing contracts contain a lease under the new standard, (ii) the lease classification for expired or existing leases or (iii) whether previously-capitalized initial direct costs would qualify for capitalization under the new standard. In addition, we have not used hindsight during transition.

We have implemented a new lease accounting system and related internal controls over financial reporting to meet the requirements of ASU 2016-02.

For additional information regarding our leases, see note 12.

***Recent Accounting Pronouncements***

*ASU 2019-12*

In December 2019, the FASB issued 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. ASU 2019-12 is effective for annual reporting periods beginning after December 15, 2020, including interim periods within those fiscal years, with early adoption permitted. We do not expect the adoption of ASU 2019-12 to have a significant impact on our consolidated financial statements.

## (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 uncollectible 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 5, 6, 8, 10, 11 and 12.

***Trade Receivables***

Our trade receivables are reported net of an allowance for doubtful accounts. Such allowance aggregated $49.8 million and $42.8 million at December 31, 2020 and 2019, 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.

***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 statements of operations. Under the equity method of accounting, investments are recorded at cost and are subsequently increased or reduced to reflect our share of income 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 of 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 investments to determine whether a decline in fair value below the cost basis is 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, accrued liabilities 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. If the derivative instrument is not designated as a hedge, changes in the fair value of the derivative instrument are recognized in earnings. If the derivative instrument is designated as a cash flow hedge, the effective portions of changes in the fair value of the derivative instrument are recorded in other comprehensive earnings or loss and subsequently reclassified into our consolidated statements of operations when the hedged forecasted transaction affects earnings. Ineffective portions of changes in the fair value of cash flow hedges are recognized in earnings. We generally do not apply hedge accounting to our derivative instruments.

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 derivative contracts that are terminated prior to maturity, the cash paid or received upon termination that relates to future periods is classified as a financing activity in our consolidated statement of cash flows.

For 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 cable and mobile transmission and distribution facilities and the installation of new cable 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 cable system to a customer location, (ii) the replacement of a drop and (iii) the installation of equipment for additional services, such as digital cable, telephone or broadband internet service. 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 cable 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, 2020 and 2019, the recorded value of our asset retirement obligations was $82.2 million and $55.5 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 and reviewed for impairment.

For additional information regarding the useful lives of our intangible assets, see note 10.

***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) 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 in the period that includes the enactment date. 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. 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 — Cable Networks.* We recognize revenue from the provision of broadband internet, video and fixed-line telephony services over our cable 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 cable 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.

*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.

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 20.

***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 are 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.

***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 loss from continuing operations attributable to Liberty Global shareholders are set forth below:

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Loss from continuing operations | $ (1,466.7) | $ (1,409.0) | $ (1,411.5) |
| Net earnings from continuing operations attributable to noncontrolling interests | (161.3) | (116.8) | (120.5) |
| Net loss from continuing operations attributable to Liberty Global shareholders | $ (1,628.0) | $ (1,525.8) | $ (1,532.0) |

We reported losses from continuing operations attributable to Liberty Global shareholders during 2020, 2019 and 2018. Therefore, the potentially dilutive effect at December 31, 2020, 2019 and 2018 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, 62.5 million and 58.7 million, respectively, and (ii) the aggregate number of shares issuable pursuant to PSARs and PSUs of 18.4 million, 23.9 million and 9.2 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 $44.3 million and $30.6 million as of December 31, 2020 and 2019, 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 $442.6 million and $867.1 million as of December 31, 2020 and 2019, respectively. The decrease in deferred revenue during 2020 is primarily due to the net effect of (a) the recognition of $795.3 million of revenue that was included in our deferred revenue balance at December 31, 2019, (b) $475.3 million of deferred revenue related to the U.K. JV Entities that was reclassified to liabilities associated with assets held for sale and (c) advanced billings in certain markets. The long-term portions of our deferred revenue balances are included within other long-term liabilities on our consolidated balance sheets.

***Contract Costs***

Our aggregate assets associated with incremental costs to obtain and fulfill our contracts were $46.6 million and $92.6 million at December 31, 2020 and 2019, 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 2020, 2019 and 2018, we amortized $134.8 million, $101.1 million and $99.8 million, respectively, to operating costs and expenses associated with our assets related to contract costs (including with respect to the U.K. JV Entities (as defined in note 6), which assets are presented as held for sale).

***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, Liberty Global completed the acquisition of Sunrise Communications Group AG (**Sunrise**) (the **Sunrise Acquisition**). The Sunrise Acquisition was effected through an all cash public tender offer (the **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). As of December 31, 2020, Liberty Global holds 98.9% of the share capital of Sunrise and has initiated a statutory "squeeze-out" procedure according to applicable Swiss law pursuant to which we will acquire the remaining 1.1% of Sunrise Shares that we do not yet own. This "squeeze-out" procedure is expected to be completed during the first half of 2021. As of December 31, 2020, we have recorded a liability of $59.8 million associated with the Sunrise Shares we have not yet acquired.

The Offer was funded through (i) borrowings of CHF 3.2 billion ($3.5 billion at the applicable date) under new term loan facilities and (ii) existing liquidity of Liberty Global. In addition, we used amounts under these term loan facilities to (a) refinance CHF 1.4 billion ($1.5 billion at the applicable date) principal amount of Sunrise's existing debt and (b) redeem in full CHF 200.0 million ($219.3 million at the applicable date) outstanding principal amount of Sunrise's senior secured notes. For additional information regarding financing arrangements entered into by UPC Holding in connection with the Sunrise Acquisition, see note 11.

We have accounted for the Sunrise Acquisition using the acquisition method of accounting, whereby the total purchase price (including with respect to the aforementioned squeeze-out procedure) 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 preliminary purchase price and the opening balance sheet of Sunrise at the November 11, 2020 acquisition date is presented in the following table. The preliminary opening balance sheet is subject to adjustment based on our final assessment of the fair values of the acquired identifiable assets and liabilities. Although most items in the valuation process remain open, the items with the highest likelihood of changing upon finalization of the valuation process include (i) property and equipment, (ii) goodwill, (iii) intangible assets associated with customer relationships, mobile spectrum assets and trade names and (iv) income taxes (in millions):

| | |
|---|---|
| Cash and cash equivalents | $ 108.5 |
| Trade receivables, net | 489.2 |
| Other current assets | 163.5 |
| Property and equipment, net | 1,494.2 |
| Goodwill (a) | 3,465.7 |
| 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 | (535.9) |
| Long-term debt and finance lease obligations | (1,762.5) |
| Long-term operating lease liabilities | (877.6) |
| Other long-term liabilities | (612.8) |
| 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.

(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 owned a 50.0% 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 50.0% 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 50.0% 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 or 2018. 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 |
| | in millions, except per share amounts | |
| Revenue | $ 13,698.2 | $ 13,453.2 |
| Net loss from continuing operations attributable to Liberty Global shareholders | $ (1,879.3) | $ (1,889.8) |
| Basic and diluted loss from continuing operations attributable to Liberty Global shareholders per share | $ (3.12) | $ (2.68) |

Our consolidated statement of operations for 2020 includes revenue and net earnings of $314.0 million and $11.9 million, respectively, attributable to Sunrise.

## (6) Dispositions

***Pending Joint Venture Transaction***

On May 7, 2020, we entered into a Contribution Agreement (the **Contribution Agreement**) with, among others, Telefonica SA (**Telefónica**). Pursuant to the Contribution Agreement, Liberty Global and Telefónica agreed to form a 50:50 joint venture (the **U.K. JV**), which will combine Virgin Media's operations in the U.K. along with certain other Liberty Global subsidiaries created as a result of the pending U.K. JV (together, the **U.K. JV Entities**) with Telefónica's mobile business in the U.K. to create a nationwide integrated communications provider. In our segment presentation, the U.K. JV Entities are included in our U.K./Ireland segment.

In connection with the transaction, we have completed certain recapitalization financings, as described in note 11. The outstanding third-party debt associated with the U.K. JV Entities will be contributed in full to the U.K. JV, and Telefónica's business in the U.K. will be contributed on a debt-free basis. The transaction will not trigger a change of control under Virgin Media's debt agreements.

Effectively all of Liberty Global's U.K. tax capital allowances and tax loss carryforwards, which primarily resulted from prior infrastructure investments, reside in the U.K. JV Entities and, therefore, will be available for use solely within the U.K. JV upon the closing of the transaction.

At closing, we expect to pay Telefónica an equalization payment estimated to be approximately £2.5 billion ($3.4 billion), as adjusted for debt and debt-like items and certain working capital and other adjustments. After taking into account the recapitalizations and the equalization payment, Liberty Global is expected to receive an estimated £1.4 billion ($1.9 billion) in total, including approximately £800 million ($1.1 billion) from the recapitalization of Virgin Media's retained and 100.0% owned Ireland business.

Pursuant to the framework agreement that we expect to enter into in connection with the closing of the U.K. JV, our company and Telefónica will provide certain services to the U.K. JV. The annual charges to the U.K. JV will ultimately depend on the actual level of services required by the U.K. JV.

The U.K. JV intends to distribute available cash to the shareholders periodically and is expected to undertake periodic further recapitalizations, subject to market and operating conditions, to maintain a target net leverage ratio ranging between 4.0 and 5.0 times EBITDA (as defined in the applicable shareholders' agreement). Our company will retain the cash generated by the operations of the U.K. JV Entities through the closing date and is required to fund any deficit in the associated defined pension plans that arises from the next triennial actuarial valuation.

The consummation of the transaction contemplated by the Contribution Agreement is subject to certain conditions, including competition clearance by the applicable regulatory authorities. The Contribution Agreement also includes customary termination rights, including a right of the parties to terminate the agreement if the transaction has not closed within 24 months following the date of the Contribution Agreement, which may be extended by six months under certain circumstances. We currently expect the U.K. JV transaction to close in mid-2021. Following completion of the transaction, we expect to account for our 50% interest in the U.K. JV as an equity method investment.

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. We have not presented the U.K. JV Entities as a discontinued operation as this transaction does not represent a strategic shift that will have a major effect on our financial results or operations. The carrying amounts of the major classes of assets and liabilities that are classified as held for sale at December 31, 2020 are summarized below (in millions):

| | |
|---|---|
| Assets: | |
| Current assets (a) | $ 4,519.8 |
| Property and equipment, net | 8,614.0 |
| Goodwill | 7,918.5 |
| Other assets, net | 3,230.4 |
| Total assets | $ 24,282.7 |
| 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 | $ 23,197.2 |

(a) Amount includes restricted cash, but excludes cash and cash equivalents, as the cash and cash equivalents of the U.K. JV Entities will be retained by Liberty Global upon the formation of the U.K. JV and are therefore not classified as held for sale.

***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 in "other current assets" and "other assets, net", respectively, on our consolidated balance sheets. The aggregate balance of the Vodafone Escrow Accounts was $190.4 million and $295.2 million at December 31, 2020 and 2019, respectively.

In connection with the sale of the Vodafone Disposal Group, we recognized a gain of $12.2 billion that 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 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. During 2020 and 2019, we recorded revenue of $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 19.

*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 that 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 have agreed to provide certain transitional services to M7 for a period of up to two years. These services principally comprise network and information technology-related functions. During 2020 and 2019, we recorded revenue of $1.9 million and $1.4 million, respectively, associated with these transitional services.

*UPC Austria*

On July 31, 2018, we completed the sale of our Austrian operations, "**UPC Austria**," to Deutsche Telekom AG (**Deutsche Telekom**). After considering debt, working capital and noncontrolling interest adjustments and $35.5 million (equivalent at the transaction date) of cash paid by our company to settle centrally-held vendor financing obligations associated with UPC Austria, we received net cash proceeds of $2,058.2 million (equivalent at the applicable rates). A portion of the net proceeds were used to repay or redeem an aggregate $1.5 billion (equivalent at the applicable dates) principal amount of our outstanding debt, including (i) the repayment of $913.4 million (equivalent at the repayment date) principal amount under the UPC Holding Bank Facility, (ii) the redemption of $69.6 million (equivalent at the redemption date) principal amount of the UPCB SPE Notes and (iii) the redemption of $515.5 million (equivalent at the redemption date) principal amount of the VM Notes. The remaining net proceeds from the sale of UPC Austria were made available for general corporate purposes, including an additional $500.0 million of share repurchases.

In connection with the sale of UPC Austria, we recognized a gain of $1,098.1 million that includes cumulative foreign currency translation gains of $79.5 million. No income taxes were required to be provided on this gain, which is included in gain on disposal of discontinued operations, net of taxes, in our consolidated statement of operations.

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. During 2020, 2019 and 2018, we recorded revenue of $35.0 million, $42.8 million and $17.9 million, respectively, associated with these transitional services.

In October of 2019, we received notification of certain claims made by Deutsche Telekom related to our disposal of UPC Austria. For additional information, see note 19.

***Presentation of Discontinued Operations***

The operations of UPC Austria, the Vodafone Disposal Group and UPC DTH are presented as discontinued operations in our consolidated financial statements for 2019 and 2018, as applicable, and are summarized in the following tables. These amounts exclude intercompany revenue and expenses that are eliminated within our consolidated statements of operations. For information regarding our basic and diluted ordinary shares outstanding, see note 3.

| | Vodafone Disposal Group (a) | UPC DTH (b) | Total |
|---|---|---|---|
| | | in millions | |
| *Year ended December 31, 2019* | | | |
| Revenue | $ 2,017.9 | $ 36.7 | $ 2,054.6 |
| Operating income | $ 1,165.6 | $ 10.7 | $ 1,176.3 |
| Earnings before income taxes | $ 994.7 | $ 9.5 | $ 1,004.2 |
| Income tax expense | (273.9) | — | (273.9) |
| Net earnings attributable to Liberty Global shareholders | $ 720.8 | $ 9.5 | $ 730.3 |
| Basic and diluted earnings from discontinued operations attributable to Liberty Global shareholders per share | | | $ 1.03 |

(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.

| | UPC Austria (a) | Vodafone Disposal Group | UPC DTH | Total |
|---|---|---|---|---|
| | | in millions | | |
| *Year ended December 31, 2018* | | | | |
| Revenue | $ 252.4 | $ 3,584.2 | $ 117.0 | $ 3,953.6 |
| Operating income | $ 139.0 | $ 1,787.0 | $ 11.7 | $ 1,937.7 |
| Earnings before income taxes | $ 138.7 | $ 1,396.3 | $ 9.6 | $ 1,544.6 |
| Income tax benefit (expense) | (23.3) | (365.2) | 7.3 | (381.2) |
| Net earnings | 115.4 | 1,031.1 | 16.9 | 1,163.4 |
| Net earnings attributable to noncontrolling interests | (4.2) | — | — | (4.2) |
| Net earnings attributable to Liberty Global shareholders | $ 111.2 | $ 1,031.1 | $ 16.9 | $ 1,159.2 |
| Basic and diluted earnings from discontinued operations attributable to Liberty Global shareholders per share | | | | $ 1.49 |

(a) Includes the operating results of UPC Austria through July 31, 2018, the date UPC Austria was sold.

## (7) Investments

The details of our investments are set forth below:

| | December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | Ownership (a) |
| **Accounting Method** | in millions | | % |
| Equity (b): | | | |
| Long-term: | | | |
| VodafoneZiggo JV (c) | $ 3,052.3 | $ 3,174.1 | 50.0 |
| All3Media Group (**All3Media**) | 157.7 | 172.8 | 50.0 |
| Formula E Holdings Ltd (**Formula E**) | 105.8 | 105.2 | 32.9 |
| Other | 172.9 | 40.7 | |
| Total — equity | 3,488.7 | 3,492.8 | |
| Fair value: | | | |
| Short-term: | | | |
| Separately-managed accounts (**SMAs**) (d) | 1,600.2 | — | |
| Long-term: | | | |
| ITV plc (**ITV**) — subject to re-use rights (e) | 581.0 | 798.1 | 10.0 |
| SMAs (d) | 365.7 | — | |
| Skillz Inc. (**Skillz**) (f) | 225.4 | 10.2 | 3.0 |
| Univision Holdings Inc. (**Univision**) | 100.0 | — | 11.5 |
| CANAL+ Polska S.A. (**CANAL+ Polska**) - formerly known as ITI Neovision S.A. | 92.3 | 122.4 | 17.0 |
| EdgeConneX Inc. (**EdgeConneX**) (f) | 75.1 | 34.4 | 5.1 |
| Lions Gate Entertainment Corp (**Lionsgate**) (g) | 72.0 | 68.0 | 3.0 |
| Other (h) | 354.3 | 256.1 | |
| Total — fair value | 3,466.0 | 1,289.2 | |
| Total investments (i) | $ 6,954.7 | $ 4,782.0 | |
| Short-term investments | $ 1,600.2 | $ — | |
| Long-term investments | $ 5,354.5 | $ 4,782.0 | |

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(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, 2020 and 2019, the aggregate carrying amounts of our equity method investments exceeded our proportionate share of the respective investee's net assets by $1,198.5 million and $1,041.0 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.

(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 $855.8 million and $786.1 million, respectively (the **VodafoneZiggo JV Receivable I**), and (ii) a euro-denominated note receivable entered into during the third quarter of 2020 with a principal amount of $127.1 million at December 31, 2020 (the **VodafoneZiggo JV**

**Receivable II** and, together with the VodafoneZiggo JV Receivable I, the **VodafoneZiggo JV Receivables**). The VodafoneZiggo JV Receivable I, as amended in June 2020, and the VodafoneZiggo JV Receivable II each bear interest at 5.55% and have a final maturity date of December 31, 2030. In each of 2019 and 2018, we received a €100.0 million principal payment on the VodafoneZiggo JV Receivable I ($112.1 million and $114.5 million at the respective transaction dates). During 2020, interest accrued on the VodafoneZiggo JV Receivables was $48.0 million, all of which was cash settled.

(d) Represents investments held under SMAs, which are maintained by investments 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, 2020, all of our investments held under SMAs were classified as available-for-sale debt securities, as further described in note 3. At December 31, 2020, interest accrued on our debt securities, which is included in other current assets on our consolidated balance sheet, was $7.1 million.

(e) In connection with our investment in ITV, we entered into a share collar (the **ITV Collar**) with respect to the ITV shares held by our company. The aggregate purchase price paid to acquire our investment in ITV was financed through borrowings under a secured borrowing agreement (the **ITV Collar Loan**). We may elect to use cash or the collective value of the related shares and equity-related derivative instrument to settle the ITV Collar Loan**.** During 2020, we cash settled a portion of the ITV Collar Loan and unwound the associated portion of the ITV Collar, as further described in note 8.

(f) At December 31, 2020, the fair values of our investments in Skillz and EdgeConneX reflect the merger of Skillz with Flying Eagle Acquisition Corporation and EdgeConneX with Herndon Merger Sub Inc, each completed during 2020.

(g) In connection with our investment in Lionsgate, we previously entered into (i) the Lionsgate Forward (as defined in note 8) and (ii) a related borrowing agreement (the **Lionsgate Loan**), each of which were fully settled during 2020, as further described in note 8.

(h) As of December 31, 2020, we hold a $9.7 million noncontrolling junior interest in receivables we have securitized.

(i) The purchase and sale of investments are presented on a gross basis in our consolidated statements of cash flows, including those made by investment managers acting as agents on our behalf.

***Equity Method Investments***

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

| | Year ended December 31, | | |
|---|---|---|---|
| | **2020** | **2019** | **2018** |
| | | **in millions** | |
| VodafoneZiggo JV (a) | $ (201.1) | $ (185.9) | $ 11.4 |
| All3Media | (27.9) | (8.8) | (19.2) |
| Formula E | (8.4) | 1.7 | (0.2) |
| Other | (7.9) | (5.5) | (0.7) |
| Total | $ (245.3) | $ (198.5) | $ (8.7) |

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(a) Amounts include the net effect of (i) our 50% share of the results of operations of the VodafoneZiggo JV and (ii) 100% of the interest income earned on the VodafoneZiggo JV Receivables.

*VodafoneZiggo JV*. Each of Liberty Global and Vodafone (each a "**Shareholder**") holds 50% of the issued share capital of the VodafoneZiggo JV. The Shareholders intend for the VodafoneZiggo JV to be funded solely from its net cash flow from operations and third-party financing. We account for our 50% interest in the VodafoneZiggo JV as an equity method investment. We consider the VodafoneZiggo JV to be a related party.

In connection with the formation of the VodafoneZiggo JV, the Shareholders entered into a shareholders agreement (the **Shareholders Agreement**). The Shareholders Agreement contains customary provisions for the governance of a 50:50 joint venture that result in Liberty Global and Vodafone having joint control over decision making with respect to the VodafoneZiggo JV.

The Shareholders Agreement also provides (i) for a dividend policy that requires the VodafoneZiggo JV to distribute all unrestricted cash to the 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 2020, 2019 and 2018, we received dividend distributions from the VodafoneZiggo JV of $249.5 million, $162.7 million and $232.5 million, respectively, which were accounted for as returns on capital for purposes of our consolidated statements of cash flows.

Each Shareholder has the right to initiate an initial public offering (**IPO**) of the VodafoneZiggo JV with the opportunity for the other Shareholder to sell shares in the IPO on a pro rata basis. As of January 1, 2021, each 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 Shareholder.

Pursuant to an agreement (the **Framework Agreement**), Liberty Global provides certain services to the VodafoneZiggo JV (collectively, the **JV Services**). The 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 JV Services provided during the term of the Framework Agreement. During 2020, 2019 and 2018, we recorded revenue from the VodafoneZiggo JV of $178.9 million, $189.1 million and $189.1 million, respectively, primarily related to (a) the JV Services and (b) sales of customer premises equipment at a mark-up. In addition, during 2019 and 2018, we purchased certain assets on the VodafoneZiggo JV's behalf with an aggregate cost of $14.4 million and $13.1 million, respectively. At December 31, 2020 and 2019, $27.4 million and $19.3 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.

The summarized results of operations of the VodafoneZiggo JV are set forth below:

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Revenue | $ 4,565.4 | $ 4,407.8 | $ 4,602.2 |
| Loss before income taxes | $ (287.2) | $ (512.5) | $ (467.8) |
| Net loss | $ (448.7) | $ (470.0) | $ (91.6) |

The summarized financial position of the VodafoneZiggo JV is set forth below:

| | December 31, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Current assets | $ 1,067.2 | $ 918.4 |
| Long-term assets | 22,563.6 | 21,508.1 |
| Total assets | $ 23,630.8 | $ 22,426.5 |
| Current liabilities | $ 2,967.7 | $ 2,726.4 |
| Long-term liabilities | 16,450.8 | 14,920.7 |
| Owners' equity | 4,212.3 | 4,779.4 |
| Total liabilities and owners' equity | $ 23,630.8 | $ 22,426.5 |

***Fair Value Investments***

The following table sets forth the details of our realized and unrealized gains (losses) due to changes in fair values of certain investments, net:

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | in millions | | |
| Skillz | $ 238.0 | $ 1.1 | $ — |
| ITV | (217.1) | 163.9 | (257.8) |
| EdgeConneX | 33.1 | — | — |
| CANAL+ Polska | (26.3) | 2.7 | (24.9) |
| SMAs | 5.2 | — | — |
| Lionsgate | 4.0 | (25.0) | (86.4) |
| Other, net | (1.1) | (43.7) | (24.1) |
| Total | $ 35.8 | $ 99.0 | $ (393.2) |

*Debt Securities*

The following table sets forth the details of our debt securities, which comprise all of our investment held under SMAs, as of and for the year ended December 31, 2020:

| | Amortized cost basis | 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 | $ 1,962.7 | $ 3.2 | $ 1,965.9 |

During 2020, we received proceeds from the sale of debt securities of $6.0 billion, the majority of which were reinvested in new debt securities held under SMAs. The sale of debt securities during 2020 resulted in a net gain of $2.0 million.

The fair values of our debt securities as of December 31, 2020 by contractual maturity are shown below (in millions):

| | |
|---|---|
| Due in one year or less | $ 1,600.2 |
| Due in one to five years | 359.3 |
| Due in five to ten years | 6.4 |
| Total (a) | $ 1,965.9 |

---

(a) The weighted average life our total debt securities was 0.5 years as of December 31, 2020.

## (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, 2020 | | | December 31, 2019 | | |
|---|---|---|---|---|---|---|
| | Current | Long-term | Total | Current | Long-term | Total |
| | in millions | | | | | |
| Assets (a): | | | | | | |
| Cross-currency and interest rate derivative contracts (b) | $ 148.8 | $ 418.4 | $ 567.2 | $ 270.8 | $ 886.4 | $ 1,157.2 |
| Equity-related derivative instruments (c) | 49.3 | 231.6 | 280.9 | 55.2 | 608.2 | 663.4 |
| Foreign currency forward and option contracts | 36.5 | 0.1 | 36.6 | 4.6 | 1.4 | 6.0 |
| Other | — | 0.1 | 0.1 | 0.5 | 0.4 | 0.9 |
| Total | $ 234.6 | $ 650.2 | $ 884.8 | $ 331.1 | $ 1,496.4 | $ 1,827.5 |
| Liabilities (a): | | | | | | |
| Cross-currency and interest rate derivative contracts (b) | $ 171.2 | $ 1,364.1 | $ 1,535.3 | $ 389.2 | $ 1,192.3 | $ 1,581.5 |
| Foreign currency forward and option contracts | 81.5 | — | 81.5 | 1.2 | — | 1.2 |
| Total | $ 252.7 | $ 1,364.1 | $ 1,616.8 | $ 390.4 | $ 1,192.3 | $ 1,582.7 |

---

(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 $336.0 million, $16.6 million and ($71.1 million) during 2020, 2019 and 2018, 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 primarily include the ITV Collar, and as of December 31, 2019, the Lionsgate Forward (as defined and described below). The fair value of the ITV Collar does not include credit risk valuation adjustments as we assume that any losses incurred by our company in the event of nonperformance by the respective counterparty would be, subject to relevant insolvency laws, fully offset against amounts we owe to such counterparty pursuant to the related secured borrowing arrangement.

The details of our realized and unrealized gains (losses) on derivative instruments, net, are as follows:

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Cross-currency and interest rate derivative contracts | $ (1,184.3) | $ (207.3) | $ 905.8 |
| Equity-related derivative instruments: | | | |
| ITV Collar | 364.2 | (84.4) | 176.7 |
| Lionsgate Forward | 0.8 | 13.0 | 30.1 |
| Other | 21.7 | 8.0 | (9.3) |
| Total equity-related derivative instruments | 386.7 | (63.4) | 197.5 |
| Foreign currency forward and option contracts | (81.1) | 77.4 | 22.7 |
| Other | (0.6) | 1.3 | (0.2) |
| Total | $ (879.3) | $ (192.0) | $ 1,125.8 |

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 derivative contracts that are terminated prior to maturity, the cash paid or received upon termination that relates to future periods is classified as a financing activity. The following table sets forth the classification of the net cash inflows of our derivative instruments:

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Operating activities | $ (55.9) | $ 179.0 | $ 244.4 |
| Investing activities | (39.8) | — | — |
| Financing activities | 129.1 | 331.5 | 112.8 |
| Total | $ 33.4 | $ 510.5 | $ 357.2 |

***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, 2020, our exposure to counterparty credit risk included derivative assets with an aggregate fair value of $83.2 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.

**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, 2020, 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, 2020:

| | Notional amount due from counterparty | | Notional amount due to counterparty | | | Weighted average remaining life |
|---|---|---|---|---|---|---|
| | in millions | | | | | in years |
| UPC Holding | $ | 360.0 | € | 267.9 | | 4.8 |
| | $ | 4,200.0 | CHF | 3,838.7 | (a)(b) | 7.0 |
| | € | 3,418.3 | CHF | 3,802.7 | (a)(b) | 4.7 |
| | € | 707.0 | PLN | 2,999.5 | | 3.4 |
| | CHF | 740.0 | € | 701.1 | | 2.0 |
| Telenet | $ | 3,940.0 | € | 3,489.6 | (a) | 6.1 |
| | € | 45.2 | $ | 50.0 | (c) | 4.1 |

(a) Includes certain derivative instruments that are "forward-starting," such that the initial exchange occurs at a date subsequent to December 31, 2020. These instruments are typically entered into in order to extend existing hedges without the need to amend existing contracts.

(b) Includes amounts subject to a 0.0% floor.

(c) 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. At December 31, 2020, the total U.S. dollar equivalent of the notional amount of these derivative instruments was $55.2 million.

***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, 2020:

| | Pays fixed rate | | Receives fixed rate | |
|---|---|---|---|---|
| | Notional amount | Weighted average remaining life | Notional amount | Weighted average remaining life |
| | in millions | in years | in millions | in years |
| UPC Holding | $ 11,053.1 (a) | 3.5 | $ 4,970.4 | 4.9 |
| Telenet | $ 3,526.3 (a) | 4.2 | $ 1,744.7 | 2.7 |
| Other | $ 104.4 | 3.0 | $ — | — |

(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, 2020, 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, 2020:

| | Notional amount due from counterparty | Weighted average remaining life |
|---|---|---|
| | in millions | in years |
| UPC Holding | $ 3,300.0 (a) | 0.6 |
| Telenet | $ 2,295.0 (a) | 1.0 |
| Other | $ 104.4 | (b) |

(a) Includes amounts subject to a 0.0% floor.

(b) Contractual life expired on January 15, 2021.

***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, 2020, 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 $489.0 million and $7,930.2 million, respectively.

***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 to borrowing costs at December 31, 2020 (a) |
|---|---|
| UPC Holding | 0.42 % |
| Telenet | 0.33 % |
| Total increase to borrowing costs | 0.38 % |

_______________

(a) Represents the effect of derivative instruments in effect at December 31, 2020 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. As of December 31, 2020, the total U.S. dollar equivalent of the notional amounts of our foreign currency forward and option contracts was $2.4 billion.

***Equity-related Derivative Instruments***

*ITV Collar and Secured Borrowing.* The ITV Collar comprises (i) purchased put options exercisable by our company and (ii) written call options exercisable by the counterparty. The ITV Collar effectively hedges a portion of the value of our investment in ITV shares from losses due to market price decreases below the put option price while retaining a portion of the gains from market price increases up to the call option price. The ITV Collar has settlement dates ranging through 2022.

The ITV Collar and related borrowing agreement also provide our company with the ability to borrow against the value of its ITV shares. At December 31, 2020, certain of the ITV shares our company holds remain subject to the ITV Collar, which are held in a custody account and are pledged under the ITV Collar Loan. The ITV Collar Loan, which has maturity dates consistent with the ITV Collar and contains no financial covenants, provides for customary representations and warranties, events of default and certain adjustment and termination events. Under the terms of the ITV Collar, the counterparty has the right to re-use the pledged ITV shares held in the custody account, but we have the right to recall the shares that are re-used by the counterparty subject to certain costs. In addition, the counterparty retains dividends on the ITV shares that the counterparty would need to borrow from the custody account to hedge its exposure under the ITV Collar. During 2020, we cash settled a portion of the ITV Collar Loan and unwound the associated portion of the ITV Collar. As of December 31, 2020, the fair value of the ITV Collar was a net asset of $252.6 million and principal borrowings outstanding under the ITV Collar Loan were $415.9 million.

*Lionsgate Forward and Secured Borrowing.* During 2020, we cash settled the remaining tranches of a prepaid forward (the **Lionsgate Forward**) with respect to 833,333 of our voting and 833,334 of our non-voting Lionsgate shares and the related borrowings under the Lionsgate Loan. Accordingly, at December 31, 2020, the Lionsgate Forward and the Lionsgate Loan had been fully settled.

For additional information regarding our investments in ITV and Lionsgate, see note 7.

## (9) Fair Value Measurements

We use the fair value method to account for (i) certain of our investments, (ii) our derivative instruments and (iii) certain instruments that we classify as debt. The reported fair values of these investments and instruments as of December 31, 2020 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 the fourth quarter of 2020, (i) our investment in Skillz transferred from Level 3 to Level 1 in connection with an initial public offering that was completed subsequent to Skillz's merger with Flying Eagle Corporation, (ii) our investment in CANAL+ Polska transferred from Level 3 to Level 2 in connection with an attempted initial public offering and (iii) certain probability weighted, deal contingent cross-currency, interest rate and foreign currency derivative contracts entered into in connection with the Sunrise Acquisition moved from Level 3 to Level 2 upon the completion of the acquisition.

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 (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 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 measurement 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, 2020, 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 (i) various derivative instruments and (ii) certain instruments that we classify as debt, as further described in notes 8 and 11, respectively. The recurring fair value measurements of these instruments are determined using discounted cash flow models. With the exception of the inputs for certain swaptions, 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 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 (other than the valuations of the aforementioned swaptions) fall under Level 2 of the fair value hierarchy. Due to the lack of Level 2 inputs for the swaption valuations, we believe these valuations fall under Level 3 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 and impairment assessments. The nonrecurring valuations associated with acquisition accounting primarily include the valuation of reporting units, customer relationship and other intangible assets and property and equipment. Unless a reporting unit has a readily determinable fair value, the valuation of reporting units is 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, 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. Most of our nonrecurring valuations use significant unobservable inputs and therefore fall under Level 3 of the fair value hierarchy. During 2020, we performed a nonrecurring fair value measurement associated with the Sunrise Acquisition. The weighted average discount rate used in the preliminary valuation of the customer relationships acquired in connection with the Sunrise Acquisition was 6.75%. During 2019, we performed a nonrecurring fair value measurement associated with the De Vijver Media Acquisition. This valuation had no significant impact on our consolidated balance sheet at December 31, 2019. For information regarding our acquisitions, see note 5.

A summary of our assets and liabilities that are measured at fair value on a recurring basis is as follows:

| | | Fair value measurements at December 31, 2020 using: | | |
|---|---|---|---|---|
| **Description** | **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 | — |
| Other | 0.1 | — | 0.1 | — |
| Total derivative instruments | 884.8 | — | 603.9 | 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 | $ 4,350.8 | $ 1,293.9 | $ 2,256.4 | $ 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 | $ — |

| Description | December 31, 2019 | Fair value measurements at December 31, 2019 using: 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 | $ 1,157.2 | $ — | $ 1,157.2 | $ — |
| Equity-related derivative instruments | 663.4 | — | — | 663.4 |
| Foreign currency forward and option contracts | 6.0 | — | 6.0 | — |
| Other | 0.9 | — | 0.9 | — |
| Total derivative instruments | 1,827.5 | — | 1,164.1 | 663.4 |
| Investments | 1,289.2 | 869.2 | — | 420.0 |
| Total assets | $ 3,116.7 | $ 869.2 | $ 1,164.1 | $ 1,083.4 |
| Liabilities: | | | | |
| Derivative instruments: | | | | |
| Cross-currency and interest rate derivative contracts | $ 1,581.5 | $ — | $ 1,561.6 | $ 19.9 |
| Foreign currency forward and option contracts | 1.2 | — | 1.2 | — |
| Total derivative liabilities | 1,582.7 | — | 1,562.8 | 19.9 |
| Debt | 45.6 | — | 45.6 | — |
| Total liabilities | $ 1,628.3 | $ — | $ 1,608.4 | $ 19.9 |

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 (liabilities) at January 1, 2020 | $ 420.0 | $ (19.9) | $ 663.4 | $ 1,063.5 |
| Gains included in loss from continuing operations (a): | | | | |
| Realized and unrealized gains (losses) on derivative instruments, net | — | (366.1) | 386.7 | 20.6 |
| Realized and unrealized gains due to changes in fair values of certain investments and debt, net | 68.1 | — | — | 68.1 |
| Partial settlement of ITV collar (b) | — | — | (731.2) | (731.2) |
| Settlement of Lionsgate Forward (c) | — | — | (38.0) | (38.0) |
| Additions | 201.6 | — | — | 201.6 |
| Reclassification of liability to held for sale (d) | | 225.6 | — | 225.6 |
| Transfers out of Level 3 | (180.8) | 170.1 | — | (10.7) |
| Foreign currency translation adjustments and other, net | 10.7 | (9.7) | — | 1.0 |
| Balance of net assets at December 31, 2020 | $ 519.6 | $ — | $ 280.9 | $ 800.5 |

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(a) Most of these net gains relate to assets and liabilities that we continue to carry on our consolidated balance sheet as of December 31, 2020.

(b) For additional information regarding the ITV Collar, see note 8.

(c) For additional information regarding the Lionsgate Forward, see note 8.

(d) Represents the reclassification of the derivative liabilities associated with the U.K. JV Entities as of December 31, 2020 to liabilities associated with assets held for sale. For information regarding the held-for-sale presentation of the U.K. JV Entities, see note 6.

## (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, 2020 | December 31, 2020 | December 31, 2019 |
|---|---|---|---|
| | | in millions | |
| Distribution systems | 3 to 30 years | $ 10,264.0 | $ 19,007.2 |
| Customer premises equipment | 3 to 7 years | 1,800.4 | 4,294.7 |
| Support equipment, buildings and land | 2 to 40 years | 4,491.9 | 5,344.3 |
| Total property and equipment, gross | | 16,556.3 | 28,646.2 |
| Accumulated depreciation | | (8,502.2) | (14,802.8) |
| Total property and equipment, net | | $ 8,054.1 | $ 13,843.4 |

Depreciation expense related to our property and equipment was $2,155.6 million, $3,123.5 million and $3,217.1 million during 2020, 2019 and 2018, respectively.

During 2020, 2019 and 2018, we recorded non-cash increases to our property and equipment related to vendor financing arrangements (including amounts related to the U.K. JV Entities) of $1,371.1 million, $1,727.0 million and $2,175.5 million, respectively, which exclude related VAT of $226.7 million, $286.1 million and $347.3 million, respectively, that were also financed under these arrangements.

***Goodwill***

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 | | |
| U.K./Ireland | $ 7,965.4 | $ — | $ (7,918.5) | $ 249.3 | $ 296.2 |
| Switzerland | 2,953.2 | 3,465.7 | — | 397.1 | 6,816.0 |
| Belgium | 2,576.1 | 6.7 | — | 200.9 | 2,783.7 |
| Central and Eastern Europe | 557.4 | — | — | 12.8 | 570.2 |
| Central and Corporate | — | 0.6 | — | — | 0.6 |
| Total | $ 14,052.1 | $ 3,473.0 | $ (7,918.5) | $ 860.1 | $ 10,466.7 |

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(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.

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.

Changes in the carrying amount of our goodwill during 2019 are set forth below:

| | January 1, 2019 | Acquisitions and related adjustments | Foreign currency translation adjustments | December 31, 2019 |
|---|---|---|---|---|
| | | in millions | | |
| U.K./Ireland | $ 7,671.0 | $ — | $ 294.4 | $ 7,965.4 |
| Belgium | 2,576.3 | 48.7 | (48.9) | 2,576.1 |
| Switzerland | 2,903.9 | — | 49.3 | 2,953.2 |
| Central and Eastern Europe | 564.6 | — | (7.2) | 557.4 |
| Total | $ 13,715.8 | $ 48.7 | $ 287.6 | $ 14,052.1 |

***Intangible Assets Subject to Amortization, Net***

The details of our intangible assets subject to amortization, which are included in other assets, net, on our consolidated balance sheets, are set forth below:

| | Estimated useful life at December 31, 2020 | December 31, 2020 | | | December 31, 2019 | | |
|---|---|---|---|---|---|---|---|
| | | Gross carrying amount | Accumulated amortization | Net carrying amount | Gross carrying amount | Accumulated amortization | Net carrying amount |
| | | in millions | | | | | |
| Customer relationships | 5 to 11 years | $ 2,426.6 | $ (246.4) | $ 2,180.2 | $ 3,653.9 | $ (3,363.6) | $ 290.3 |
| Other | 2 to 15 years | 1,072.1 | (366.3) | 705.8 | 563.7 | (281.9) | 281.8 |
| Total | | $ 3,498.7 | $ (612.7) | $ 2,886.0 | $ 4,217.6 | $ (3,645.5) | $ 572.1 |

Amortization expense related to intangible assets with finite useful lives was $175.7 million, $528.7 million and $641.1 million during 2020, 2019 and 2018, respectively. Based on our amortizable intangible asset balances at December 31, 2020, we expect that amortization expense will be as follows for the next five years and thereafter (in millions):

| | |
|---|---|
| 2021 | $ 449.6 |
| 2022 | 428.9 |
| 2023 | 417.8 |
| 2024 | 405.9 |
| 2025 | 399.1 |
| Thereafter | 784.7 |
| Total | $ 2,886.0 |

## (11) Debt

The U.S. dollar equivalents of the components of our debt are as follows:

| | December 31, 2020 | | | Principal amount | |
|---|---|---|---|---|---|
| | Weighted average interest rate (a) | Unused borrowing capacity (b) | | December 31, | |
| | | Borrowing currency | U.S. $ equivalent | 2020 | 2019 |
| | | in millions | | | |
| UPC Holding Bank Facility (c) | 3.32 % | € 716.6 | $ 876.0 | $ 4,767.1 | $ — |
| UPCB SPE Notes | 3.80 % | — | — | 1,393.7 | 2,420.1 |
| UPC Holding Senior Notes | 4.56 % | — | — | 1,261.5 | 1,202.3 |
| Telenet Credit Facility (d) | 2.19 % | € 555.0 | 678.5 | 3,652.0 | 3,541.4 |
| Telenet Senior Secured Notes | 4.70 % | — | — | 1,660.2 | 1,673.7 |
| Vendor financing (e) (f) | 2.21 % | — | — | 1,142.9 | 1,374.3 |
| ITV Collar Loan | 0.90 % | — | — | 415.9 | 1,435.5 |
| Virgin Media debt (g) | — | (f) | (f) | (f) | 15,693.5 |
| Other (f) (h) | 5.56 % | — | — | 266.3 | 307.3 |
| Total debt before deferred financing costs, discounts and premiums (i) | 3.23 % | | $ 1,554.5 | $ 14,559.6 | $ 27,648.1 |

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, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Total debt before deferred financing costs, discounts and premiums | $ 14,559.6 | $ 27,648.1 |
| Deferred financing costs, discounts and premiums, net | (118.4) | (82.7) |
| Total carrying amount of debt | 14,441.2 | 27,565.4 |
| Finance lease obligations (f) (note 12) | 556.5 | 617.1 |
| Total debt and finance lease obligations | 14,997.7 | 28,182.5 |
| Current maturities of debt and finance lease obligations | (1,130.4) | (3,877.2) |
| Long-term debt and finance lease obligations | $ 13,867.3 | $ 24,305.3 |

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(a) Represents the weighted average interest rate in effect at December 31, 2020 for all borrowings outstanding (except those of the U.K. JV Entities) 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, our weighted average interest rate on our aggregate variable- and fixed-rate indebtedness was 3.64% at December 31, 2020. For information regarding our derivative instruments, see note 8.

(b) Unused borrowing capacity represents the maximum availability under the applicable facility at December 31, 2020 without regard to covenant compliance calculations or other conditions precedent to borrowing. At December 31, 2020, based on the most restrictive applicable leverage covenants, the full amount of unused borrowing capacity was available to be borrowed under each of the respective subsidiary facilities, and based on the most restrictive applicable leverage-based restricted payment tests, there were no restrictions on the respective subsidiary's ability to make loans or distributions from this availability to Liberty Global or its subsidiaries or other equity holders. Upon completion of the relevant December 31, 2020 compliance reporting requirements, we expect the full amount of unused borrowing capacity will continue to be available under each of the respective subsidiary facilities, with no additional restriction to loan or distribute. Our above expectations do not consider any actual or potential changes to our borrowing levels or any amounts loaned or distributed subsequent to December 31, 2020, or the impact of additional amounts that may be available to borrow, loan or distribute under certain defined baskets within each respective facility.

(c) Unused borrowing capacity under the UPC Holding Bank Facility comprises (i) €500.0 million ($611.2 million) under the UPC Revolving Facility (as defined below) and (ii) €216.6 million ($264.8 million) under the Revolving Facility (as defined within *Financing Transactions* below), each of which were undrawn at December 31, 2020. During 2020, as a result of the sale of certain entities within the UPC Holding borrowing group in prior years, and an associated reduction in the outstanding debt and Covenant EBITDA (as defined and described in the related debt agreement) of the remaining UPC Holding borrowing group, UPC Facility AM was cancelled in full and replaced with a new revolving facility which bears interest at a rate of EURIBOR + 2.50% and has a final maturity date of May 31, 2026 (the **UPC Revolving Facility**).

(d) Unused borrowing capacity under the Telenet Credit Facility comprises (i) €510.0 million ($623.5 million) under the Telenet Revolving Facility I (as defined below), (ii) €25.0 million ($30.6 million) under the Telenet Overdraft Facility and (iii) €20.0 million ($24.4 million) under the Telenet Revolving Facility, each of which were undrawn at December 31, 2020. During 2020, Telenet Facility AG and Telenet Facility AP were cancelled in full and replaced with a single revolving facility which bears interest at a rate of EURIBOR + 2.25%, is subject to a EURIBOR floor of 0.0% and has a final maturity date of May 31, 2026 (the **Telenet Revolving Facility I**). In addition, during 2020, certain lenders under the Telenet Revolving Facility agreed to extend and reprice their commitments and as a result, the Telenet Revolving Facility, as amended, bears interest at a rate of EURIBOR + 2.25%, is subject to a EURIBOR floor of 0.0% and has a final maturity date of September 30, 2026.

(e) 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 on our consolidated balance sheet. These obligations are generally due within one year and include VAT that was also financed under these arrangements. Repayments of vendor financing obligations are included in repayments and repurchases of debt and finance lease obligations in our consolidated statements of cash flows.

(f) In connection with the pending formation of the U.K. JV, the outstanding third-party debt of the U.K. JV Entities has been classified as liabilities associated with assets held for sale on our December 31, 2020 consolidated balance sheet. For information regarding the pending formation of the U.K. JV and the held-for-sale presentation of the U.K. JV Entities, see note 6.

(g) The December 31, 2019 amount includes $264.6 million of debt collateralized by certain trade receivables of Virgin Media (**VM Receivables Financing**). During 2020, the amount outstanding under the VM Receivables Financing was repaid, and the associated trade receivables were sold to a third party (the **VM Receivables Financing Sale**).

(h) The December 31, 2019 amount includes $55.3 million of principal borrowings outstanding under the Lionsgate Loan. During 2020, we cash settled the outstanding amount under the Lionsgate Loan, as further described in note 8.

(i) As of December 31, 2020 and 2019, our debt had an estimated fair value of $14.7 billion (excluding the U.K. JV Entities) and $28.4 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) or, when quoted market prices are unavailable or not considered indicative of fair value, discounted cash flow models (mostly Level 2 of the fair value hierarchy). The discount rates used in the cash flow models are based on the market interest rates and estimated credit spreads of the applicable entity, to the extent available, and other relevant factors. For additional information regarding fair value hierarchies, see note 9.

### *General Information*

At December 31, 2020, 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 Virgin Media, 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, 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**), most of which are 100% owned by third parties, for the primary purpose of facilitating the offering of senior secured notes, which we collectively refer to as the "**SPE Notes**."

The SPEs used the proceeds from the issuance of SPE Notes to fund term loan facilities under the credit facilities made available to their respective borrowing group (as further described below), 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 SPE for which the relevant borrowing entity is the primary beneficiary and are consolidated by the relevant parent entities, including Liberty Global. As a result, the amounts outstanding under the Funded Facilities are eliminated in the respective borrowing group's and Liberty Global's consolidated financial statements. At December 31, 2020, we had outstanding SPE Notes issued by entities consolidated by UPC Holding, collectively the "**UPCB SPEs**".

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 and applicable interest rate 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.

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 SPE Notes 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 SPE Notes call date using the discount rate (as specified in the applicable SPE Indenture) 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 SPE Notes call date, the SPE will redeem an aggregate principal amount of its respective SPE Notes equal to the principal amount of the related Funded Facility prepaid 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 2020, 2019 and 2018. A portion of our financing transactions may include non-cash borrowings and repayments. During 2020, 2019 and 2018, non-cash borrowings and repayments aggregated $3,525.2 million, $3,300.2 million and $2,583.3 million, respectively, including amounts related to the U.K. JV Entities.

***UPC Holding - 2020 Financing Transactions***

In January 2020, UPC Holding entered into (i) a $700.0 million term loan facility (**UPC Facility AT**) and (ii) a €400.0 million ($489.0 million) term loan facility (**UPC Facility AU**). UPC Facility AT was issued at 99.75% of par, matures on April 30, 2028 and bears interest at a rate of LIBOR + 2.25%, subject to a LIBOR floor of 0.0%. UPC Facility AU was issued at 99.875% of par, matures on April 30, 2029 and bears interest at a rate of EURIBOR + 2.50%, subject to a EURIBOR floor of 0.0%. The net proceeds from UPC Facility AT and UPC Facility AU were used to prepay in full the $1,140.0 million outstanding principal amount under UPC Facility AL, together with accrued and unpaid interest and the related prepayment premiums, which was owed to UPCB Finance IV and, in turn, UPCB Finance IV used such proceeds to redeem in full the $1,140.0 million outstanding principal amount of UPCB Finance IV Dollar Notes. In connection with this transaction, UPC Holding recognized a loss on debt extinguishment of $35.6 million related to (a) the payment of $30.7 million of redemption premiums and (b) the write-off of $4.9 million of unamortized deferred financing costs and discounts.

In August 2020, in connection with the Sunrise Acquisition, UPC Holding entered into (i) a $1,300.0 million term loan facility (**UPC Facility AV**), (ii) a €400.0 million ($489.0 million) term loan facility (**UPC Facility AW**), (iii) a $1,300.0 million term loan facility (**UPC Facility AV1**), (iv) a €400.0 million term loan facility (**UPC Facility AW1**) and (v) a €236.4 million ($289.0 million) equivalent multi-currency revolving facility, part of which has been made available as an ancillary facility (the **Revolving Facility**, and together with UPC Facility AV, UPC Facility AW, UPC Facility AV1 and UPC Facility AW1, the **UPC Sunrise Facilities**). UPC Facility AV and UPC Facility AV1 were each issued at 99.0% of par, mature on January 31, 2029 and bear interest at a rate of LIBOR + 3.50%, subject to a LIBOR floor of 0.0%. UPC Facility AW and UPC Facility AW1 were each issued at 98.5% of par, mature on January 31, 2029 and bear interest at a rate of EURIBOR + 3.50%, subject to a EURIBOR floor of 0.0%. The Revolving Facility matures on May 31, 2026 and bears interest at a rate of EURIBOR + 2.50%. The Revolving Facility, which is only available to be utilized by the borrowers under UPC Facility AV1 and UPC Facility AW1 and the entities acquired in the Sunrise Acquisition, can be used for ongoing working capital requirements and general corporate purposes.

In November 2020, upon completion of the Sunrise Acquisition, the proceeds from (i) UPC Facility AV and UPC Facility AW, together with existing liquidity of Liberty Global, were used to fund the Offer and (ii) UPC Facility AV1 and UPC Facility AW1 were used to refinance the existing debt of Sunrise, as further described in note 5. In connection with these transactions, UPC Holding recognized a net loss on debt extinguishment of $7.5 million primarily related to (a) the payment of $13.1 million of redemption premiums and (b) the write-off of $5.2 million of unamortized deferred financing costs, discounts and premiums.

***UPC Holding - 2019 and 2018 Financing Transactions***

During 2019 and 2018, 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 $15.4 million and $8.9 million during 2019 and 2018, respectively. These losses include (i) the write-off of unamortized deferred financing costs and discounts of $15.4 million and $6.9 million, respectively, and (ii) during 2018, the payment of $2.0 million of redemption premiums.

***Telenet - 2020 Financing Transactions***

In January 2020, Telenet entered into (i) a $2,295.0 million term loan facility (**Telenet Facility AR**) and (ii) a €1,110.0 million ($1,357.0 million) term loan facility (**Telenet Facility AQ**). Telenet Facility AR was issued at 99.75% of par, matures on April 30, 2028 and bears interest at a rate of LIBOR + 2.0%, subject to a LIBOR floor of 0.0%. Telenet Facility AQ was issued at par, matures on April 30, 2029 and bears interest at a rate of EURIBOR + 2.25%, subject to a EURIBOR floor of 0.0%. The net proceeds from Telenet Facility AR and Telenet Facility AQ, together with existing cash, were used to prepay in full (a) the $2,295.0 million outstanding principal amount under Telenet Facility AN and (b) the €1,110.0 million outstanding principal amount under Telenet Facility AO. In connection with these transactions, Telenet recognized a net loss on debt extinguishment of $18.9 million related to the write-off of unamortized deferred financing costs, discounts and premiums.

***Telenet - 2019 and 2018 Financing Transactions***

During 2019 and 2018, 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 $54.7 million and $31.5 million during 2019 and 2018, respectively. These losses include (i) the payment of redemption premiums of $50.4 million and $19.3 million, respectively, and (ii) the write-off of unamortized deferred financing costs and discounts of $4.3 million and $12.2 million, respectively.

***Virgin Media - 2020 Financing Transactions***

In connection with the pending formation of the U.K. JV, the outstanding third-party debt of Virgin Media and certain of its subsidiaries has been classified as liabilities associated with assets held for sale on our December 31, 2020 consolidated balance sheet. For information regarding the pending formation of the U.K. JV and the held-for-sale presentation of the U.K. JV Entities, see note 6.

*Trade Receivables Transaction*. In May 2020, Virgin Media Trade Receivables Financing plc, a third-party special purpose financing entity, was created for the purpose of facilitating the offering of certain notes. These notes are collateralized by certain trade receivables of Virgin Media, creating a variable interest in which Virgin Media is the primary beneficiary and, accordingly, Virgin Media, and ultimately Liberty Global, are required to consolidate Virgin Media Trade Receivables Financing plc. The offering of these notes resulted in net proceeds of £214.4 million ($292.7 million) (the **May 2020 Proceeds**).

*Senior Notes Transactions.* In June 2020, Virgin Media issued $675.0 million principal amount of U.S. dollar-denominated senior notes (the **2030 VM Dollar Senior Notes**). The 2030 VM Dollar Senior Notes were issued at par, mature on July 15, 2030 and bear interest at a rate of 5.0%. The net proceeds from the issuance of these notes, together with the May 2020 Proceeds, were used to redeem in full (i) €460.0 million ($562.3 million) outstanding principal amount of 2025 VM Euro Senior Notes and (ii) $388.7 million outstanding principal amount of 2025 VM Dollar Senior Notes. Virgin Media then issued (a) an additional $250.0 million principal amount of 2030 VM Dollar Senior Notes at 101% of par and (b) €500.0 million ($611.2 million) principal amount of euro-denominated senior notes (the **2030 VM Euro Senior Notes**). The 2030 VM Euro Senior Notes were issued at par, mature on July 15, 2030 and bear interest at a rate of 3.75%. The net proceeds from the issuance of these notes were used (1) to redeem in full (A) $497.0 million outstanding principal amount of 2024 VM Dollar Senior Notes, (B) $71.6 million outstanding principal amount of 2022 VM 4.875% Dollar Senior Notes, (C) $51.5 million outstanding principal amount of 2022 VM 5.25% Dollar Senior Notes and (D) £44.1 million ($60.2 million) outstanding principal amount of 2022 VM Sterling Senior Notes and (2) for general corporate purposes. In connection with these transactions, Virgin Media recognized a net loss on debt extinguishment of $57.5 million related to (I) the payment of $50.8

million of redemption premiums and (II) the write-off of $6.7 million of unamortized deferred financing costs, discounts and premiums.

*Senior Secured Notes Transactions*. In June 2020, Virgin Media issued (i) $650.0 million principal amount of U.S. dollar-denominated senior secured notes (the **2030 VM Dollar Senior Secured Notes**) and (ii) £450.0 million ($614.3 million) principal amount of sterling-denominated senior secured notes (the **2030 VM 4.125% Sterling Senior Secured Notes**). The 2030 VM Dollar Senior Secured Notes and 2030 VM 4.125% Sterling Senior Secured Notes were each issued at par, mature on August 15, 2030 and bear interest at a rate of 4.5% and 4.125%, respectively. The net proceeds from the issuance of these notes, together with existing cash, were used to (a) redeem in full £525.0 million ($716.7 million) outstanding principal amount of 2027 VM 4.875% Sterling Senior Secured Notes, (b) redeem in full £360.0 million ($491.5 million) outstanding principal amount of 2029 VM 6.25% Sterling Senior Secured Notes and (c) redeem £80.0 million ($109.2 million) of the £521.3 million ($711.7 million) outstanding principal amount of 2025 VM Sterling Senior Secured Notes. In connection with these transactions, Virgin Media recognized a net loss on debt extinguishment of $65.7 million related to (1) the payment of $64.7 million of redemption premiums and (2) the write-off of $1.0 million of unamortized deferred financing costs, discounts and premiums.

In November 2020, Virgin Media issued via a private placement an additional (i) $265.0 million principal amount of 2030 VM Dollar Senior Secured Notes, (ii) £235.0 million ($320.8 million) principal amount of 4.25% sterling-denominated senior secured notes and (iii) £30.0 million ($41.0 million) principal amount of 2030 VM 4.125% Sterling Senior Secured Notes. The net proceeds from the issuance of these notes were used (a) to redeem in full the £441.3 million ($602.5 million) outstanding principal amount of 2025 VM Sterling Senior Secured Notes and (b) for general corporate purposes. In connection with this transaction, Virgin Media recognized a loss on debt extinguishment of $5.3 million related to the payment of redemption premiums.

*Vendor Financing Notes Transactions.* In June 2020, Virgin Media Vendor Financing Notes III Designated Activity Company (**Virgin Media Financing III Company**) and Virgin Media Vendor Financing Notes IV Designated Activity Company (**Virgin Media Financing IV Company**, and together with Virgin Media Financing III Company, the **2020 VM Financing Companies**) were created for the purpose of issuing certain vendor financing notes. The 2020 VM Financing Companies are third-party special purpose financing entities that are not consolidated by Virgin Media or Liberty Global.

Virgin Media Financing III Company issued (i) £500.0 million ($682.6 million) principal amount of 4.875% vendor financing notes at par and (ii) £400.0 million ($546.1 million) principal amount of 4.875% vendor financing notes at 99.5% of par, each due July 15, 2028 (together, the **VM Vendor Financing III Notes**). Virgin Media Financing IV Company issued $500.0 million principal amount of 5.0% vendor financing notes due July 15, 2028 at par (the **VM Vendor Financing IV Notes**, and together with the VM Vendor Financing III Notes, the **June 2020 Vendor Financing Notes**). The net proceeds from the June 2020 Vendor Financing Notes were used by the 2020 VM Financing Companies to purchase certain vendor-financed receivables owed by Virgin Media and its subsidiaries from previously-existing third-party special purpose financing entities (the **Original VM Financing Companies**) and various other third parties. As a result, Virgin Media paid $42.0 million of redemption premiums, which is included in losses on debt extinguishment, net, in our consolidated statement of operations for the year ended December 31, 2020. To the extent that the proceeds from the June 2020 Vendor Financing Notes exceed the amount of vendor-financed receivables available to be purchased from the Original VM Financing Companies and various other third parties, the excess proceeds are used to fund excess cash facilities under certain credit facilities of Virgin Media. As additional vendor financed receivables become available for purchase, the 2020 VM Financing Companies can request that Virgin Media repay any amounts available under these excess cash facilities.

***Virgin Media - 2019 and 2018 Financing Transactions***

During 2019 and 2018, Virgin Media completed a number of financing transactions that generally resulted in lower interest rates and extended maturities. In connection with these transactions, Virgin Media recognized losses on debt extinguishment of $144.6 million and $36.4 million during 2019 and 2018, respectively. These losses include (i) the payment of redemption premiums of $121.8 million and $28.2 million, respectively, and (ii) the write-off of net unamortized deferred financing costs, discounts and premiums of $22.8 million and $8.2 million, respectively.

***Other 2020 Financing Transactions***

In September 2020, in connection with the pending formation of the U.K. JV, certain subsidiaries of Liberty Global completed various financing transactions, as further described below. Due to the held-for-sale presentation of the U.K. JV Entities, the results of the below transactions have been classified as liabilities associated with assets held for sale on our December 31, 2020 consolidated balance sheet. For additional information regarding the pending formation of the U.K. JV and the held-for-sale presentation of the U.K. JV Entities, see note 6.

*Senior Secured Notes Transactions.* Certain of the U.K. JV Entities outside of the Virgin Media borrowing group issued (i) $1,350.0 million principal amount of U.S. dollar-denominated senior secured notes (the **2031 VM O2 Dollar Senior Secured Notes**), (ii) €950.0 million ($1,161.4 million) principal amount of euro-denominated senior secured notes (the **2031 VM O2 Euro Senior Secured Notes**) and (iii) £600.0 million ($819.1 million) principal amount of sterling-denominated senior secured notes (the **2029 VM O2 Sterling Senior Secured Notes**, and together with the 2031 VM O2 Dollar Senior Secured Notes and the 2031 VM O2 Euro Senior Secured Notes, the **VM O2 Notes**). The 2031 VM O2 Dollar Senior Secured Notes and 2031 VM O2 Euro Senior Secured Notes were each issued at par, mature on January 31, 2031 and bear interest at a rate of 4.25% and 3.25%, respectively. The 2029 VM O2 Sterling Senior Secured Notes were issued at par, mature on January 31, 2029 and bear interest at a rate of 4.0%. The proceeds from the issuance of the VM O2 Notes were placed into certain escrow accounts (the **Escrowed Proceeds**), which are included in assets held for sale on our December 31, 2020 consolidated balance sheet. Upon formation of the U.K. JV, the Escrowed Proceeds will be used to fund certain facility loans under the existing Virgin Media credit facility agreement to VMED O2 UK Holdco 4 Limited (the **New VM Credit Facility Borrower**), an entity that upon closing of the U.K. JV will be within the Virgin Media senior secured borrowing group. The New VM Credit Facility Borrower will use such loan proceeds, together with the proceeds from the VM O2 Facilities (as defined and described below), for the purpose of (a) funding a dividend, distribution or other payment to VMED O2 UK Limited (which, upon formation of the U.K. JV, will become the ultimate parent company of the U.K. JV), and ultimately to Liberty Global and Telefónica, and (b) paying fees and expenses related to the formation of the U.K. JV.

If the formation of the U.K. JV is not consummated on or before May 7, 2022 (the **Long Stop Date**) or, if the Long Stop Date is postponed in accordance with the terms of the agreement, on or before November 7, 2022, or upon the occurrence of certain other events, the VM O2 Notes will be redeemed at a redemption price equal to 100% of the principal amount of the applicable VM O2 Notes plus accrued and unpaid interest and additional amounts, if any, up to but excluding the date of the redemption.

*Facility Transactions.* In addition to the senior secured notes transactions described above, (i) the New VM Credit Facility Borrower entered into (a) a £1,500.0 million ($2,047.8 million) term loan facility (**VM O2 Facility P**) and (b) a €750.0 million ($916.9 million) term loan facility (**VM O2 Facility R**) and (ii) an entity within the Virgin Media borrowing group entered into a $1,300.0 million term loan facility (**VM O2 Facility Q**, and together with VM O2 Facility P and VM O2 Facility R, the **VM O2 Facilities**). VM O2 Facility P will be issued at par, mature on January 31, 2026 and bear interest at a rate of LIBOR + 2.75%. VM O2 Facility R will be issued at 99.0% of par, mature on January 31, 2029 and bear interest at a rate of EURIBOR + 3.25%, subject to a EURIBOR floor of 0.0%. VM O2 Facility Q will be issued at 98.5% of par, mature on January 31, 2029 and bear interest at a rate of LIBOR + 3.25%, subject to a LIBOR floor of 0.0%.

At December 31, 2020, the VM O2 Facilities were undrawn and are only available to be drawn and utilized upon consummation of the U.K. JV, as further described above. Accordingly, Liberty Global and Virgin Media's unused borrowing capacity at December 31, 2020 excludes the availability under the VM O2 Facilities, as applicable. In the event that the formation of the U.K. JV is not successfully completed, the VM O2 Facilities will be cancelled.

***Maturities of Debt***

Maturities of our debt as of December 31, 2020 are presented below for the named borrowing group, unless otherwise noted, and represent U.S. dollar equivalents based on December 31, 2020 exchange rates. As a result of the held-for-sale presentation of the U.K. JV Entities on our December 31, 2020 consolidated balance sheet, the amounts presented below do not include maturities of the debt obligations of these entities. For information regarding the held-for-sale presentation of the U.K. JV Entities, see note 6.

| | Telenet | UPC Holding (a) | Other (b) | Total |
|---|---|---|---|---|
| | in millions | | | |
| Year ending December 31: | | | | |
| 2021 | $ 443.2 | $ 380.2 | $ 231.0 | $ 1,054.4 |
| 2022 | 11.3 | — | 428.4 | 439.7 |
| 2023 | 12.0 | — | 173.7 | 185.7 |
| 2024 | 11.9 | — | 19.5 | 31.4 |
| 2025 | 12.0 | — | 1.2 | 13.2 |
| Thereafter | 5,412.9 | 7,422.3 | — | 12,835.2 |
| Total debt maturities (c) | 5,903.3 | 7,802.5 | 853.8 | 14,559.6 |
| Deferred financing costs, discounts and premiums, net | (17.2) | (98.5) | (2.7) | (118.4) |
| Total debt | $ 5,886.1 | $ 7,704.0 | $ 851.1 | $ 14,441.2 |
| Current portion | $ 443.2 | $ 380.2 | $ 230.7 | $ 1,054.1 |
| Noncurrent portion | $ 5,442.9 | $ 7,323.8 | $ 620.4 | $ 13,387.1 |

(a) Amounts include the UPCB SPE Notes issued by the UPCB SPEs. As described above, the UPCB SPEs are consolidated by UPC Holding and Liberty Global.

(b) Amounts include $415.9 million related to the ITV Collar Loan. The ITV Collar Loan has various maturity dates through 2022 consistent with the ITV Collar (see notes 7 and 8). We may elect to use cash or the collective value of the related shares and equity-related derivative instrument to settle the remaining amounts under the ITV Collar Loan.

(c) Amounts include vendor financing obligations of $1,142.9 million, as set forth below:

| | Telenet | UPC Holding | Other | Total |
|---|---|---|---|---|
| | in millions | | | |
| Year ending December 31: | | | | |
| 2021 | $ 429.2 | $ 380.2 | $ 149.9 | $ 959.3 |
| 2022 | — | — | 93.6 | 93.6 |
| 2023 | — | — | 69.2 | 69.2 |
| 2024 | — | — | 19.5 | 19.5 |
| 2025 | — | — | 1.3 | 1.3 |
| Total vendor financing maturities | $ 429.2 | $ 380.2 | $ 333.5 | $ 1,142.9 |
| Current portion | $ 429.2 | $ 380.2 | $ 149.9 | $ 959.3 |
| Noncurrent portion | $ — | $ — | $ 183.6 | $ 183.6 |

## (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, 2020 | December 31, 2019 |
|---|---|---|
| | in millions | |
| ROU assets: | | |
| Finance leases (a) | $ 477.8 | $ 531.0 |
| Operating leases (b) | 1,454.7 | 512.7 |
| Total ROU assets | $ 1,932.5 | $ 1,043.7 |
| Lease liabilities: | | |
| Finance leases (c) | $ 556.5 | $ 617.1 |
| Operating leases (d) | 1,447.7 | 545.1 |
| Total lease liabilities | $ 2,004.2 | $ 1,162.2 |

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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, 2020, the weighted average remaining lease term for finance leases was 22.8 years and the weighted average discount rate was 6.0%. During 2020, 2019 and 2018, we recorded non-cash additions to our finance lease ROU assets (including amounts related to the U.K. JV Entities) of $49.7 million, $66.9 million and $102.4 million, respectively.

(b) Our operating lease ROU assets are included in other assets, net, on our consolidated balance sheets. At December 31, 2020, the weighted average remaining lease term for operating leases was 12.8 years and the weighted average discount rate was 5.8%. During 2020 and 2019, we recorded non-cash additions to our operating lease ROU assets (including amounts related to the U.K. JV Entities) of $124.7 million and $88.5 million, respectively.

(c) The current and long-term portions of our finance lease liabilities are included within current portion of debt and finance lease liabilities and long-term debt and finance lease liabilities, respectively, on our consolidated balance sheets.

(d) The current and long-term portions of our operating lease liabilities are included within other accrued and current liabilities and other long-term liabilities, respectively, on our consolidated balance sheets.

A summary of our aggregate lease expense is set forth below:

| | Year ended December 31, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Finance lease expense: | | |
| Depreciation and amortization | $ 75.3 | $ 84.2 |
| Interest expense | 33.4 | 33.8 |
| Total finance lease expense | 108.7 | 118.0 |
| Operating lease expense (a) | 151.1 | 135.7 |
| Short-term lease expense (a) | 6.8 | 8.0 |
| Variable lease expense (b) | 4.6 | 4.8 |
| Total lease expense | $ 271.2 | $ 266.5 |

(a) Our operating lease expense and short-term lease expense are included in other operating expenses, SG&A expenses and impairment, restructuring and other operating items 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.

A summary of our cash outflows from operating and finance leases is set forth below:

| | Year ended December 31, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Cash paid for amounts included in the measurement of lease liabilities: | | |
| Operating cash outflows from operating leases | $ 126.2 | $ 135.5 |
| Operating cash outflows from finance leases | 33.4 | 33.8 |
| Financing cash outflows from finance leases | 98.2 | 60.0 |
| Total cash outflows from operating and finance leases | $ 257.8 | $ 229.3 |

Maturities of our operating and finance lease liabilities as of December 31, 2020 are presented below. As a result of the held-for-sale presentation of the U.K. JV Entities on our December 31, 2020 consolidated balance sheet, the amounts presented below do not include maturities of operating and finance lease liabilities of these entities. For information regarding the held-for-sale presentation of the U.K. JV Entities, see note 6. Amounts represent U.S. dollar equivalents based on December 31, 2020 exchange rates:

| | Operating leases | Finance leases |
|---|---|---|
| | in millions | |
| Year ending December 31: | | |
| 2021 | $ 212.2 | $ 107.2 |
| 2022 | 196.1 | 98.8 |
| 2023 | 184.8 | 101.3 |
| 2024 | 168.8 | 62.2 |
| 2025 | 155.0 | 59.1 |
| Thereafter | 1,190.0 | 292.0 |
| Total payments | 2,106.9 | 720.6 |
| Less: present value discount | (659.2) | (164.1) |
| Present value of lease payments | $ 1,447.7 | $ 556.5 |
| Current portion | $ 180.3 | $ 76.3 |
| Noncurrent portion | $ 1,267.4 | $ 480.2 |

## (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, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| U.K. | $ (1,470.0) | $ (831.0) | $ 330.9 |
| The Netherlands | (606.0) | (662.8) | (321.1) |
| Belgium | 343.5 | 409.3 | 392.4 |
| Luxembourg | 95.5 | (5.3) | 0.7 |
| U.S. | (46.0) | (7.0) | (51.6) |
| Switzerland | (21.2) | 178.5 | 318.8 |
| Intercompany activity with discontinued operations | — | (237.2) | (426.4) |
| Other | (19.4) | (0.5) | (81.9) |
| Total | $ (1,723.6) | $ (1,156.0) | $ 161.8 |

Income tax benefit (expense) consists of:

| | Current | Deferred | Total |
|---|---|---|---|
| | | in millions | |
| 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 | (19.0) | (0.6) | (19.6) |
| Total | $ (4.8) | $ 261.7 | $ 256.9 |
| 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 | (18.2) | (1.1) | (19.3) |
| Total | $ (187.5) | $ (65.5) | $ (253.0) |
| Year ended December 31, 2018: | | | |
| U.S. (a) | $ (957.5) | $ 7.6 | $ (949.9) |
| The Netherlands | 14.2 | (519.4) | (505.2) |
| Belgium | (153.9) | 41.6 | (112.3) |
| U.K. | (7.2) | 32.2 | 25.0 |
| Switzerland | (16.6) | 6.2 | (10.4) |
| Luxembourg | (3.1) | 0.3 | (2.8) |
| Other | (11.1) | (6.6) | (17.7) |
| Total | $ (1,135.2) | $ (438.1) | $ (1,573.3) |

(a) Includes federal and state income taxes. Our U.S. state income taxes were not material during any of the years presented.

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, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Computed "expected" tax benefit (expense) (a) | $ 327.5 | $ 219.6 | $ (30.7) |
| Non-deductible or non-taxable foreign currency exchange results | (395.1) | (26.5) | 132.5 |
| Recognition of previously unrecognized tax benefits | 285.8 | 5.9 | 49.6 |
| Basis and other differences in the treatment of items associated with investments in subsidiaries and affiliates (b) | (248.6) | (167.9) | (360.1) |
| Enacted tax law and rate changes (c) | 248.2 | 19.2 | (13.5) |
| Tax benefit associated with technologies innovation (d) | 62.2 | — | — |
| Non-deductible or non-taxable interest and other expenses | (25.6) | (191.7) | (153.8) |
| Change in valuation allowances | (8.4) | (113.6) | (34.9) |
| Mandatory Repatriation Tax (e) | — | — | (1,137.2) |
| Other, net | 10.9 | 2.0 | (25.2) |
| Total income tax expense | $ 256.9 | $ (253.0) | $ (1,573.3) |

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(a) The statutory or "expected" tax rate is the U.K. rate of 19.0%.

(b) These 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.

(c) 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 balances was recorded during the third quarter of 2020. On December 23, 2020, legislation was enacted in the Netherlands to eliminate the corporate income tax rate reduction that had previously been enacted in December 2019. As a result, the corporate income tax rate remains at 25% in 2021 instead of reducing to 21.7%. Substantially all of the impacts of the new rate change in the Netherlands on our deferred tax balances were recorded during the fourth quarter of 2020, modifying the impacts of the 2019 rate change that were previously recorded during the fourth quarter of 2019. The December 2019 legislation delayed and lessened the corporate income tax rate reduction that had previously been enacted in December 2018, maintaining the 25% rate in 2020 and reducing to 21.7% in 2021 instead of reducing the rate to 22.5% in 2020 and 20.5% in 2021. Substantially all of the impacts of this change on our deferred tax balances were recorded during the fourth quarter of 2019, modifying the impacts of the 2018 rate change that were previously recorded during the fourth quarter of 2018.

(d) The amount reflects the recognition of the innovation income tax deduction in Belgium, including the one-time effect of deductions related to prior periods.

(e) As further discussed below, the liability we have recorded for the Mandatory Repatriation Tax (as defined and described below) is significantly lower than the amount included in our income tax expense due in part to the expected use of carryforward attributes in the U.S., all of which were subject to valuation allowances prior to the initial recognition of the Mandatory Repatriation Tax during the first quarter of 2018.

The components of our net deferred tax assets (liabilities) are as follows:

| | December 31, | |
|---|---|---|
| | 2020 (a) | 2019 |
| | in millions | |
| Deferred tax assets | $ 565.1 | $ 2,457.4 |
| Deferred tax liabilities (b) | (672.9) | (246.4) |
| Net deferred tax asset (liability) | $ (107.8) | $ 2,211.0 |

(a) Due to the held-for-sale presentation of the U.K. JV Entities, amounts as of December 31, 2020 exclude the deferred tax assets and liabilities associated with such entities.

(b) Our deferred tax liabilities are included in other long-term liabilities on our consolidated balance sheets.

The tax effects of temporary differences that give rise to significant portions of the deferred tax assets and deferred tax liabilities are presented below:

| | December 31, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Deferred tax assets: | | |
| Net operating loss and other carryforwards | $ 1,589.8 | $ 4,367.5 |
| Derivative instruments | 272.3 | 113.3 |
| Debt | 218.9 | 231.5 |
| Leases | 204.5 | 58.5 |
| Investments | 194.6 | 136.4 |
| Property and equipment, net | 107.5 | 1,969.0 |
| Other future deductible amounts | 217.6 | 208.8 |
| Deferred tax assets | 2,805.2 | 7,085.0 |
| Valuation allowance | (1,578.9) | (4,235.5) |
| Deferred tax assets, net of valuation allowance | 1,226.3 | 2,849.5 |
| Deferred tax liabilities: | | |
| Intangible assets | (514.7) | (114.1) |
| Property and equipment, net | (243.6) | (169.9) |
| Right of use assets | (204.4) | (56.8) |
| Debt | (182.6) | (65.7) |
| Deferred revenue | (157.0) | (168.1) |
| Other future taxable amounts | (31.8) | (63.9) |
| Deferred tax liabilities | (1,334.1) | (638.5) |
| Net deferred tax asset (liability) | $ (107.8) | $ 2,211.0 |

Our deferred income tax valuation allowance decreased $2,656.6 million in 2020. This decrease reflects the net effect of (i) the impact of the held-for-sale presentation of the U.K. JV Entities (see note 6), (ii) the effect of enacted tax law and rate changes, (iii) a decrease in deferred tax assets, (iv) foreign currency translation adjustments, (v) business acquisitions and (vi) other individually insignificant items.

The significant components of our tax loss carryforwards and related tax assets at December 31, 2020 are as follows:

| Country | Tax loss carryforward | Related tax asset | Expiration date |
|---|---|---|---|
| | in millions | | |
| The Netherlands | $ 3,353.8 | $ 838.4 | 2021-2027 |
| Belgium | 1,342.7 | 335.7 | Indefinite |
| Luxembourg | 980.6 | 256.0 | Various |
| Ireland | 796.5 | 99.8 | Indefinite |
| U.K (a) | 264.3 | 50.2 | Indefinite |
| Other | 46.5 | 9.7 | Various |
| Total | $ 6,784.4 | $ 1,589.8 | |

(a) Due to the held-for-sale presentation of the U.K. JV Entities, amounts exclude the tax loss carryforwards and related tax assets associated with such entities.

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, 2020, 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.

The Tax Cuts and Jobs Act (the **2017 U.S. Tax Act)** was signed into U.S. law on December 22, 2017. Significant changes to the U.S. income tax regime include the imposition of taxes on a one-time deemed mandatory repatriation of earnings and profits of foreign corporations (the **Mandatory Repatriation Tax**) and a new tax on global intangible low-taxed income (the **GILTI Tax**).

The Mandatory Repatriation Tax requires that the aggregate post-1986 earnings and profits of our foreign corporations be included in our U.S. taxable income. The one-time repatriation of undistributed foreign earnings and profits is then taxed at a rate of 15.5% for cash earnings and 8% for non-cash earnings, both as defined in the 2017 U.S. Tax Act, and is payable, interest free, over an eight year period according to a prescribed payment schedule with 45% of the tax due in the last two years. At December 31, 2020 and 2019, after considering the expected use of carryforward tax attributes and other filing positions, our liability for the Mandatory Repatriation Tax was $295.7 million and $357.2 million, respectively.

The GILTI Tax will require our U.S. subsidiaries that are shareholders in foreign corporations to include in their taxable income for each year beginning after December 31, 2017, their pro rata share of global intangible low-taxed income. The GILTI Tax is calculated as the excess of the net foreign corporation income over a deemed return. The GILTI Tax is reported as a period cost when it is incurred.

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 the Netherlands, Poland, the U.K. 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.

The changes in our unrecognized tax benefits are summarized below:

| | 2020 | 2019 | 2018 |
|---|---|---|---|
| | | in millions | |
| Balance at January 1 | $ 664.3 | $ 857.8 | $ 350.4 |
| Reductions for tax positions of prior years | (361.5) | (80.7) | (117.9) |
| Additions based on tax positions related to the current year | 290.9 | 1.8 | 180.0 |
| Additions for tax positions of prior years | 134.4 | 1.0 | 457.4 |
| Reduction related to the held for sale group | (131.8) | — | — |
| Foreign currency translation | 15.4 | (4.3) | (8.5) |
| Settlements with tax authorities | (4.1) | (111.3) | — |
| Lapse of statute of limitations | (2.7) | — | (3.6) |
| Balance at December 31 | $ 604.9 | $ 664.3 | $ 857.8 |

No assurance can be given that any of these tax benefits will be recognized or realized.

As of December 31, 2020, 2019 and 2018, there are $421.5 million, $546.5 million, and $759.8 million 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 2021, it is reasonably possible that the resolution of ongoing examinations by tax authorities, as well as the expiration of statutes of limitation and other items, could result in reductions to our unrecognized tax benefits related to tax positions taken as of December 31, 2020. The amount of any such reductions could range up to $175.0 million, of which an immaterial amount would have a positive impact on our effective tax rate. Other than the potential impacts of these ongoing examinations and the expected expiration of certain statutes of limitation, we do not expect any material changes to our unrecognized tax benefits during 2021. No assurance can be given as to the nature or impact of any changes in our unrecognized tax positions during 2021.

During 2020, 2019 and 2018, the income tax expense of our continuing operations includes net income tax expense of $26.2 million, $22.6 million and $58.9 million, respectively, representing the net accrual of interest and penalties during the period. Our other long-term liabilities include accrued interest and penalties of $139.9 million at December 31, 2020.

## (14) Equity

### *Capitalization*

At December 31, 2020, 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.

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 (12,561,444 shares issued as of December 31, 2020). Additionally, at December 31, 2020, we have reserved the following ordinary shares for the issuance of outstanding share-based incentive awards:

| | Class A | Class B | Class C |
|---|---|---|---|
| Options | 623,572 | — | 3,463,971 |
| SARs | 19,245,884 | — | 40,890,502 |
| RSUs | 2,443,306 | — | 4,878,115 |
| PSUs and PSARS | 5,920,958 | 660,000 | 11,841,916 |

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 and 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 2019 U.K. Companies Act Report dated May 21, 2020, which are our most recent "Relevant Accounts" for the purposes of determining our Distributable Reserves under U.K. law, our Distributable Reserves were $17.1 billion as of December 31, 2019. This amount does not reflect earnings, share repurchases or other activity that occurred in 2020, each of which impacts the amount of our Distributable Reserves.

Our board of directors has approved share repurchase programs for our Liberty Global ordinary shares. Under our share repurchase program, we receive authorization to acquire up to the specified amount (before direct acquisition costs) of Class A and Class C Liberty Global ordinary shares, or other authorized securities, from time to time through open market or privately negotiated transactions, which may include derivative transactions. The timing of the repurchase of shares or other securities pursuant to our equity repurchase programs, which may be suspended or discontinued at any time, is dependent on a variety of factors, including market conditions. At December 31, 2020, the remaining amount authorized for share repurchases was $1.0 billion.

The following table provides details of our share repurchases during 2020, 2019 and 2018:

| | Class A ordinary shares | | Class C ordinary shares | | |
|---|---|---|---|---|---|
| | **Shares repurchased** | **Average price paid per share (a)** | **Shares repurchased** | **Average price paid per share (a)** | **Total cost (a)** |
| | | | | | **in millions** |
| Liberty Global Shares: | | | | | |
| 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 |
| 2018 | 15,649,900 | $ 29.67 | 54,211,059 | $ 28.51 | $ 2,010.0 |

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(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 per share price 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 2020, 2019 and 2018 of €292.4 million, €62.8 million and €600.0 million, respectively. Our share of these dividends was €177.8 million ($205.4 million at the applicable rate), €37.8 million ($42.0 million at the applicable rate) and €351.6 million ($404.8 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, 2020, substantially all of our net assets represented net assets of our subsidiaries that were subject to such limitations.

## (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, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Liberty Global: | | | |
| Performance-based incentive awards (a) | $ 127.4 | $ 134.5 | $ 50.8 |
| Non-performance based incentive awards (b) | 134.1 | 107.6 | 90.1 |
| Other (c) | 46.2 | 39.0 | 43.4 |
| Total Liberty Global | 307.7 | 281.1 | 184.3 |
| Telenet share-based incentive awards (d) | 35.5 | 15.6 | 19.6 |
| Other | 4.8 | 9.1 | 2.1 |
| Total | $ 348.0 | $ 305.8 | $ 206.0 |
| Included in: | | | |
| Other operating expenses | $ 7.6 | $ 3.9 | $ 4.4 |
| SG&A expenses | 340.4 | 301.9 | 201.6 |
| Total | $ 348.0 | $ 305.8 | $ 206.0 |

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(a) Includes share-based compensation expense related to (i) PSUs and (ii) in 2020 and 2019, (a) the 2019 Challenge Performance Awards and (b) the performance-based portion of the 2019 CEO Performance Award, 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 2020, the compensation committee of our board of directors approved the extension of the expiration dates of outstanding SARs and director options granted in 2013 from a seven-year term to a ten-year term in order to align with this new policy. Accordingly, the Black-Scholes fair values of the outstanding awards increased, resulting in the recognition of an aggregate incremental share-based compensation expense of $18.9 million during 2020. 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, 2020, included performance- and non-performance-based stock option awards with respect to 5,001,814 Telenet shares. These stock option awards had a weighted average exercise price of €40.69 ($49.74).

As of December 31, 2020, $244.8 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.

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, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| Assumptions used to estimate fair value of options, SARs and PSARs granted: | | | |
| Risk-free interest rate | 0.13 - 0.47% | 1.59 - 2.45% | 2.68 - 2.92% |
| Expected life | 3.2 - 6.2 years | 3.2 - 6.2 years | 3.0 - 4.2 years |
| Expected volatility | 34.6 - 38.8% | 29.9 - 33.8% | 30.2 - 33.6% |
| Expected dividend yield | none | none | none |
| Weighted average grant-date fair value per share of awards granted: | | | |
| Options | $ 5.92 | $ 8.60 | $ 8.99 |
| SARs | $ 4.19 | $ 6.79 | $ 7.92 |
| PSARs | (a) | $ 6.92 | (a) |
| RSUs | $ 15.66 | $ 24.66 | $ 28.72 |
| RSAs | (a) | $ 25.29 | (a) |
| PSUs | (a) | $ 25.00 | $ 23.60 |
| Total intrinsic value of awards exercised (in millions): | | | |
| Options | $ 1.2 | $ 4.2 | $ 3.8 |
| SARs | (b) | $ 13.6 | $ 22.5 |
| Cash received from exercise of options (in millions) | $ 2.2 | $ 2.3 | $ 5.7 |
| Income tax benefit related to share-based compensation of our continuing operations (in millions) | $ 36.9 | $ 21.0 | $ 18.6 |

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(a) There were no grants of this award type made during the indicated period.

(b) There were no exercises of SARs during the year ended December 31, 2020.

***Share Incentive Plans — Liberty Global Ordinary Shares***

*Incentive Plans*

As of December 31, 2020, 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, 2020, the Liberty Global 2014 Incentive Plan and the Liberty Global 2014 Nonemployee Director Incentive Plan had 60,799,181 and 8,005,545 ordinary shares available for grant, respectively.

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.

*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. Subject to certain terms, the RSAs vested on December 31, 2019. Subject to forfeitures, the satisfaction of performance conditions and certain other terms, 670,000 PSUs vested on May 15, 2020, and the remaining 660,000 PSUs will vest on May 15, 2021. Prior to vesting, our CEO may change the PSUs to a mix of Liberty Global Class A, B or C ordinary shares of comparable value. The performance criteria for the 2019 CEO Performance Award PSUs is 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 a performance period of three years ending on 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.

*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**) 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, 2020. The 2019 PSUs include over- and under-performance payout opportunities should the Adjusted EBITDA CAGR exceed or fail to meet the target, as applicable. A performance range of 50% to 125% of the target Adjusted EBITDA CAGR will generally result in award recipients earning 50% to 150% of their target 2019 PSUs, subject to reduction or forfeiture based on individual performance. The earned 2019 PSUs will vest 50% on April 1, 2021 and 50% on 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, our compensation committee approved the grant of PSUs to executive officers and key employees (the **2016 PSUs**). The performance plan for the 2016 PSUs covered a three-year period that ended on December 31, 2018 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 20). 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 2016 PSUs, as adjusted through the 2017 Award Modification, required delivery of compound annual growth rates of consolidated Adjusted EBITDA CAGR of 6.0% during the three-year performance period for Liberty Global or Liberty Latin America 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 2020 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** | **Aggregate intrinsic value** |
|---|---|---|---|---|
| | | | **in years** | **in millions** |
| Outstanding at January 1, 2020 | 588,258 | $ 29.25 | | |
| Granted | 78,948 | $ 21.86 | | |
| Forfeited | (2,533) | $ 22.65 | | |
| Exercised | (41,101) | $ 13.00 | | |
| Outstanding at December 31, 2020 | 623,572 | $ 29.41 | 3.6 | $ 0.6 |
| Exercisable at December 31, 2020 | 495,900 | $ 30.67 | 2.3 | $ 0.4 |

| **Options — Class C ordinary shares** | **Number of awards** | **Weighted average exercise price** | **Weighted average remaining contractual term** | **Aggregate intrinsic value** |
|---|---|---|---|---|
| | | | **in years** | **in millions** |
| Outstanding at January 1, 2020 | 3,506,568 | $ 25.81 | | |
| Granted | 542,801 | $ 16.98 | | |
| Forfeited | (483,100) | $ 25.38 | | |
| Exercised | (102,298) | $ 12.88 | | |
| Outstanding at December 31, 2020 | 3,463,971 | $ 24.87 | 3.8 | $ 4.8 |
| Exercisable at December 31, 2020 | 2,570,677 | $ 26.41 | 2.3 | $ 3.7 |

| **SARs — Class A ordinary shares** | **Number of awards** | **Weighted average base price** | **Weighted average remaining contractual term** | **Aggregate intrinsic value** |
|---|---|---|---|---|
| | | | **in years** | **in millions** |
| Outstanding at January 1, 2020 | 16,251,617 | $ 31.18 | | |
| Granted | 5,084,564 | $ 16.20 | | |
| Forfeited | (2,085,032) | $ 30.52 | | |
| Exercised | (5,265) | $ 24.90 | | |
| Outstanding at December 31, 2020 | 19,245,884 | $ 27.29 | 5.1 | $ 40.2 |
| Exercisable at December 31, 2020 | 11,367,027 | $ 32.23 | 2.8 | $ — |

| SARs — Class C ordinary shares | Number of awards | Weighted average base price | Weighted average remaining contractual term | Aggregate intrinsic value |
|---|---|---|---|---|
| | | | in years | in millions |
| Outstanding at January 1, 2020 | 35,682,862 | $ 29.77 | | |
| Granted | 10,169,128 | $ 15.28 | | |
| Forfeited | (4,952,165) | $ 28.95 | | |
| Exercised | (9,323) | $ 24.15 | | |
| Outstanding at December 31, 2020 | 40,890,502 | $ 26.27 | 4.9 | $ 83.9 |
| Exercisable at December 31, 2020 | 25,082,821 | $ 30.83 | 2.8 | $ — |

| PSARs — Class A ordinary shares | Number of awards | Weighted average base price | Weighted average remaining contractual term | Aggregate intrinsic value |
|---|---|---|---|---|
| | | | in years | in millions |
| Outstanding at January 1, 2020 | 4,071,616 | $ 25.97 | | |
| Forfeited | (347,946) | $ 25.99 | | |
| Outstanding at December 31, 2020 | 3,723,670 | $ 25.97 | 8.2 | $ — |
| Exercisable at December 31, 2020 | 1,473 | $ 25.97 | 0.8 | $ — |

| PSARs — Class C ordinary shares | Number of awards | Weighted average base price | Weighted average remaining contractual term | Aggregate intrinsic value |
|---|---|---|---|---|
| | | | in years | in millions |
| Outstanding at January 1, 2020 | 8,143,232 | $ 25.22 | | |
| Forfeited | (695,892) | $ 25.24 | | |
| Outstanding at December 31, 2020 | 7,447,340 | $ 25.22 | 8.2 | $ — |
| Exercisable at December 31, 2020 | 2,946 | $ 25.22 | 0.8 | $ — |

| 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, 2020 | 515,496 | $ 27.86 | |
| Granted | 2,234,496 | $ 16.28 | |
| Forfeited | (91,229) | $ 22.62 | |
| Released from restrictions | (215,457) | $ 28.46 | |
| Outstanding at December 31, 2020 | 2,443,306 | $ 17.41 | 2.2 |

| **RSUs — 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, 2020 | 48,786 | $ 26.03 | |
| Released from restrictions | (48,786) | $ 26.03 | |
| Outstanding at December 31, 2020 | — | $ — | — |

| **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, 2020 | 1,026,010 | $ 26.95 | |
| Granted | 4,468,992 | $ 15.36 | |
| Forfeited | (183,173) | $ 21.77 | |
| Released from restrictions | (433,714) | $ 27.58 | |
| Outstanding at December 31, 2020 | 4,878,115 | $ 16.47 | 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, 2020 | 3,388,371 | $ 25.00 | |
| Forfeited | (132,789) | $ 26.04 | |
| Released from restrictions | (1,058,294) | $ 24.01 | |
| Outstanding at December 31, 2020 | 2,197,288 | $ 25.41 | 1.0 |

| **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, 2020 | 1,330,000 | $ 25.29 | |
| Released from restrictions | (670,000) | $ 25.29 | |
| Outstanding at December 31, 2020 | 660,000 | $ 25.29 | 0.4 |

| 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, 2020 | 6,776,048 | $ 24.29 | |
| Forfeited | (263,994) | $ 25.26 | |
| Released from restrictions | (2,117,478) | $ 23.39 | |
| Outstanding at December 31, 2020 | 4,394,576 | $ 24.66 | 1.0 |

***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 and any future vesting of RSUs and PSUs will increase the number of our outstanding ordinary shares.

| | Number of awards | Weighted average exercise or base price | Weighted average remaining contractual term | Aggregate intrinsic value |
|---|---|---|---|---|
| SARs: | | | | |
| Class A: | | | | |
| Outstanding | 1,413,040 | $ 34.11 | 1.7 | $ — |
| Exercisable | 1,396,581 | $ 34.09 | 1.6 | $ — |
| Class C: | | | | |
| Outstanding | 3,142,227 | $ 32.23 | 1.7 | $ — |
| Exercisable | 3,109,319 | $ 32.21 | 1.7 | $ — |

| | Number of awards | Weighted average grant date fair value per share | Weighted average remaining contractual term |
|---|---|---|---|
| Outstanding RSUs and PSUs: | | | |
| Class A: | | | |
| RSUs | 597 | $ 35.32 | 0.4 |
| PSUs | 1,357 | $ 24.90 | 0.8 |
| Class C: | | | |
| RSUs | 1,183 | $ 34.43 | 0.4 |
| PSUs | 2,714 | $ 24.90 | 0.8 |

## (16) Restructuring Liabilities

A summary of changes in our restructuring liabilities during 2020 is set forth in the table below:

| | Employee severance and termination | Office closures | Contract termination | Total |
|---|---|---|---|---|
| | in millions | | | |
| Restructuring liability as of January 1, 2020 | $ 19.1 | $ 2.2 | $ 10.6 | $ 31.9 |
| Restructuring charges | 34.9 | 5.8 | 6.8 | 47.5 |
| Cash paid | (43.8) | (4.9) | (7.5) | (56.2) |
| Reclassification to held for sale (a) | (2.2) | (3.2) | — | (5.4) |
| Foreign currency translation adjustments and other | 2.1 | 0.3 | (0.8) | 1.6 |
| Restructuring liability as of December 31, 2020 | $ 10.1 | $ 0.2 | $ 9.1 | $ 19.4 |
| Current portion | $ 10.1 | $ 0.1 | $ 3.2 | $ 13.4 |
| Noncurrent portion | — | 0.1 | 5.9 | 6.0 |
| Total | $ 10.1 | $ 0.2 | $ 9.1 | $ 19.4 |

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(a) Represents the reclassification of the restructuring liabilities associated with the U.K. JV Entities as of December 31, 2020 to liabilities associated with assets held for sale. For information regarding the held-for-sale presentation of the U.K. JV Entities, see note 6.

Our restructuring charges during 2020 included employee severance and termination costs related to certain reorganization activities of $15.0 million in Switzerland, $12.9 million in U.K./Ireland and $5.9 million in Central and Corporate.

A summary of changes in our restructuring liabilities during 2019 is set forth in the table below:

| | Employee severance and termination | Office closures | Contract termination | Total |
|---|---|---|---|---|
| | in millions | | | |
| Restructuring liability as of January 1, 2019, before effect of accounting change | $ 14.7 | $ 8.5 | $ 17.9 | $ 41.1 |
| Impact of ASU 2016-02 | — | (2.4) | — | (2.4) |
| Restructuring liability as of January 1, 2019, as adjusted for accounting change | 14.7 | 6.1 | 17.9 | 38.7 |
| Restructuring charges | 84.3 | 1.1 | 4.5 | 89.9 |
| Cash paid | (81.3) | (4.4) | (10.9) | (96.6) |
| Foreign currency translation adjustments and other | 1.4 | (0.6) | (0.9) | (0.1) |
| Restructuring liability as of December 31, 2019 | $ 19.1 | $ 2.2 | $ 10.6 | $ 31.9 |
| Current portion | $ 17.6 | $ 1.9 | $ 3.2 | $ 22.7 |
| Noncurrent portion | 1.5 | 0.3 | 7.4 | 9.2 |
| Total | $ 19.1 | $ 2.2 | $ 10.6 | $ 31.9 |

Our restructuring charges during 2019 included employee severance and termination costs related to certain reorganization activities of $40.2 million in U.K./Ireland, $32.3 million in Central and Corporate and $10.5 million in Switzerland.

A summary of changes in our restructuring liabilities during 2018 is set forth in the table below:

| | Employee severance and termination | Office closures | Contract termination | Total |
|---|---|---|---|---|
| | | in millions | | |
| Restructuring liability as of January 1, 2018 | $ 11.3 | $ 9.5 | $ 16.5 | $ 37.3 |
| Restructuring charges | 42.2 | 5.5 | 48.7 | 96.4 |
| Cash paid | (35.5) | (6.0) | (44.7) | (86.2) |
| Foreign currency translation adjustments and other | (3.3) | (0.5) | (2.6) | (6.4) |
| Restructuring liability as of December 31, 2018 | $ 14.7 | $ 8.5 | $ 17.9 | $ 41.1 |
| Current portion | $ 13.3 | $ 4.5 | $ 8.4 | $ 26.2 |
| Noncurrent portion | 1.4 | 4.0 | 9.5 | 14.9 |
| Total | $ 14.7 | $ 8.5 | $ 17.9 | $ 41.1 |

Our restructuring charges during 2018 included (i) $40.5 million of costs in Belgium attributed to the migration of Telenet's mobile subscribers from a mobile virtual network operator (MVNO) arrangement to Telenet's mobile network and (ii) employee severance and termination costs related to certain reorganization and integration activities of $23.7 million in U.K./ Ireland and $14.2 million in Central and Corporate.

In connection with the acquisition of Telenet Group BVBA, formerly known as BASE Company BVBA (**BASE**), Telenet acquired BASE's mobile network in Belgium. As a result, Telenet migrated its mobile subscribers from an MVNO arrangement to the BASE mobile network. In March 2018, Telenet completed this migration and recorded the costs associated with meeting its minimum guarantee commitment under the MVNO agreement as a restructuring charge. Telenet's MVNO agreement expired at the end of 2018.

## (17) 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 the defined benefit plans:

| | December 31, 2020 (a) | December 31, 2019 | December 31, 2018 |
|---|---|---|---|
| | | in millions | |
| Fair value of plan assets (b) | $ 1,196.8 | $ 1,500.0 | $ 1,305.0 |
| Projected benefit obligation | $ 1,302.7 | $ 1,407.5 | $ 1,217.5 |
| Net asset (liability) | $ (105.9) | $ 92.5 | $ 87.5 |

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(a) Due to the held-for-sale presentation of the U.K. JV Entities, amounts as of December 31, 2020 exclude the defined benefit pension plans associated with such entities.

(b) The fair value of plan assets at December 31, 2020 includes $710.3 million and $486.5 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 $14.8 million, $8.6 million and $7.4 million during 2020, 2019 and 2018, respectively, including $33.4 million, $20.9 million and $24.4 million, respectively, representing the service cost component. The 2019 and 2018 amounts exclude aggregate curtailment gains of $1.4 million and $1.1 million, respectively, which are included in impairment, restructuring and other operating items, net, in our consolidated statements of operations.

During 2020, our subsidiaries' contributions to their respective defined benefit plans aggregated $35.7 million, including with respect to the defined benefit pension plans associated with the U.K. JV Entities. Based on December 31, 2020 exchange rates and information available as of that date, we expect this amount to be $55.3 million in 2021.

## (18) 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 | | | | |
|---|---|---|---|---|---|
| | Foreign currency translation adjustments | Pension-related adjustments and other | Accumulated other comprehensive earnings | Noncontrolling interests | Total accumulated other comprehensive earnings |
| | | | in millions | | |
| Balance at January 1, 2018 | $ 1,726.6 | $ (70.6) | $ 1,656.0 | $ (4.2) | $ 1,651.8 |
| Other comprehensive loss | (1,007.3) | (16.9) | (1,024.2) | 0.2 | (1,024.0) |
| Balance at December 31, 2018 | 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 |

The components of other comprehensive earnings (loss), net of taxes, are reflected in our consolidated statements of comprehensive earnings (loss). The following table summarizes the tax effects related to each component of other comprehensive earnings (loss), net, of amounts reclassified to our consolidated statements of operations:

| | Pre-tax amount | Tax benefit | Net-of-tax amount |
|---|---|---|---|
| | | in millions | |
| Year ended December 31, 2020: | | | |
| Foreign currency translation adjustments | $ 2,599.9 | $ (0.2) | $ 2,599.7 |
| Pension-related adjustments and other | (22.5) | 3.8 | (18.7) |
| Other comprehensive earnings | 2,577.4 | 3.6 | 2,581.0 |
| Other comprehensive earnings attributable to noncontrolling interests (a) | (0.9) | 0.3 | (0.6) |
| Other comprehensive earnings attributable to Liberty Global shareholders | $ 2,576.5 | $ 3.9 | $ 2,580.4 |
| Year ended December 31, 2019: | | | |
| Foreign currency translation adjustments | $ 432.2 | $ 3.3 | $ 435.5 |
| Pension-related adjustments and other | (16.7) | 2.3 | (14.4) |
| Other comprehensive earnings from continuing operations | 415.5 | 5.6 | 421.1 |
| Other comprehensive earnings from discontinued operations (b) | 61.1 | (0.1) | 61.0 |
| Other comprehensive earnings | 476.6 | 5.5 | 482.1 |
| Other comprehensive earnings attributable to noncontrolling interests (a) | (1.5) | 0.3 | (1.2) |
| Other comprehensive earnings attributable to Liberty Global shareholders | $ 475.1 | $ 5.8 | $ 480.9 |
| Year ended December 31, 2018: | | | |
| Foreign currency translation adjustments | $ (897.9) | $ — | $ (897.9) |
| Pension-related adjustments and other | (24.4) | 4.4 | (20.0) |
| Other comprehensive loss from continuing operations | (922.3) | 4.4 | (917.9) |
| Other comprehensive loss from discontinued operations (b) | (105.9) | (0.2) | (106.1) |
| Other comprehensive loss | (1,028.2) | 4.2 | (1,024.0) |
| Other comprehensive earnings attributable to noncontrolling interests (a) | (0.3) | 0.1 | (0.2) |
| Other comprehensive loss attributable to Liberty Global shareholders | $ (1,028.5) | $ 4.3 | $ (1,024.2) |

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(a) Amounts represent the noncontrolling interest owners' share of our pension-related adjustments.

(b) For additional information regarding the reclassification of foreign currency translation adjustments included in net earnings, see note 6.

## (19) Commitments and Contingencies

### *Commitments*

In the normal course of business, we have entered 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, 2020. Due to the held-for-sale presentation of the U.K. JV Entities at December 31, 2020, the contractual commitments of these entities have been shown separately in the table below. For information regarding the held-for-sale presentation of the U.K. JV Entities, see note 6. The commitments included in this table do not reflect any liabilities that are included on our December 31, 2020 consolidated balance sheet.

| | Payments due during: | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2021 | 2022 | 2023 | 2024 | 2025 | Thereafter | Total |
| | | | | in millions | | | |
| Network and connectivity commitments | $ 274.6 | $ 96.8 | $ 49.1 | $ 40.2 | $ 38.5 | $ 745.0 | $ 1,244.2 |
| Purchase commitments | 473.3 | 72.9 | 47.6 | 21.2 | 16.0 | 11.6 | 642.6 |
| Programming commitments | 276.9 | 175.3 | 76.4 | 40.9 | 33.6 | 17.6 | 620.7 |
| Other commitments | 3.7 | 3.1 | 2.1 | 1.8 | 0.7 | 2.0 | 13.4 |
| Total | $ 1,028.5 | $ 348.1 | $ 175.2 | $ 104.1 | $ 88.8 | $ 776.2 | $ 2,520.9 |
| U.K. JV Entities | $ 1,705.5 | $ 386.7 | $ 16.1 | $ 5.3 | $ 4.5 | $ 20.0 | $ 2,138.1 |

Network and connectivity commitments include (i) Telenet's commitments for certain operating costs associated with its leased network and (ii) costs associated with certain fiber leasing arrangements in Switzerland. 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 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) aggregated $1,724.0 million, $1,702.4 million and $1,671.4 million during 2020, 2019 and 2018, respectively.

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.

*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.

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 2020, 2019 and 2018, see note 8. For information regarding our defined benefit plans, see note 17.

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.

Rental expense under non-cancellable operating lease arrangements amounted to $111.8 million during 2018. It is expected that in the normal course of business, operating leases that expire generally will be renewed or replaced by similar leases. For information regarding our operating lease arrangements for 2020 and 2019 following the adoption of ASU 2016-02, see note 12.

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 was $44.8 million, $42.6 million and $41.0 million during 2020, 2019 and 2018, 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 this appeal judgment before the Cour de Cassation (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's request for the rescission of the agreement-in-principle and the 2008 PICs Agreement. On June 12, 2009, Proximus appealed this judgment with the Court of Appeal of Antwerp. In this appeal, Proximus is now also seeking 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 ($1.7 billion).

In December 2017, the Court of Appeals of Antwerp issued a judgment rejecting Proximus' claims. In June 2019, Proximus filed an appeal of the Court of Appeals of Antwerp's judgment with the Belgian Supreme Court. In January 2021, the Belgian Supreme Court partially annulled the Court of Appeals of Antwerp's judgment. The case will be referred to the Court of Appeals of Brussels, which will need to make a new decision on the matter within the boundaries of the annulment by the Belgian Supreme Court. A decision on the matter is likely to take several years. 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 asserts 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 is seeking 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, 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.

*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 May 26, 2020, the Belgium Regulatory Authorities adopted a final decision regarding the "reasonable access tariffs" to replace the interim prices, which represents an estimated decrease of 11.5%, as compared to the initial August 1, 2018 interim rates, and is applicable as of July 1, 2020. These rates are expected to evolve over time due to, among other reasons, broadband capacity usage.

The 2018 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 appealed the 2018 Decision, which was rejected in September 2019.

*Virgin Media VAT Matters.* Virgin Media's application of VAT with respect to certain revenue generating activities has been challenged by the U.K. tax authorities (**HMRC**). HMRC claimed that amounts charged to certain Virgin Media customers for payment handling services are subject to VAT, while Virgin Media took the position that such charges were exempt from VAT under existing law. At the time of HMRC's initial challenge in 2009, Virgin Media remitted all related VAT amounts claimed by HMRC, and continued to make such VAT payments pending a ruling on Virgin Media's appeal to the First Tier Tribunal. As the likelihood of loss was not considered probable and Virgin Media believed that the amounts paid would be recoverable, such amounts were recorded as a receivable on our consolidated balance sheet. In January 2020, the First Tier Tribunal rejected our appeal and ruled in favor of HMRC. Accordingly, during the fourth quarter of 2019, we recorded a net provision for litigation of £41.3 million ($54.0 million at the applicable rate). Virgin Media has been granted permission to appeal the case to the Upper Tribunal, with the appeal being stayed pending the outcome of a related case. The timing of the final outcome of the litigation remains uncertain, although any further hearing on this matter is unlikely to occur before the third quarter of 2021.

In a separate matter, on March 19, 2014, the U.K. government announced a change in legislation with respect to the charging of VAT in connection with prompt payment discounts such as those that we offer to our fixed-line telephony customers. This change, which took effect on May 1, 2014, impacted our company and some of our competitors. HMRC issued a decision in the fourth quarter of 2015 challenging our application of the prompt payment discount rules prior to the May 1, 2014 change in legislation. We appealed this decision. As part of the appeal process, we were required to make aggregate payments of £67.0 million ($99.1 million at the respective transaction dates), comprising (i) the challenged amount of £63.7 million (which we paid during the fourth quarter of 2015) and (ii) related interest of £3.3 million (which we paid during the first quarter of 2016). No provision was recorded by our company at that time as the likelihood of loss was not considered to be probable. The aggregate amount paid does not include penalties, which could be significant in the event that penalties were to be assessed. In September 2018, the court rejected our appeal and ruled in favor of HMRC. Accordingly, during the third quarter of 2018, we recorded a provision for litigation of £63.7 million ($83.1 million at the average rate for the period) and related interest expense of £3.3 million ($4.4 million at the average rate for the period) in our consolidated statement of operations. The First Tier Tribunal gave permission to appeal to the Upper Tribunal and we submitted grounds for appeal on February 22, 2019. We subsequently lost the appeal at the Upper Tribunal and in October 2020 our request to further appeal the case was denied by the Court of Appeal.

*UPC Austria Matter*. As further described in note 6, we completed the sale of UPC Austria on July 31, 2018. In October of 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 approximately €70.5 million ($86.2 million) together with an invitation to engage in amicable discussions to resolve the matter in a time and cost effective manner. We since received further asserted claims of approximately €34.7 million ($42.4 million). Discussions regarding the claims are preliminary and 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, (ii) there are significant factual matters to be resolved and (iii) the matter is in a preliminary stage and we have yet to engage in detail with the UPC Austria Sale Counterparties. The acquisition agreement provides for arbitration of disputes in the event the parties are unable to resolve any differences. 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.

*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.

Effective April 1, 2017, the rateable value of our existing network and other assets in the U.K. increased significantly. This increase affects the amount we pay for network infrastructure charges as the annual amount payable to the U.K. government is calculated by applying a percentage multiplier to the rateable value of assets. This change has significantly increased our network infrastructure charges and we expect further but declining increases to these charges through the first quarter of 2022. We continue to believe that these increases are excessive and retain the right of appeal should more favorable agreements be reached with other operators. The rateable value of our network and other assets in the U.K. remains subject to review by the U.K. government.

In 2019, the U.K. Office of Communications regulatory authority (**Ofcom**) issued new regulatory requirements originating from the European Electronic Communications Code, that, effective from February 2020, obligate providers 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 provider 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 provider can offer them. In both cases, we must also set out the price available to new customers for an equivalent service offering. These new requirements adversely impacted our revenue and increased certain of our costs in the U.K. during 2020, and we expect additional and potentially more significant adverse impacts on our operating results in the U.K. in future periods. For additional information, see *Item 1. Business - Regulatory Matters,* included in Part I of this Annual Report on Form 10-K, and *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations - Discussion and Analysis of our Reportable Segments*.

In late February 2020, we became aware that one of our databases did not have adequate access security protection and was accessed without permission. We immediately took remedial actions, ceased access to the database and commenced an investigation. The information in the database did not include any individual's passwords or financial details, such as credit card information or bank account numbers. We have taken steps to inform those individuals impacted and relevant regulatory authorities. The database had information pertaining to approximately 900,000 individuals (including customers and non-customers), representing a number that would be less than 15% of our total customer base. During the fourth quarter of 2020, we were formally notified by the relevant regulatory authorities that they consider this matter to be closed without enforcement action.

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.

## (20) 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 value 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 Adjusted EBITDA from continuing operations to earnings (loss) from continuing operations is presented below.

As of December 31, 2020, our reportable segments are as follows:

**Consolidated:**

- U.K./Ireland
- Belgium
- Switzerland
- Central and Eastern Europe

**Nonconsolidated:**

- VodafoneZiggo JV

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 corporate functions (**Central and Corporate**) primarily include (i) services provided to the VodafoneZiggo JV and various third parties related to transitional service agreements, (ii) sales of customer premises equipment to the VodafoneZiggo JV and (iii) certain centralized functions, including billing systems, network operations, technology, marketing, facilities, finance and other administrative functions.

***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 the VodafoneZiggo JV, we present 100% of its revenue and Adjusted EBITDA in the tables below. Our share of the VodafoneZiggo JV's operating results is included in share of results of affiliates, net, in our consolidated statements of operations.

| | Year ended December 31, | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | | 2019 | | 2018 | |
| | Revenue | Adjusted EBITDA | Revenue | Adjusted EBITDA | Revenue | Adjusted EBITDA |
| | in millions | | | | | |
| U.K./Ireland | $ 6,588.4 | $ 2,672.4 | $ 6,600.3 | $ 2,800.5 | $ 6,875.1 | $ 2,995.5 |
| Belgium | 2,940.9 | 1,413.4 | 2,893.0 | 1,386.1 | 2,993.6 | 1,480.0 |
| Switzerland | 1,573.8 | 693.8 | 1,258.8 | 627.9 | 1,326.0 | 712.0 |
| Central and Eastern Europe | 486.9 | 215.6 | 475.4 | 215.0 | 492.2 | 233.6 |
| Central and Corporate | 394.4 | (99.6) | 316.4 | (171.1) | 274.2 | (257.8) |
| Intersegment eliminations (a) | (4.3) | — | (2.4) | 1.1 | (3.2) | (11.8) |
| Total | $ 11,980.1 | $ 4,895.6 | $ 11,541.5 | $ 4,859.5 | $ 11,957.9 | $ 5,151.5 |
| VodafoneZiggo JV | $ 4,565.4 | $ 2,142.0 | $ 4,407.8 | $ 1,987.7 | $ 4,602.2 | $ 2,009.7 |

(a) Amounts for 2019 and 2018 include transactions between our continuing and discontinued operations prior to the disposal dates of such discontinued operations.

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

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Loss from continuing operations | $ (1,466.7) | $ (1,409.0) | $ (1,411.5) |
| Income tax expense (benefit) | (256.9) | 253.0 | 1,573.3 |
| Other income, net | (76.1) | (114.4) | (43.4) |
| Share of results of affiliates, net | 245.3 | 198.5 | 8.7 |
| Losses on debt extinguishment, net | 233.2 | 216.7 | 65.0 |
| Realized and unrealized losses (gains) due to changes in fair values of certain investments and debt, net | (45.2) | (72.0) | 384.5 |
| Foreign currency transaction losses (gains), net | 1,416.3 | 94.8 | (90.4) |
| Realized and unrealized losses (gains) on derivative instruments, net | 879.3 | 192.0 | (1,125.8) |
| Interest expense | 1,188.5 | 1,385.9 | 1,478.7 |
| Operating income | 2,117.7 | 745.5 | 839.1 |
| Impairment, restructuring and other operating items, net | 98.6 | 156.0 | 248.2 |
| Depreciation and amortization | 2,331.3 | 3,652.2 | 3,858.2 |
| Share-based compensation expense | 348.0 | 305.8 | 206.0 |
| Adjusted EBITDA | $ 4,895.6 | $ 4,859.5 | $ 5,151.5 |

***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, | |
| | 2020 | 2019 | 2020 | 2019 |
| | | in millions | | |
| U.K./Ireland (a) | $ 856.3 | $ 16,170.9 | $ 21,684.7 | $ 20,665.5 |
| Switzerland | 12,258.8 | 4,247.7 | 14,659.9 | 4,647.8 |
| Belgium | 6,221.7 | 5,910.3 | 7,571.1 | 7,148.2 |
| Central and Eastern Europe | 1,074.0 | 1,062.2 | 1,135.4 | 1,135.2 |
| Central and Corporate | 999.1 | 1,079.6 | 14,041.6 | 15,449.6 |
| Total | $ 21,409.9 | $ 28,470.7 | $ 59,092.7 | $ 49,046.3 |
| VodafoneZiggo JV | $ 21,808.3 | $ 20,674.8 | $ 23,630.8 | $ 22,426.5 |

(a) The December 31, 2020 long-lived asset amount relates to (i) Ireland and (ii) certain Liberty Global subsidiaries located in the U.K. that will not be contributed to the U.K. JV pursuant to the Contribution Agreement. As of December 31, 2020, the long-lived assets associated with the U.K. JV Entities are presented in assets held for sale on our consolidated balance sheet.

***Property and Equipment Additions of our Reportable Segments***

The property and equipment additions of our reportable segments (including capital additions financed under 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, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| U.K./Ireland | $ 1,432.7 | $ 1,578.0 | $ 1,988.9 |
| Belgium | 513.6 | 537.2 | 790.8 |
| Switzerland | 302.8 | 277.9 | 249.6 |
| Central and Eastern Europe | 105.5 | 107.0 | 152.8 |
| Central and Corporate (a) | 340.7 | 380.4 | 523.5 |
| Total property and equipment additions | 2,695.3 | 2,880.5 | 3,705.6 |
| Assets acquired under capital-related vendor financing arrangements | (1,371.1) | (1,727.0) | (2,175.5) |
| Assets acquired under finance leases | (49.7) | (66.9) | (102.4) |
| Changes in current liabilities related to capital expenditures | 75.7 | 156.5 | 25.3 |
| Total capital expenditures, net | $ 1,350.2 | $ 1,243.1 | $ 1,453.0 |
| | | | |
| Capital expenditures, net: | | | |
| Third-party payments | $ 1,352.7 | $ 1,323.9 | $ 1,552.7 |
| Proceeds received for transfers to related parties (b) | (2.5) | (80.8) | (99.7) |
| Total capital expenditures, net | $ 1,350.2 | $ 1,243.1 | $ 1,453.0 |
| | | | |
| Property and equipment additions - VodafoneZiggo JV | $ 918.7 | $ 887.9 | $ 988.7 |

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(a) Includes (i) property and equipment additions representing centrally-owned assets that benefit our operating segments and (ii) the net impact of certain centrally-procured network equipment that is ultimately transferred to our operating segments.

(b) Primarily relates to transfers of centrally-procured property and equipment to the VodafoneZiggo JV and, for 2019 and 2018, our discontinued operations.

***Revenue by Major Category***

Our revenue by major category for our consolidated reportable segments is set forth below:

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| Residential revenue: | | | |
| Residential cable revenue (a): | | | |
| Subscription revenue (b): | | | |
| Broadband internet | $ 3,272.5 | $ 3,187.4 | $ 3,226.6 |
| Video | 2,714.5 | 2,723.9 | 2,863.2 |
| Fixed-line telephony | 1,344.6 | 1,413.2 | 1,607.8 |
| Total subscription revenue | 7,331.6 | 7,324.5 | 7,697.6 |
| Non-subscription revenue | 220.7 | 198.1 | 279.1 |
| Total residential cable revenue | 7,552.3 | 7,522.6 | 7,976.7 |
| Residential mobile revenue (c): | | | |
| Subscription revenue (b) | 1,091.8 | 932.1 | 983.5 |
| Non-subscription revenue | 692.0 | 688.2 | 694.8 |
| Total residential mobile revenue | 1,783.8 | 1,620.3 | 1,678.3 |
| Total residential revenue | 9,336.1 | 9,142.9 | 9,655.0 |
| B2B revenue (d): | | | |
| Subscription revenue | 524.5 | 472.5 | 446.4 |
| Non-subscription revenue | 1,524.5 | 1,441.5 | 1,537.1 |
| Total B2B revenue | 2,049.0 | 1,914.0 | 1,983.5 |
| Other revenue (e) | 595.0 | 484.6 | 319.4 |
| Total | $ 11,980.1 | $ 11,541.5 | $ 11,957.9 |

(a) Residential cable subscription revenue includes amounts received from subscribers for ongoing services and the recognition of deferred installation revenue over the associated contract period. Residential cable 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 cable 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 services to certain small or home office (**SOHO**) subscribers. 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 (i) revenue from business broadband internet, video, fixed-line telephony, mobile and data services offered to medium to large enterprises and, on a wholesale basis, to other operators and (ii) revenue from long-term leases of portions of our network.

(e) Other revenue includes, among other items, (i) broadcasting revenue in Belgium and Ireland, (ii) revenue earned from transitional and other services provided to various third parties and (iii) revenue earned from the JV Services and the sale of customer premises equipment to the VodafoneZiggo JV.

***Geographic Segments***

The revenue of our geographic segments is set forth below:

| | Year ended December 31, | | |
|---|---|---|---|
| | 2020 | 2019 | 2018 |
| | | in millions | |
| U.K. | $ 6,076.7 | $ 6,086.2 | $ 6,351.2 |
| Belgium | 2,940.9 | 2,893.0 | 2,993.6 |
| Switzerland | 1,573.8 | 1,258.8 | 1,326.0 |
| Ireland | 511.7 | 514.1 | 523.9 |
| Poland | 436.2 | 425.7 | 440.7 |
| Slovakia | 50.7 | 49.7 | 51.5 |
| Other, including intersegment eliminations | 390.1 | 314.0 | 271.0 |
| Total | $ 11,980.1 | $ 11,541.5 | $ 11,957.9 |
| VodafoneZiggo JV (the Netherlands) | $ 4,565.4 | $ 4,407.8 | $ 4,602.2 |

The long-lived assets of our geographic segments are set forth below:

| | December 31, | |
|---|---|---|
| | 2020 | 2019 |
| | in millions | |
| Switzerland | $ 12,258.8 | $ 4,247.7 |
| Belgium | 6,221.7 | 5,910.3 |
| Poland | 938.5 | 937.0 |
| Ireland | 817.3 | 748.5 |
| Slovakia | 135.5 | 125.2 |
| U.K. (a) | 39.0 | 15,422.4 |
| U.S. and other (b) | 999.1 | 1,079.6 |
| Total | $ 21,409.9 | $ 28,470.7 |
| VodafoneZiggo JV (the Netherlands) | $ 21,808.3 | $ 20,674.8 |

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(a) The December 31, 2020 amount relates to certain Liberty Global subsidiaries located in the U.K. that will not be contributed to the U.K. JV pursuant to the Contribution Agreement. As of December 31, 2020, the long-lived assets associated with the U.K. JV Entities are presented in assets held for sale on our consolidated balance sheet.

(b) Primarily relates to certain long-lived assets included in Central and Corporate.

## 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 2021 Annual Meeting of Shareholders, which we intend to hold during the second quarter of 2021.

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

We intend to file our definitive proxy statement for our 2021 Annual Meeting of Shareholders with the Securities and Exchange Commission on or before April 30, 2021.

## 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, 2020 with respect to our ordinary shares that are authorized for issuance under our equity compensation plans.

*Equity Compensation Plan Information*

| Plan Category | Number of securities to be issued upon exercise of outstanding options, warrants and rights (1)(2) | Weighted average exercise price of outstanding options, warrants and rights (1)(2) | Number of securities available for future issuance under equity compensation plans (excluding securities reflected in the first column) |
|---|---|---|---|
| **Equity compensation plans approved by security holders:** | | | |
| **Liberty Global 2014 Incentive Plan (3):** | | | |
| Total ordinary shares available for issuance | | | 60,799,181 |
| Liberty Global Class A ordinary shares | 21,670,557 | $ 27.40 | |
| Liberty Global Class C ordinary shares | 43,417,036 | $ 26.43 | |
| **Liberty Global 2014 Nonemployee Director Incentive Plan (4):** | | | |
| Total ordinary shares available for issuance | | | 8,005,545 |
| Liberty Global Class A ordinary shares | 515,460 | $ 30.84 | |
| Liberty Global Class C ordinary shares | 1,792,847 | $ 25.78 | |
| **Liberty Global 2005 Incentive Plan (5):** | | | |
| Liberty Global Class A ordinary shares | 2,620,461 | $ 28.15 | |
| Liberty Global Class C ordinary shares | 7,789,378 | $ 26.71 | |
| **Liberty Global 2005 Director Incentive Plan (5):** | | | |
| Liberty Global Class A ordinary shares | 72,000 | $ 25.64 | |
| Liberty Global Class C ordinary shares | 224,600 | $ 24.31 | |
| **VM Incentive Plan (5):** | | | |
| Liberty Global Class A ordinary shares | 127,688 | $ 25.69 | |
| Liberty Global Class C ordinary shares | 1,720,179 | $ 24.49 | |
| **Equity compensation plans not approved by security holders:** | | | |
| None | — | | — |
| **Totals:** | | | |
| Total ordinary shares available for issuance | | | 68,804,726 |
| Liberty Global Class A ordinary shares | 25,006,166 | | |
| Liberty Global Class C ordinary shares | 54,944,040 | | |

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(1) This table includes (i) SARs and PSARs with respect to 20,658,924 and 3,723,670 Liberty Global Class A shares, respectively, and 44,032,729 and 7,447,340 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, 2020 and excluding any related tax effects, 1,658,827 and 3,548,393 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, 2020. 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 4,642,548, 660,000 and 9,276,588, Liberty Global Class A, Liberty Global Class B 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, 2020, an aggregate of 60,799,181 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, 2020, an aggregate of 8,005,545 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-45 of this Annual Report on Form 10-K.

(a) (2) FINANCIAL STATEMENT SCHEDULES

The financial statement schedules required under this Item are as follows:



(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)).

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 New York 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, 3019 (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 I plc as the Additional Facility U Lender (incorporated by reference to Exhibit 4.3 to the September 30, 2020 8-K).

4.34 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)).

4.35 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)).

4.36 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)).

4.37 SFA/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)).

4.38 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)).

4.39 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 2019 Performance Incentive Plan for executive officers under the Incentive Plan (a 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 5, 2019 (File No. 001-35961)).

10.16 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)).

10.17 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)).

10.18 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).

10.19 Personal Usage of Aircraft Policy, restated June 7, 2013 (incorporated by reference to Exhibit 10.31 to the 2016 10-K).

10.20 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)).

10.21 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)).

10.22 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)).

10.23 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)).

10.24 Form of Performance Share Appreciation Rights Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.2 to the August 2019 10-Q).

10.25 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).

10.26 Form of Share Appreciation Rights Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.5 to the August 2019 10-Q).

10.27 Form of Performance Share Units Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.7 to the August 2019 10-Q).

10.28 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).

10.29 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).

10.30 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).

10.31 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).

10.32 Form of Restricted Share Units Agreement (SHIP) under the Incentive Plan (incorporated by reference to Exhibit 10.6 to the November 2019 10-Q).

10.33 Form of Restricted Share Units Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.3 to the November 2019 10-Q).

10.34 Form of Performance Restricted Share Units Agreement under the Incentive Plan (incorporated by reference to Exhibit 10.4 to the November 2019 10-Q).

10.35 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).

10.36 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)).

10.37 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)).

10.38 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)).

10.39 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)).

10.40 Amended and Restated Contribution and Transfer Agreement, dated July 21, 2016, as amended and restated December 31, 2016, by and among, Liberty Global Europe Holding B.V., the Registrant, Vodafone International Holdings B.V., Vodafone Group Plc and Lynx Global Europe II B.V. (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed January 6, 2017 (File No. 001-35961)(the January 2017 8-K)).

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 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)).

10.43 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)).

10.44 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).

21 -- List of Subsidiaries*

23 -- Consent of Experts and Counsel:

23.1 Consent of KPMG LLP*

23.2 Consent of KPMG Accountants N.V.**

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)*

31.3 Certification of President and Chief Executive Officer**

31.4 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)** |

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* Filed with the Registrant's Form 10-K dated February 16, 2021

** 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

**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 16, 2021 / March 30, 2021*

/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.

| Signature | Title | Date |
|---|---|---|
| /s/ JOHN C. MALONE<br>John C. Malone | Chairman of the Board | February 16, 2021 / March 30, 2021* |
| /s/ MICHAEL T. FRIES<br>Michael T. Fries | President, Chief Executive Officer and Director | February 16, 2021 / March 30, 2021* |
| ANDREW J. COLE<br>Andrew J. Cole | Director | February 16, 2021* |
| /s/ MIRANDA CURTIS<br>Miranda Curtis | Director | February 16, 2021 / March 30, 2021* |
| /s/ JOHN W. DICK<br>John W. Dick | Director | February 16, 2021 / March 30, 2021* |
| /s/ PAUL A. GOULD<br>Paul A. Gould | Director | February 16, 2021 / March 30, 2021* |
| /s/ RICHARD R. GREEN<br>Richard R. Green | Director | February 16, 2021 / March 30, 2021* |
| /s/ DAVID E. RAPLEY<br>David E. Rapley | Director | February 16, 2021 / March 30, 2021* |
| /s/ LARRY E. ROMRELL<br>Larry E. Romrell | Director | February 16, 2021 / March 30, 2021* |
| /s/ J. DAVID WARGO<br>J. David Wargo | Director | February 16, 2021 / March 30, 2021* |
| /s/ CHARLES H.R. BRACKEN<br>Charles H.R. Bracken | Executive Vice President and Chief Financial Officer | February 16, 2021 / March 30, 2021* |
| /s/ JASON WALDRON<br>Jason Waldron | Senior Vice President and Chief Accounting Officer | February 16, 2021 / March 30, 2021* |

* Our 2020 Annual Report on Form 10-K/A was originally filed with the Securities and Exchange Commission on February 16, 2021 and amended on March 30, 2021.