

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

Form 10-K

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

For the fiscal year ended December 31, 2022

OR

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

For the transition period from to

Commission file number 001-35961



Liberty Global plc

(Exact name of Registrant as specified in its charter)

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

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

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

W6 8BS
(Zip Code)

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

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

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

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

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

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

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

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months. Yes No

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

Large Accelerated Filer Accelerated Filer Non-Accelerated Filer Smaller Reporting Company Emerging Growth Company

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

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

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

State the aggregate market value of the voting and non-voting common equity held by non-affiliates, computed by reference to the price at which the common equity was last sold, or the average bid and ask price of such common equity, as of the last business day of the Registrant's most recently completed second fiscal quarter: \$9.7 billion.

The number of outstanding ordinary shares of Liberty Global plc as of January 31, 2023 was: 171,931,486 shares of class A ordinary shares, 12,994,000 shares of class B ordinary shares and 271,214,310 shares of class C ordinary shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for the Registrant's 2023 Annual General Meeting of Shareholders are incorporated by reference in Part III of this Form 10-K.

LIBERTY GLOBAL PLC
2022 ANNUAL REPORT ON FORM 10-K
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PART I

Item 1. BUSINESS

Who We Are

We are Liberty Global plc (**Liberty Global**), an international converged fixed and mobile communications company, providing world-class connectivity and entertainment services to our residential and business customers. We are focused on building fixed-mobile convergence national champions in our core European markets, and we are constantly striving to enhance and simplify our customers' lives through quality products and services that give them the freedom to connect, converse, work and be entertained anytime, anywhere they choose. To that end, we deliver market-leading connectivity and entertainment products through next-generation networks that connect retail and wholesale customers subscribing to over 86 million (at December 31, 2022) broadband internet, video, fixed-line telephony and mobile services across our operating companies. Our primary business operations are listed below, all of which we consolidate, with the exception of the VMO2 JV and the VodafoneZiggo JV (each as defined below). Additionally, our ventures arm, Liberty Global Ventures, has investments in more than 75 companies in the fields of content, technology and infrastructure, including strategic stakes in companies such as Plume Design, Inc. (**Plume**), ITV plc (**ITV**), Televisa Univision, Inc. (**Televisa Univision**), AE Group Sàrl (**AtlasEdge**) and Formula E Holdings Ltd. (**Formula E**).

Primary Business Operations:

<u>Brand</u>	<u>Entity</u>	<u>Location</u>	<u>Ownership⁽¹⁾</u>
	Sunrise	Switzerland	100.0%
	Telenet	Belgium	61.1%
	Virgin Media	Ireland	100.0%
	UPC Slovakia	Slovakia	100.0%
	Virgin Media O2	United Kingdom (U.K.)	50.0%
	VodafoneZiggo	Netherlands	50.0%

(1) As of December 31, 2022.

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 this filing on Form 10-K, except where context dictates otherwise, 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 and any joint ventures. Unless otherwise indicated, convenience translations into United States (**U.S.**) dollars are calculated as of December 31, 2022, and operational data, including subscriber statistics and ownership percentages, are as of December 31, 2022.

Acquisitions and Dispositions

We have completed a number of strategic acquisitions, dispositions and joint ventures over the last several years. We made or entered into these acquisitions, dispositions and joint ventures in order to execute on our strategy to concentrate on markets where we can focus on creating national champion converged businesses in core markets and unlock significant synergies.

Acquisitions. One of our recent significant acquisitions includes:

- On November 11, 2020, we completed the acquisition of Sunrise Communications Group AG (**Sunrise**) through the settlement of the all cash public tender offer to acquire all of the outstanding shares of Sunrise (the **Sunrise Acquisition**). In April 2021, we completed a statutory “squeeze-out” procedure, under applicable Swiss law, to acquire the remaining Sunrise Shares that were not acquired pursuant to the tender offer and, accordingly, we now hold 100% of the share capital of Sunrise. Our combined business in Switzerland is now referred to as Sunrise.

Joint Ventures. Our significant joint ventures include:

- On December 15, 2022, we contributed cash to a newly-formed joint venture in the U.K. (the **nexfibre JV**) that is anticipated to roll-out a new fiber network to 5-7 million new homes in the U.K. that are outside the existing footprint of the VMO2 JV (as defined below). We beneficially own 25% of the nexfibre JV, Telefónica (as defined below) beneficially owns 25% and InfraVia Capital Partners (**InfraVia**) beneficially owns the remaining 50%. We account for our 25% interest in the nexfibre JV as an equity method investment.
- On September 1, 2021, we (i) contributed certain assets and liabilities to a newly-formed 50:50 joint venture (the **AtlasEdge JV**) that was established for the purpose of acquiring and commercializing European technical real estate for edge colocation and hosting services and (ii) sold certain other assets to the AtlasEdge JV. In addition, we sold certain additional assets to the AtlasEdge JV during the fourth quarter of 2021. We account for our interest in the AtlasEdge JV as an equity method investment.
- On June 1, 2021, Liberty Global and Telefónica, S.A. (**Telefónica**) completed a transaction (the **U.K. JV Transaction**) whereby (i) we contributed Virgin Media’s U.K. operations and certain other Liberty Global subsidiaries to a 50:50 joint venture (the **VMO2 JV**) and (ii) Telefónica contributed its U.K. mobile business to the VMO2 JV, creating a nationwide integrated communications provider. We account for our 50% interest in the VMO2 JV as an equity method investment.

Dispositions. Our significant dispositions include:

- On June 1, 2022, Telenet Group Holding N.V. (**Telenet**) completed the sale of substantially all of its passive infrastructure and tower assets to DigitalBridge Investments LLC (**DigitalBridge**) (the **Telenet Tower Sale**). As part of the Telenet Tower Sale, Telenet entered into a master lease agreement to lease back the passive infrastructure and tower assets from DigitalBridge for an initial period of 15 years (the **Telenet Tower Lease Agreement**). As part of the Telenet Tower Lease Agreement, Telenet has also committed to lease back 475 build-to-suit sites over the term of the lease. Telenet will act as an agent over the construction of future towers on the build-to-suit sites.
- On April 1, 2022, we completed the sale of our operations in Poland (**UPC Poland**) to a subsidiary of Iliad S.A. (**iliad**). In connection with the sale of UPC Poland, we agreed to provide certain transitional services to Iliad for a period of up to five years. These services principally comprise network and information technology-related functions.

Other Transactions

We continue to evaluate a change in jurisdiction of incorporation to Bermuda, which has U.S.-style corporate laws and lower administrative costs. To the extent we determine to move forward with any re-domicile transaction, we would seek shareholder approval in advance.

Equity Transactions

Share repurchases are an important part of our strategy in creating value for our shareholders. Pursuant to our most recent share repurchase program, our board of directors authorized us to repurchase ten percent of our outstanding shares (measured at the start of each year) during each of 2022 and 2023. Additionally, in July 2022, our board of directors authorized a further \$400.0 million for 2022 share repurchases. The following table provides the details of our share repurchases during 2022:

<u>Title of shares</u>	<u>Number of shares</u>	<u>Average price paid per share⁽¹⁾</u>	<u>Aggregate purchase price⁽¹⁾</u> <u>in millions</u>
Class A ordinary shares	3,856,700	\$ 21.55	\$ 83.1
Class C ordinary shares	69,381,968	\$ 23.34	1,619.5
			<u>\$ 1,702.6</u>

⁽¹⁾ Amounts include direct acquisition costs.

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

Forward Looking Statements

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

- economic and business conditions and industry trends in the countries in which we or our affiliates operate;
- the competitive environment in the industries and in the countries in which we or our affiliates operate, including competitor responses to our products and services;
- fluctuations in currency exchange rates and interest rates;
- instability in global financial markets, including sovereign debt issues and related fiscal reforms;
- consumer disposable income and spending levels, including the availability and amount of individual consumer debt, as a result of among other things, inflationary pressures;

- changes in consumer television viewing and mobile and broadband usage preferences and habits;
- consumer acceptance of our existing service offerings, including our broadband internet, television, fixed-line telephony, mobile and business service offerings, and of new technology, programming alternatives and other products and services that we may offer in the future;
- our ability to manage rapid technological changes and the rate at which our current technology becomes obsolete;
- our ability to maintain or increase the number of subscriptions to our broadband internet, television, fixed-line telephony and mobile service offerings and our average revenue per household;
- our ability to provide satisfactory customer service, including support for new and evolving products and services;
- our ability to maintain or increase rates to our subscribers or to pass through increased costs to our subscribers as a result of, among other things, inflationary pressures;
- the impact of our future financial performance, or market conditions generally, on the availability, terms and deployment of capital;
- changes in, or failure or inability to comply with, government regulations and legislation in the countries in which we or our affiliates operate and adverse outcomes from regulatory proceedings;
- government intervention that requires opening our broadband distribution networks to competitors, such as certain regulatory 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, monetary policies and government regulations that may impact the availability or cost of capital and the derivative instruments that hedge certain of our financial risks;
- our ability to navigate the potential impacts on our business resulting from the U.K.'s departure from the European Union (**E.U.**);
- the ability of suppliers and vendors (including our third-party wireless network provider, Three (Hutchison), under our mobile virtual network operator (**MVNO**) arrangement in Ireland) to timely deliver quality products, equipment, software, services and access;
- the availability of attractive programming for our video services and the costs associated with such programming, including production costs, retransmission and copyright fees payable to public and private broadcasters;
- uncertainties inherent in the development and integration of new business lines and business strategies;
- our ability to adequately forecast and plan future network requirements;
- the availability and cost of capital for the acquisition and/or development of telecommunications networks and services;
- the availability, cost and regulation of spectrum;
- problems we may discover post-closing with the operations, including the internal controls and financial reporting processes, of businesses we acquire;
- successfully integrating businesses or operations that we acquire or partner with on the timelines or within the budgets estimated for such integrations;
- operating costs, customer loss and business disruption, including maintaining relationships with employees, customers, suppliers or vendors, may be greater than expected in connection with our acquisitions and dispositions;
- our ability to realize the expected synergies from our acquisitions and joint ventures in the amounts anticipated or on the anticipated timelines;
- our ability to profit from investments, such as our joint ventures, that we do not solely control;

- our ability to protect against, mitigate and contain loss of our and our customers' data as a result of cyber attacks on us or any of our operating companies;
- the leakage of sensitive customer data;
- the outcome of any pending or threatened litigation;
- the loss of key employees and the availability of qualified personnel;
- changes in the nature of key strategic relationships with partners and joint venturers;
- our capital structure and factors related to our debt arrangements; and
- events that are outside of our control, such as political unrest in international markets, terrorist attacks, malicious human acts, natural disasters, epidemics, pandemics (such as COVID-19) and other similar events, including the ongoing invasion of Ukraine by Russia.

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" connectivity 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. We design our services to enable our customers to access the digital world on their own terms, with "best in class" connectivity 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, a combination thereof or mobile technology. We continually strive 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 through strategic acquisitions and partnerships and through product development to offer our customers a world-class suite of products and services. As part of this strategy, Telenet, the VMO2 JV, the VodafoneZiggo JV and Sunrise deliver mobile services as mobile network operators, and Virgin Media Ireland (**VM Ireland**) delivers mobile services as an MVNO through Three (Hutchison's) network.

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

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

As a trusted provider of telecommunications services for our customers, we strive to ensure the connections we make today are building for a sustainable future. Through our next-generation networks and products, digital innovations and a culture of belonging and well-being, we are purpose-driven to be a responsible, sustainable and inclusive company that offers opportunity for everyone – to connect to an exciting digital world. We work to ensure that we are continuously focused on the most significant sustainability impacts of our business – that while we create impact for our customers and the communities we serve, we are not creating negative impact for our planet. We are committed to becoming carbon neutral by 2030 for our Scope 1 and 2 emissions and are working across our entire business to build our full Scope 3 ambition. Our commitment to reduce GHG emissions includes purchasing electricity from renewable sources, transitioning our fleet to electric vehicles, improving the efficiency of our networks that will allow us to meet growing connectivity demands without increasing energy consumption, tackling e-waste by reducing the use of raw materials in our products, limiting our packaging and designing our products for longer lifespans and circularity. In addition, we are working with our partners and suppliers to ensure our entire value chain shares our focus on the urgency of the climate crisis. As a founding member of the European Green Digital Coalition, we champion our wider industry as a key player in the development of carbon-reducing digital solutions, to enable other sectors to also become more sustainable. Diversity and inclusion have long been priorities for Liberty Global and our operating companies, and they will become even more integral moving forward. Over the past several years, Liberty Global, VM Ireland,

Telenet, Sunrise, UPC Slovakia, the VMO2 JV and the VodafoneZiggo JV have all pursued gender diversity as a strategic goal, with an emphasis on building a gender-diverse pipeline of talent. 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 a more inviting workplaces regardless of age, race, gender, ethnicity, neuroability, religion, socioeconomic status, nationality or sexual orientation.

Operating Data

The following tables present certain operating data as of December 31, 2022, with respect to the networks of our subsidiaries and significant joint ventures. The following tables reflect 100% of the data applicable to each of our subsidiaries and significant joint ventures regardless of our ownership percentage.

	Homes Passed ⁽¹⁾	Fixed-Line Customer Relationships ⁽²⁾	Internet Subscribers ⁽³⁾	Video Subscribers ⁽⁴⁾	Telephony Subscribers ⁽⁵⁾	Total RGUs ⁽⁶⁾	Mobile Subscribers ⁽⁷⁾
Consolidated Liberty Global:							
Belgium	3,436,700	2,008,800	1,730,700	1,694,700	1,012,400	4,437,800	2,940,300
Switzerland ⁽⁶⁾	2,513,800	1,470,900	1,183,400	1,216,500	1,003,300	3,403,200	2,766,200
Ireland	965,000	421,100	382,600	260,700	252,200	895,500	143,800
Slovakia	637,900	182,400	146,400	164,900	89,400	400,700	—
Total	7,553,400	4,083,200	3,443,100	3,336,800	2,357,300	9,137,200	5,850,300
VMO2 JV	16,144,600	5,795,500	5,653,800			13,043,500	33,831,400
VodafoneZiggo JV ⁽⁹⁾	7,373,300	3,676,200	3,307,000	3,664,700	1,786,600	8,758,300	5,527,600

- (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 8 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) Internet Subscribers are homes, residential multiple dwelling units or commercial units that receive internet services over our networks, or that we service through a partner network. In Switzerland, we offer a 10 Mbps internet service to our Video Subscribers without an incremental recurring fee. Our Internet Subscribers in Switzerland include approximately 45,100 subscribers who have requested and received this service.
- (4) Video Subscribers are homes, residential multiple dwelling units or commercial units that receive our video services over our broadband network or through a partner network. We have approximately 30,100 "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.
- (5) Telephony Subscribers are homes, residential multiple dwelling units or commercial units that receive voice services over our networks, or that we service through a partner network. Telephony Subscribers exclude mobile telephony subscribers. In Switzerland, we offer a basic phone service to our Video Subscribers without an incremental recurring fee. Our Telephony Subscribers in Switzerland include approximately 188,500 subscribers who have requested and received this service.
- (6) An RGU is, separately, a Video Subscriber, Internet Subscriber or Telephony Subscriber. A home, residential multiple dwelling unit, or commercial unit may contain one or more RGUs. For example, if a residential customer subscribed to our video service, fixed-line telephony service and broadband internet service, the customer would constitute three RGUs. Total RGUs is the sum of Video, Internet and Telephony Subscribers. RGUs generally are counted on a unique premises basis such that a given premise does not count as more than one RGU for any given service. However, 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., certain preferred subscribers or free service to employees) generally

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

- (7) Our Mobile Subscriber count represents the number of active subscriber identification module (**SIM**) cards in service rather than services provided. For example, if a mobile subscriber has both a data and voice plan on a smartphone this would equate to one mobile subscriber. Alternatively, a subscriber who has a voice and data plan for a mobile handset and a data plan for a laptop would be counted as two mobile subscribers. Customers who do not pay a recurring monthly fee are excluded from our mobile subscriber count after periods of inactivity ranging from 30 to 90 days, based on industry standards within the respective country. In a number of countries, our mobile subscribers receive mobile services pursuant to prepaid contracts. As of December 31, 2022, our mobile subscriber count included approximately 440,000, 271,000, 7,968,300 and 370,700 prepaid Mobile Subscribers in Switzerland, Belgium, the VMO2 JV and the VodafoneZiggo JV, respectively. Prepaid mobile customers are excluded from the VMO2 JV's and the VodafoneZiggo JV's mobile subscriber counts after a period of inactivity of three months and nine months, respectively. The mobile subscriber count for the VMO2 JV includes internet of things (**IoT**) connections, which are Machine-to-Machine contract mobile connections, including Smart Metering contract connections. The mobile subscriber count for the VMO2 JV presented in the table above excludes mobile wholesale connections based on their definition.
- (8) Pursuant to service agreements, Switzerland offers broadband internet, video and telephony services over networks owned by third-party operators (**partner networks**), and following the acquisition of Sunrise, also service homes through Sunrise's existing agreements with Swisscom, Swiss Fibre Net and local utilities. Under these agreements, RGUs are only recognized if there is a direct billing relationship with the customer. Homes passed or serviceable through the above service agreements are not included in Switzerland's homes passed count as we do not own these networks. Including these arrangements, our operations in Switzerland have the ability to offer fixed services to the national footprint.
- (9) Amounts related to the VodafoneZiggo JV's fixed-line and mobile products include business and multiple dwelling unit subscribers.

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

Our Connect Box is a next generation Intelligent WiFi and telephony gateway that enables us to maximize the impact of our ultrafast broadband networks by providing reliable wireless connectivity anywhere in the home. This gateway can be self-installed and allows customers to customize their home WiFi service. Our latest versions of the gigabit Connect Box are based on DOCSIS 3.1 technology and WiFi 6, providing even better in-home WiFi service. Our new DOCSIS 3.1 Connect Box runs our "**One Firmware**" stack, a middleware software system based on the Reference Design Kit for Broadband (**RDK-B**). RDK-B is an open source initiative with wide participation from operators, device manufacturers and silicon vendors that standardizes core functions used in broadband devices, set-top boxes and IoT solutions. We have extended the One Firmware stack to support our ONE Connect ecosystem. One Firmware runs on system-on-a-chip (**SOC**) technology from multiple vendors and can run on any SOC that is RDK-B compliant, enabling greater speed and agility for on-boarding of new customer premises equipment (**CPE**) platforms and ecosystem features, allowing us to build once and port to many. During 2022, we continued the roll out of One Firmware to our legacy DOCSIS 3.0 WiFi 5GW and our next generation DOCSIS 3.1 WiFi 6 GW. In addition, we completed the porting activity of One Firmware to our new XGSPON and ethernet WiFi 6 gateways. To support the adoption of fiber-to-the-home, cabinet, building or node networks (fiber-to-the-home/-cabinet/-building/-node is referred to herein as **FTTx**) access in both on-net and off-net scenarios, we plan to add XGS-PON (an updated standard for passive optical networks that supports higher-speed, 10 Gbps symmetrical data transfers) and Ethernet-based Connect Boxes with WiFi 6, providing speeds up to 10 Gbps that run our One Firmware and support our ONE Connect ecosystem. Our Connect Box is available in all our markets, and during 2022, approximately 12 million of our customers have a Connect Box. In addition to our core markets, we distribute our Connect Box to other markets in Europe, Latin America and the Caribbean. Robust wireless connectivity is increasingly important with our customers spending more and more time using bandwidth-heavy services on multiple devices. We also offer our Connect App that, among other things, allows our customers to optimize their WiFi coverage and manage their connected devices. In addition, we provide Intelligent WiFi mesh boosters, which increase speed, reliability and coverage by adapting to the environment at home.

Internet speed is of crucial importance to our customers, as they spend more time streaming video and other bandwidth-heavy services on multiple devices. Our extensive broadband network enables us to deliver ultra-high-speed internet service across our markets. Our residential subscribers access the internet via cable modems connected to their internet capable devices, or wirelessly via a WiFi gateway device. We offer multiple tiers of broadband internet service up to gigabit speeds that is now available across our entire European footprint. The speed of service depends on the customer location and their service selected.

By leveraging our existing fiber-rich broadband networks, we are in a position to deliver gigabit services by deploying the next generation DOCSIS 3.1 technology. DOCSIS 3.1 technology is an international standard that defines the requirements for data transmission over a cable system. Not only does DOCSIS 3.1 technology improve our internet speeds and reliability, it allows for efficient network growth. Currently, our ultra-high-speed internet service is based primarily on DOCSIS 3.1 technology, and we offer this technology in all of our markets. As of the end of 2022, both the VMO2 JV's and the VodafoneZiggo JV's broadband networks were capable of offering every customer of the VMO2 JV and the VodafoneZiggo JV gigabit internet speeds.

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.

Mobile Services

Mobile services are another key building block for us to provide customers with seamless connectivity. Telenet, the VMO2 JV, the VodafoneZiggo JV and Sunrise offer mobile services as mobile network providers, and VM Ireland offers mobile services as an MVNO over a third-party network through Three (Hutchison).

Pursuant to VM Ireland's agreement with Three (Hutchison) to provide mobile services as an MVNO, Three (Hutchison) leases a third-party's radio access network and owns the core network, including switching, backbone and interconnections. VM Ireland's MVNO arrangement with Three (Hutchison) permits VM Ireland to offer its customers mobile services without needing to build and operate a cellular radio tower network.

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

Video Services

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

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

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

To meet customer demands, we have enhanced our video services with additional relevant content services and features, which increases viewing satisfaction and addresses individual user needs. Our latest next generation product suite is called "**Horizon 4**", a cloud-based, multi-screen entertainment platform that combines linear television (including recording and replay features), premium video-on-demand ("**VoD**") offerings, an increasing amount of integrated premium global and local video applications and mobile viewing into one entertainment experience. Horizon 4 comes with a state-of-the-art personal user interface that is intuitively easy to navigate. Content recommendations and favorite channel settings can be customized to individual user profiles. Video playback control, 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 and is capable of delivering 4K video content, including high dynamic range. The platform also features a 'Personal Home' page that automatically aggregates content, both linear and VoD, in a streamlined user interface, based on the user's viewing habits. It has achieved significant positive customer feedback, manifesting in high product net promoter score figures. Horizon 4 is marketed under the name "Telenet TV-Box" in Belgium, "Sunrise TV" in Switzerland,

“Virgin TV360” in the U.K., through the VMO2 JV, and Ireland and “MediaBox Next” in the Netherlands through the VodafoneZiggo JV.

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 a program 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 50% of the VMO2 JV’s customers have the Virgin Media V6 box. Similar to the hardware already deployed via the VodafoneZiggo JV, over time these V6 boxes will be flashed with the latest Horizon 4 software, bringing our latest and most successful television and entertainment experience to the VMO2 JV’s customers without the need to exchange the installed hardware. Approximately 25% of the VMO2 JV’s customers are on the Horizon 4 platform.

In the summer of 2020, we launched our first IP-only streaming device in our former Polish operations, which runs the full Horizon 4 product suite and features a small puck-like form factor that can be tucked away behind a TV screen. This all-IP mini 4K capable TV box has extremely low power consumption, and its casing is made from recycled plastic, proudly winning us the Digital TV Europe’s Video Tech Innovation Sustainability Award in December 2020 as well as the Red Dot Product Design Award in 2021. We have also launched this all-IP 4K capable TV box in Switzerland, the Netherlands and the U.K. We intend to continue rolling out this product to our other markets in the coming years.

Underpinned by this new IP-only streaming device, we launched our first subscription VoD-focused proposition in the U.K. called ‘Stream’. In addition to a slimmer channel lineup, this new package allows customers to pick and choose their favorite entertainment packages each month (e.g., Netflix, Disney+ and Prime Video) and get a 10% credit back for each subscription they add via our platform. By bundling their over the top (**OTT**) subscriptions together, customers also have an easy-to-see overview of what they are paying for and can manage them in a straightforward way, allowing for added flexibility as their viewing habits change.

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

In most of our markets, we offer transactional VoD giving subscribers access to thousands of movies and television series. In several of our markets, our subscription VoD service is included in certain of our video offerings. This service is tailored to the specific market based on available content, consumer preferences and competitive offers, and it 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, including, among others, Disney/Fox, NBC/Universal, CBS/Paramount, Warner Bros.-Discovery and Sony. In addition, in all of our markets we offer global premium OTT services such as Netflix, YouTube and Amazon Prime Video, and we also offer local OTT services via a large portion of our set-top boxes. These types of paid subscription services can be bundled into customers’ packages like in the Stream proposition or, in many cases, added directly to customers’ bills, offering them further convenience.

Most of this content is also available via our online mobile app, “**Horizon Go**”, which is available on mobile devices (iOS and Android) and, in some markets as well, via Amazon Fire TV, Apple TV and Android TV devices. Thanks to the 360 integration of Horizon 4 across multiple screens, customers can pause a program, series or movie and seamlessly continue watching from where they left off on another device, whether on 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.

Telephony Services

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

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

Multiple Dwelling Units and Partner Networks

In July of 2022, Telenet entered into an agreement with Fluvius System Operator CV (**Fluvius**) in which Telenet and Fluvius agreed to create a separate, self-funding infrastructure company in the Flanders region of Belgium (**NetCo**) that will operate the network infrastructure assets of both companies in the region. NetCo expects to further roll-out and operate a hybrid fiber coaxial (**HFC**) and fiber-to-the-home (**FTTH**) network within Telenet's current geographic footprint. Following the closing of this transaction, Telenet will become a wholesale access client of NetCo. This transaction is subject to regulatory approval by the European Commission, which is expected to be received mid-2023. Upon closing of the transaction with Fluvius, the long-term lease that Telenet currently has with Fluvius will terminate.

Pursuant to an agreement executed on June 28, 2008 (the **2008 PICs Agreement**) with four associations of municipalities in Belgium (the pure intercommunales or **PICs**), Telenet leases the PICs broadband communications network and, accordingly, makes its services available to all of the homes passed by the cable network owned by the PICs. Telenet has a direct customer relationship with the video subscribers on the PICs network. Pursuant to the 2008 PICs Agreement, Telenet has full rights to use substantially all of the PICs network under a long-term finance lease. Unless extended, the 2008 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 2008 PICs Agreement, see note 18 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

For over 70% of Sunrise's basic video subscribers, Sunrise 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, they then migrate to a direct billing relationship with us.

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

Business Services

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

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

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

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

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

Investments

VMO2 JV. Liberty Global owns 50% of the VMO2 JV, an integrated communications provider of broadband internet, video, fixed-line telephony, mobile and converged services to residential and business customers in the U.K. As part of the U.K. JV Transaction, Liberty Global entered into a shareholders agreement with Telefónica, that previously owned O2 in the U.K. (the **U.K. JV Shareholders Agreement**), which sets forth the corporate governance of the VMO2 JV, as well as, among other things, its dividend policy and non-competition provisions. The U.K. JV Shareholders Agreement mandates that the VMO2 JV distribute to Liberty Global and Telefónica on a quarterly basis a pro rata dividend equaling (unless agreed otherwise) all unrestricted cash, subject to certain minimum thresholds and financing arrangements. Subject to certain exceptions, Liberty Global may not transfer its ownership interest in the VMO2 JV without consent from Telefónica. Additional information on the U.K. JV Shareholders Agreement can be found in note 7 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

The VMO2 JV offers gigabit internet across its entire fixed network footprint, reaching over 16.1 million homes, combined with a mobile network that offers 99% indoor and outdoor population coverage on 4G, as well as 5G services in over 1,600 towns and cities across the U.K. The VMO2 JV had over 13 million RGUs as of December 31, 2022, comprised of approximately 5.7 million broadband internet subscribers. The VMO2 JV does not report video or telephony subscribers on an individualized basis, although such subscribers are included in its total RGU figure. In addition, the VMO2 JV had approximately 33.8 million mobile subscribers and is the U.K.'s leading mobile operator in terms of connections, with 44.7 million connections across its mobile, IoT and wholesale services.

In addition to gigabit broadband, the VMO2 JV provides fixed-line TV and telephony services. In 2022, the VMO2 JV launched a new flexible entertainment service called 'Stream,' which combines the customer's subscription packages such as Netflix, Disney+, and Amazon Prime, as well as the free TV channels under one system while also allowing the customer to transform their TV into a voice-activated unit. The VMO2 JV's TV customers continue to have access to the Horizon 4 minibox and its functionalities (marketed as 'Virgin TV 360'), including 'Catch up', 'Startover' and pause live TV, the Virgin TV Go app and VoD, along with access to a range of premium subscription-based and pay per view services.

The VMO2 JV provides a wide range of mobile telecommunications and associated value-added products and services, such as voice, messaging and data services, handsets and hardware (e.g., wearables and handsets), stand-alone mobile devices and other accessories.

The VMO2 JV's consumer convergence offering is led by its "**Volt**" proposition, offering new and existing customers that take Virgin Media broadband and eligible O2 Pay Monthly plans an upgrade to the next fixed broadband speed tier, increased mobile data and more value, including a wifi guarantee. As of December 31, 2022, Volt had surpassed 1.3 million customers, while fixed-mobile convergence penetration stood at approximately 45%.

The VMO2 JV also provides business and wholesale products and services to large enterprises, public sector entities and small and medium business customers as well as wholesale and MVNO partners.

nexfibre JV. We own a 25% interest in the nexfibre JV, a newly formed joint venture in the U.K. that intends to construct and operate a wholesale FTTH broadband network of 5-7 million premises that does not overlap with the VMO2 JV's existing network. Telefónica owns 25% of the nexfibre JV, and InfraVia owns the remaining 50%. The VMO2 JV will act as the anchor client for the new nexfibre JV's fiber network. The VMO2 JV also entered into a master services agreement with the nexfibre JV to provide access to the VMO2 JV's expertise in the telecommunications business. In combination with the VMO2 JV's existing network and planned FTTH upgrades, the VMO2 JV and the nexfibre JV networks are expected to expand gigabit coverage to approximately 80% of the U.K. once completed.

In connection with the formation of the nexfibre JV, we entered into shareholders agreements with Telefónica and InfraVia, providing for the governance of the nexfibre JV, including, among other things, its dividend policy and non-compete provisions. It also provides for restrictions on transfer of interests in the nexfibre JV and exit arrangements. Under the dividend policy, the nexfibre JV is required to distribute all unrestricted cash to Telefónica, InfraVia and us, subject to minimum cash requirements and financing arrangements.

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 Group plc (**Vodafone**) providing for the governance of the VodafoneZiggo JV, including, among other things, its dividend policy and non-compete provisions. It also provides for restrictions on the 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 approximately 7.4 million homes. In 2022 the VodafoneZiggo JV began offering gigabit internet speeds for residential and business customers across its entire footprint. The VodafoneZiggo JV also offers nationwide 4G and 5G mobile coverage. At December 31, 2022, the VodafoneZiggo JV had 8.8 million RGUs, of which 3.7 million were video, 3.3 million were broadband internet and 1.8 million were fixed-line telephony. In addition, the VodafoneZiggo JV had 5.5 million mobile customers. Besides its residential services, the VodafoneZiggo JV offers extensive business services throughout the Netherlands. The operations of the VodafoneZiggo JV are subject to various regulations, which are described below under *Regulatory Matters—Joint Venture Entities—The Netherlands*.

The VodafoneZiggo JV's customers continue to have access to the Horizon 4 minibox and its functionalities (marketed as "Ziggo TV"), including Replay TV, the Ziggo Go app, pause live TV and VoD, gigabit internet speeds and an extensive WiFi community network. The VodafoneZiggo JV also has its own sports channel, Ziggo Sport, and offers some exclusive programming. The VodafoneZiggo JV's customers also have access to Vodafone's nationwide 4G (referred to herein as **LTE**) and 5G wireless services, under either a prepaid or postpaid service plan. The VodafoneZiggo JV provides its mobile services under various licenses that have a weighted average useful life of approximately 18 years as of December 31, 2022. With its mobile services, the VodafoneZiggo JV is able to offer quad-play bundles and converged services to its residential and business customers.

Additional Business Information

Ventures

Liberty Global's investment arm, Liberty Global Ventures, has amassed a portfolio of investments in more than 75 companies across the world, investing in the fields of content, technology and infrastructure. With its long-term, founder-friendly mindset, Liberty Global Ventures makes meaningful investments in technologies that will change how people live and work tomorrow. Some of the companies in Liberty Global's portfolio include All3Media Ltd. (**All3Media**), Plume, ITV, Lions Gate Entertainment Corp. (**Lionsgate**), Televisa Univision, AtlasEdge, Formula E, Aviatrix Systems, Inc., Pax8 Inc., Lacework Inc. and EdgeConneX Inc., among others. When advantageous, we seek to forge commercial relationships between our operating companies and the companies we invest in, creating an even stronger partnership to help drive growth and efficiencies. The investments identified by company name above are intended to be merely illustrative, do not represent a complete list and are not necessarily the largest of our long-term investments. From time to time, we may make investments in other companies that we choose not to identify by company name for commercial, legal, strategic or other reasons.

Technology

Our broadband internet, video and fixed-line telephony services are primarily transmitted over an HFC 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 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 head-end 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 the Horizon 4 minibox and Virgin TV Go, as well as Horizon 4, and related products and developing and introducing online media sharing and streaming or cloud-based video; and
- testing new technologies.

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

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

In support of our connectivity strategy, we are moving our customers into a gigabit society. All of our broadband networks are already capable of supporting the next generation of ultra-high-speed internet service at gigabit speeds. To provide these speeds to our subscribers, we plan to grow our base of DOCSIS 3.1 technology throughout our footprint. The use of DOCSIS 3.1 technology provides us significantly higher efficiencies on our networks and allow us to offer faster speeds, in-home WiFi and better services. The new gateways and the continued upgrades to our network in the coming years will allow us to maximize high-speed connectivity over our broadband networks and deliver gigabit services in a cost-effective manner. It will also allow us to meet the expectations of our customers for high-speed internet access both in cities and rural areas of our footprint. While DOCSIS 3.1 technology will provide up to 2.5 Gbps, in 2023, we plan to deploy XGS-PON technology across our FTTH footprint, enabling speeds of up to 10 Gbps. In addition, we have started prototyping technology that is anticipated to equally provide 10 Gbps capabilities across our HFC footprint.

Supply Sources

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

- proposition (exceeding our customers’ entertainment desires and expectations);
- product (delivering the best content available);

- procurement (investment in the best brands, movies, shows and sports); and
- partnering (strategic alignment, acquisitions and growth opportunities).

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

In seeking licenses for content, we, including the VMO2 JV and the VodafoneZiggo JV, as applicable, partner with leading international and regional pay television providers, such as Disney, Sony, UKTV Paramount Global, AMC, NBCUniversal, RTL, BBC and Warner Bros. Discovery (including HBO). We also seek to carry in each of our markets key public and private broadcasters, and in some markets, we acquire local premium programming through select relationships with companies such as Sky plc (**Sky**), BT Group plc (**BT**), Warner Bros. Discovery and CANAL+ Polska S.A. For our VoD services, we license a variety of programming, including box sets of television series, movies, music, kids' programming and documentaries.

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

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, All3Media, Lionsgate, Virgin Media TV, SBS Belgium, Woestijnvis and Caviar Group. We are also investing in sports, both as a broadcaster and as a rights owner. We have our own sports channels, under the *Play Sports* brand in Belgium which is exclusively available to Telenet customers, and *MySports* in Switzerland, which Sunrise licenses to other platforms in Switzerland. In Ireland, Virgin Media customers have access to *VM More* which includes sports programming as well as first look products and premium content. In addition, the VodafoneZiggo JV owns *Ziggo Sport* and commissions the production of certain shows such as *Rondo* and *Race Cafe*. The basic *Ziggo Sport* service is available exclusively to the VodafoneZiggo JV's customers; however, the premium service is widely available through license arrangements.

In addition, we have commissioned our own drama series content. Through All3Media, 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, 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 Belgian 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 joint venture for subscription VoD with DPG Media.

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

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

For mobile services in Ireland provided through an MVNO arrangement with Three (Hutchison), we are dependent on third-party wireless network providers. Our MVNO operation in Ireland has an agreement with Three (Hutchison) to carry the mobile communications traffic of our customers. We seek to enter into medium to long-term arrangements for these services. A termination of this arrangements could significantly impact our MVNO-operated mobile services in Ireland.

Competition

All of our businesses operate in highly competitive and rapidly evolving markets. The speed of technological advancements is likely to continue to increase, giving customers more options for telecommunications services and products. Our customers want access to high quality telecommunication products that provide a seamless connectivity experience. Accordingly, our ability to offer converged services (video, internet and telephony through our, fixed and mobile networks) is a key component of our strategy. In many of our markets, we compete with incumbent companies that provide converged mobile and fixed-line services, as well as companies that are established in one or more communication products. Many of these companies have extensive resources allowing them to offer competitively priced converged services. Consequently, our businesses face significant competition. Our ability to offer high-quality and attractive triple-play or quad-play bundles and fixed-mobile convergence bundles in these markets 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, extensive content offers (for both in and out of the home) and our high-speed connectivity services backed by intelligent in-home WiFi solutions. In this section, we begin with an overview on the competitive nature of the broadband internet, video, mobile and telephony services in our markets, and then provide information on key competitors in our more material markets.

Internet

Our businesses face competition in a rapidly evolving broadband marketplace from both incumbent and non-incumbent telecommunications companies, mobile operators and other internet service providers, many of which have substantial resources. The internet services offered by these competitors include both fixed-line broadband internet via cable, digital subscriber lines (**DSL**) or FTTx and wireless broadband. These competitors have a range of product offerings with varying speeds and pricing, as well as interactive services, data and content services offered to households and businesses. With the demand for mobile internet services increasing, competition from wireless services using various advanced technologies is an important competitive factor. In all of our markets, competitors offer high-speed mobile data via 4G or 5G networks. In this intense competitive environment, internet speed and pricing are the key criteria for customers.

Our strategy is seamless speed leadership. Our focus is on increasing the maximum speed of our connections while providing a reliable customer experience and offering a variety of service tiers, prices, bundled products and a range of value-added services, including intelligent in-home connectivity solutions. We update our bundles and packages on an ongoing basis to meet the needs of our customers and to retain an attractive value-for-money ratio. Ultra-high download speeds of 1 Gbps are available throughout our operational footprints in each of the U.K., Belgium, the Netherlands, Switzerland and Ireland. We use our competitively priced ultra-high-speed internet services to encourage customers to switch to our services from other providers.

A notable competitive factor for us is overbuilding of our networks with FTTx technology by incumbent companies and other third parties. At the moment, we do not consider our networks to be critically overbuilt; however certain FTTx providers accelerated the rollout of their networks. We are confident that our hybrid fiber-coaxial networks can be upgraded to higher speeds, to match potential FTTx based products. Furthermore, whenever it makes operational and economic sense, we seek to capitalize on opportunities to grow our network capabilities through FTTx technology. This can be seen through the VMO2's previously-communicated plans to upgrade its entire U.K. fixed network to full FTTx, as well as the nexfibre JV's announced fiber project that will target building up to 7 million new FTTH homes in the coming years.

- **Telenet.** In the Flanders region of Belgium, Telenet is the leading provider of residential broadband internet services. Telenet's primary competitor is Proximus NV/SA (**Proximus**). Proximus is a well-established competitor offering quad-play bundles. Proximus' DSL and very high-speed DSL technology (**VDSL**) services provide download speeds up to 100 Mbps. Moreover, Proximus offers up to 1 Gbps speed via its fiber network that is available in selected cities

and is being actively deployed elsewhere in the country. 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 N.V. (**Orange Belgium**) currently offers its mobile subscribers a triple-play bundle including enhanced video, mobile and fixed broadband internet services. Furthermore, Orange Belgium is awaiting regulatory approval for its acquisition of VOO, a telecom operator that owns cable networks in the Wallonia region of Belgium. Telenet has signed an Memorandum of Understanding with Orange Belgium with respect to potentially gaining access to VOO's cable network in Wallonia. Furthermore, Telenet and Fluvius entered into an agreement to create NetCo, regulatory approval for which is expected in mid-2023.

- **Sunrise.** In Switzerland, Swisscom is the largest provider of broadband internet services, and is Sunrise's primary competitor. Swisscom offers download speeds ranging from 100 Mbps to up to 10 Gbps, depending on the region. Swisscom continues to expand its FTTx network to Switzerland households in our footprint, as well as in our partner network footprints. Salt, a predominantly mobile player, also competes in this arena, with a focus on fixed-mobile convergence through a combination of FTTx and fixed wireless access technologies offering 10 Gbps internet speeds. In this competitive market, Sunrise offers a fixed-mobile convergence portfolio called "Sunrise Up", enabling customers to benefit from the ultra-high-speed connectivity that is available across all of Sunrise's customer premises and offers significant fixed and mobile cross-selling opportunities. For more information on the Sunrise Acquisition, see note 5 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.
- **Significant Joint Ventures.**

In the U.K., the VMO2 JV faces numerous competitors for broadband internet services, the largest of which is BT. BT is actively building out its FTTx network through its subsidiary, Openreach, to support its goal of covering 25 million homes by the end of 2026. In support of this mission, BT offers a range of ultrafast consumer packages with speeds of up to 900 Mbps. As noted above, the VMO2 JV has reached 1 Gbps connectivity in all of its 16.1 million premises. Moreover, the VMO2 JV announced its intention to upgrade its fixed network to full fiber-to-the-premise by the end of 2028 and extend its FTTH footprint to up to 23 million premises through its partnership with the nexfibre JV. This plan is expected to fuel connectivity innovation for consumers and businesses, create options to potentially pursue the broadband wholesale market in the U.K. and to protect from growing FTTx competition.

The VodafoneZiggo JV's primary competitor, Koninklijke KPN N.V. (**KPN**), offers internet protocol television (**IPTV**) over its FTTx network and through broadband internet connections using DSL or VDSL. Where KPN has enhanced its VDSL system, it offers broadband internet with download speeds of up to 200 Mbps, and on its FTTx networks, it offers download speeds of up to 1 Gbps. Portions of the VodafoneZiggo JV's network have been overbuilt by KPN's and other providers' FTTx networks. In 2021, KPN and pension fund, APG, established a joint venture company called Glaspoort, that is targeting fiber rollouts in medium-dense, rural and industrial areas by connecting up to 1.2 million households and businesses by 2026. KPN will also continue to pursue its existing fiber roll-out plans in the coming years, with Glaspoort's scope expected to accelerate KPN's goal to reach approximately 80% FTTx coverage by 2026. We expect competitive pressure from the fiber overbuild to intensify in the coming periods. At the end of 2022, all of the VodafoneZiggo JV's 7.4 million households had access to ultra-fast 1 Gbps connectivity to support our competitive edge and speed advantage.

Video Distribution

Our video services compete primarily with traditional FTA broadcast television services, direct-to-home 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.

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

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

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

- Telenet. Telenet's principal competitor is Proximus, the incumbent telecommunications operator, which has interactive digital television, replay television, VoD, OTT and HD service as part of its video offer, as well as mobile-only video propositions tailored to the needs of younger market segments. Proximus offers customers a wide range of both individual and bundled services at competitive prices. Also, as a result of regulatory obligations, Telenet and other Belgian cable operators must give alternative providers access to their cable networks. 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, its Telenet TV offering and its additional features, such as HD and DVR functionality, VoD offerings, its *Play Sports* channel and original programming delivered via the Horizon 4 multimedia box. It is also using mobile services to drive its other products through its converged offerings. In addition, Telenet and DPG Media now offer a streaming platform called Streamz, which combines some of the best locally produced series and must-see international content from HBO, extensive kids' content, films and documentaries. Streamz is available for a monthly fee.

- Sunrise. 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 promotes its TV offering and a related family of products together with Replay TV and VoD, giving subscribers the ability to personalize their programming and viewing preferences while delivering an excellent user interface with voice control. Sunrise has its own sports channel, *My Sports* and aggregates third-party apps (e.g. Netflix, Amazon Prime Video, Sky Show, YouTube and others). Sunrise has expanded its video product offering to Yallo, its ancillary brand, an important step in moving Yallo to full telecommunications functionality. Yallo customers can access over 270 channels (many in Full HD and Dolby Digital), replay services and streaming apps such as Netflix, Disney+ and Amazon Prime which come pre-installed on the TV box. For more information on the Sunrise Acquisition, see note 5 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

- Significant Joint Ventures.

The VMO2 JV's principal competitors for digital television services are Sky and FTA television providers. Other significant competitors are BT and TalkTalk Telecom Group plc (**TalkTalk**), each of which offer triple-play services, IPTV video services and multimedia home gateways. Sky owns the U.K. rights to various entertainment, sports and movie programming. Sky is both a principal competitor and an important supplier of content to the VMO2 JV. Various Sky channels, including *Sky Sports*, are available over Sky's satellite system and our cable networks, as well as via Sky's apps and online players and other television platforms, and some of the channels are available on BT and TalkTalk platforms. The VMO2 JV distributes several basic and premium video channels supplied by Sky. BT is also both a principal competitor and an important supplier of content to the VMO2 JV. BT owns premium BT Sport channels, providing a range of sports content, including football (soccer) from the English Premier League and its exclusive rights to the UEFA Champions League and the UEFA Europa League. The BT Sport channels are available on the VMO2 JV's cable network as well as its competitors' networks. The VMO2 JV is expanding its broadband network and actively promoting its 4K and HDR ready boxes running on its Horizon 4 platform (marketed as "Virgin TV360") as well as its online streaming service, Virgin TV Go. Customers also have access to a new entertainment service, Stream, which is an all-in-one streaming TV box, combining TV channels and aggregating third-party subscription services such as Sky Sports, Netflix, and Disney+. Stream provides personalized viewing recommendations and allows customers to customize their subscription mix, billed through a single Virgin Media account.

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

Mobile and Telephony Services

In Belgium, as a mobile network operator (**MNO**), we are one of the larger mobile providers based on number of SIM cards. The same is true for the VodafoneZiggo JV in the Netherlands. We also substantially expanded our mobile business with the acquisition of Sunrise in Switzerland and through the joint venture with Telefónica's U.K. brand, O2, in the U.K. In the markets where we are an MNO, we continue to deploy additional bandwidth and look to acquire additional spectrum to deliver our wide range of services to our customers and expand our 4G and 5G services. Competition remains significant across each of our markets. We offer various calling plans, such as unlimited calling, national or international calling and use converged bundles and benefits to cross-sell mobile to our existing fixed customers. Our ability to offer fixed-mobile convergence services is a key driver of growth. Furthermore, in order to address lower segments of the market, we operate with ancillary mobile brands, such as Base (Belgium), Yellow (Switzerland) and Hollandsnieuwe (Netherlands).

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

In each of our markets, we face competition with a dominant fixed-line telephony provider, most of which also have competitive mobile offers based on 4G or 5G services. In our largest markets, the key dominant telephony providers are Proximus (Belgium) and Swisscom (Switzerland). These telephony competitors are also the largest mobile operators in these markets based on number of SIM cards. These competitors include their mobile products in bundles with fixed-line services. Moreover, there is a fundamental shift in customer preference towards mobile and OTT. As a result, we expect our fixed telephony user base to continue its decline in favor of mobile connectivity and OTT services.

Human Capital Resources

As of December 31, 2022, our consolidated subsidiaries had an aggregate of approximately 10,100 full-time equivalent employees, including approximately 3,660 in Belgium, 2,980 in Switzerland, 1,260 in the U.K., 940 in the Republic of Ireland, 870 in the Netherlands, 280 in Slovakia and 110 in the United States. With respect to our significant nonconsolidated joint ventures, the VMO2 JV employs approximately 16,350 people and the VodafoneZiggo JV employs approximately 6,170 people. None of the above figures include contractors or temporary employees.

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

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

We are committed to building a diverse, inclusive and equitable culture, where everyone belongs. We have been actively challenging our own behaviors and each other to create such culture. Being diverse, inclusive and equitable is important to our employees' experience and performance, talent acquisition and retention, and it brings us closer to the communities in which we live and operate. In 2022, we built upon our Diversity, Equity & Inclusion (**DE&I**) ambitions. We have continued to work with our DE&I Council, composed of our CEO and 19 executive representatives from around the company that meets regularly to discuss company strategies, initiatives and policies concerning DE&I. We have worked closely with our five Employee Resource Groups (**ERGs**) that focus on gender, race and ethnicity, multigenerational families, disability, neurodiversity and LGBTQIA+, ensuring that we are actively listening and co-creating. The VMO2 JV and VodafoneZiggo JV, along with Sunrise and VM Ireland, also have their own ERGs to provide support for their local employees and to complement Liberty Global's DE&I strategy and initiatives. In addition, our DE&I Council has worked diligently to prepare concrete, implementable initiatives to further our collective DE&I strategy. Such initiatives are measurable, allowing us to easily track our progress.

We also conduct compulsory anti-bullying, anti-discrimination and anti-harassment training for all of our employees in line with our Anti-Discrimination, Harassment and Bullying policy and engage in small-group, impactful conversations, centering on discrimination and harassment in the workplace. Our venture capital arm has committed \$10 million to investing in start-up companies, including through our partner, Avesta Capital, that make a positive impact on society. These companies, such as Blue Studios, Kiira Health, BoxPower, Harvest Thermal and Sunny Day Fund are specifically focused on socially conscious business practices, such as tackling economic and social inequity, as well as climate change. Liberty Global prides itself on the achievements it has made with respect to DE&I, but it recognizes that there is much work still to be done, and that to grow as a company we must invest in our people so that they can be themselves at work everyday.

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

At Liberty Global we are committed to the health and safety of our employees and visitors to our sites and we ensure compliance with all relevant national health and safety regulations. For employees, we currently utilize a hybrid work-from-home/work-from-office work program. We have also made available a series of well-being resources based on a four-pronged strategy focused on the mental, physical, social and financial aspects of health and well-being. Included in this strategy, among other things, is access to group training sessions, private work-out facilities, bicycle reimbursement plans, in-office flu vaccinations, and private check-up visits.

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

Additional information on our workforce and our commitment to our employees is made available in Liberty Global's Annual Corporate Responsibility Report, which we expect to be published on our website at the beginning of the third quarter of 2023.

Regulatory Matters

Overview

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

Of the six countries in our footprint, four are part of the E.U.: the Republic of Ireland, the Netherlands (nonconsolidated joint venture), Belgium and Slovakia. Our other operations are in the U.K. (nonconsolidated joint venture) and Switzerland are not in the E.U. but generally enact rules similar to that of the E.U.

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

In Switzerland, the distribution of radio and television is regulated under the Radio and Television Act. The provision of telecommunications services is regulated by the Telecommunications Act. In addition, the Competition Act, the Data Protection Act and the Act on the Surveillance of Post and Telecommunications are relevant to our business.

Sector Regulations

The European Electronic Communications Code (the **Code**) is the primary source of regulation governing our E.U. operations. The Code came into effect on December 20, 2018 and has been transposed by a majority of the Member States and the U.K. into their respective national laws. On April 6, 2022, the European Commission referred a number of Member States to the Court of Justice of the European Union for being late with the transposition, including Ireland. Ireland is in the process of adopting two legislative instruments that should give effect to the Code, the European Communities (Electronic Communications) Regulations 2022 and the Communications Regulation (Enforcement) Bill 2022. The U.K. has largely transposed the Code into its national laws. Switzerland, while not part of the E.U., has a regulatory system that partially reflects the principles of the E.U. The Telecommunications Act in Switzerland regulates, in general, the transmission of information, including the transmission of radio and television signals.

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

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

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

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

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

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

NRAs may, in some cases, impose access obligations on service providers, regardless of whether they have SMP. Under the Code and the E.U. Broadband Cost Reduction Directive, service providers may be required to provide access to certain elements of their passive network infrastructure upon reasonable request if there are significant economic or physical replicability barriers. Service providers may be required to provide access to their active infrastructure as well but only if a number of additional requirements are met. The U.K. has a similar system in place, while the Telecommunications Act in Switzerland requires operators with a dominant position to grant access to other providers on a non-discriminatory manner at cost-oriented prices.

Net Neutrality, Roaming and Call Termination

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

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

Call termination tariffs for SMP providers are set by NRAs, but for the E.U., the Code includes a system of single maximum, E.U.-wide voice termination rates for fixed and mobile. All fixed service providers are subject to a maximum fixed termination rate of €0.07 per minute, and by 2024 the single maximum rate for mobile termination will be €0.20 per minute. In the U.K., an SMP provider must provide termination on fair and reasonable terms, conditions and charges, which must be no higher than BT's regulated charges unless certain conditions are met. Switzerland does not follow the E.U. standard, however. Call termination rates in Switzerland are unregulated and commercially negotiated by operators. If an agreement cannot be found for fixed termination rates, the parties may initiate proceedings at the Communication Commission (ComCom), which then sets cost-oriented termination rates. Overall, termination rates in Switzerland are higher than the E.U. average. In each country in which we operate, we have been found to have SMP for call termination.

Broadcasting and Content Law

The Audiovisual Media Services Directive (**AVMSD**) governs the activities of broadcasters under E.U. law. The E.U. Member States that we operate in have fully transposed the AVMSD into their respective national laws.

Generally, broadcasts originating in and intended for reception within an E.U. Member State must respect the laws of that Member State. Pursuant to the AVMSD, however, E.U. Member States must allow broadcast signals of broadcasters established in another E.U. Member State to be freely transmitted within their territory, so long as the broadcaster complies with the law of their home state. In addition, when we offer third-party VoD services on our network, it is the third-party

provider, and not us as the distributor, that is regulated in respect of these services. The U.K. and Switzerland have regulatory systems that also reflect these principles.

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

To build upon the AVMSD, the European Commission published a proposal for the Media Freedom Act in September of 2022. It is not clear at this time when this proposed law would be adopted and become effective. The new law aims to help ensure media pluralism across the E.U., as well as ownership transparency requirements, especially with respect to foreign financing and the introduction of a review mechanism for concentrations of media companies. We expect that the Media Freedom Act will impact our business, however, until the final legislation is adopted, we will not know to what extent.

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 target audiences in their jurisdiction. Such obligations are applicable to (or are expected to become applicable to) certain of our businesses.

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

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

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

Technological Regulation

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

Pursuant to an E.U. regulation on standby power (the **Standby Regulation**), many devices are required to have either a low power standby mode or off mode, unless such mode is inappropriate for the intended use of the product. In particular, the Standby Regulation sets, among other things, the maximum power consumption of networked consumer equipment while in the so-called "Networked Standby" or "High Network Availability" modes. All of the devices we purchase and/or develop comply with the requirements of the Standby Regulation.

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

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

Through the E.U.'s Radio Spectrum Policy Program, certain spectrum has been approved for mobile broadband use. The terms under which this spectrum becomes available varies among the European countries in which we operate, and certain uses of this spectrum may interfere with services carried on our cable networks.

Privacy Regulation

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

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

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

On December 13, 2022, the European Commission adopted a draft adequacy decision for the E.U.-U.S. Data Privacy Framework, replacing the Privacy Shield deal which was struck down by the European Court of Justice in July 2020. U.S. companies will be able to join the E.U.-U.S. Data Privacy Framework by committing to comply with a detailed set of privacy obligations. E.U. citizens will also have access to a number of redress mechanisms in case their personal data is handled in violation of this framework, including an independent dispute resolution mechanism and a newly created ‘Data Protection Review Court’. The draft adequacy decision is now going through its adoption procedure and is expected to be finalized in the summer of 2023.

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

A continued flow of personal data from the EEA to Switzerland is ensured by the revised Swiss Data Protection Act (**DPA**), which is expected to come into force on September 1, 2023. The DPA ensures compatibility with E.U. law and provides for better protection of personal data, more transparency regarding the processing of data and a strengthening of the individual’s information rights (e.g., if such individual’s data is processed in a foreign country).

Other Regulations

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

With respect to cybersecurity, in 2016, the E.U. adopted a directive on security of network and information systems (**NIS Directive**), which provides legal measures to boost the overall level of cybersecurity in the E.U. Our operations in the E.U. do not fall under the NIS Directive, but a transposition of the Directive in Ireland, Slovakia and the Netherlands has effectively introduced the NIS Directive concepts into those jurisdictions. The successor to the NIS Directive, a directive on measures for a high common level of cybersecurity across the E.U. (**NIS 2 Directive**), was adopted by the E.U. legislature and published on December 14, 2022. Member States will have until October 18, 2024 to transpose the directive into their national legislation.

The E.U. and U.K. have announced restrictions related to so-called “high risk vendors” (**HRVs**) in the telecommunications sector. The E.U. published a “toolbox” of suggested measures for regulating 5G networks, acknowledging the need for a risk assessment of 5G equipment suppliers and the need to adopt mitigating measures by E.U. governments. Some Member States are addressing security concerns by identifying individual HRVs in advance, whose equipment should be excluded or limited for all network operations in the country. Switzerland has not yet adopted a policy position on the matter, but is studying the matter with a view to the potential adoption of measures in the future.

The U.K.'s recent Telecoms Security Act imposes a new security framework on telecommunication providers and gives the U.K. government new powers to, among other things, direct telecommunication providers to remove HRVs from their networks. Similar legislation has also been adopted in the Netherlands and Belgium.

The Digital Markets Act and the Digital Services Act were adopted in September and October 2022, respectively and will become effective in 2024. While the Digital Markets Act will have an immaterial impact on our business, under the Digital Services Act we will have additional obligations imposed on us, including with respect to periodic reporting, content moderation and the establishment of points of contact with national authorities and customers.

In February 2022, the European Commission introduced the Data Act, which would require companies to share personal and non-personal data generated by IoT products with users and third parties, upon the user's request. The Data Act also requires companies to share personal and non-personal data with public sector bodies in situations of exceptional need, and imposes switching and interoperability requirements on cloud services. Negotiations between the European Council and the European Parliament are still in process, and we cannot predict the ultimate outcome of these negotiations.

The Corporate Sustainability Reporting Directive (**CSRD**) came into force on January 5, 2023. The CSRD extends and strengthens the existing rules on non-financial reporting and aims to eventually have the same standards for both sustainability reporting and financial reporting. Companies will have to report on how sustainability issues affect their business, as well as the impact of their activities on people and the environment. The CSRD also aims to simplify the reporting process for companies, providing a single framework for providing information to investors and stakeholders. The first of the reporting requirements relevant to Liberty Global will apply in 2025 (for fiscal year 2024 reporting), with additional reporting requirements coming into effect on a staggered basis until 2029.

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

We often undergo close regulatory scrutiny from competition authorities, in particular with respect to proposed business combinations that often require clearance from the European Commission or national competition authorities, which can block, impose conditions on, or delay an acquisition, disposition or combination, thus possibly hampering our opportunities for growth. Additional scrutiny is also imposed under the national foreign direct investment screening regimes recently adopted by the U.K. and by some E.U. Member States. Such regimes which allow national governments to review and impose conditions on certain transactions involving critical infrastructures such as telecommunications. In the event conditions are imposed and we fail to meet them in a timely manner, the relevant authority or governments may impose fines and, if in connection with a transaction, may require restorative measures, such as a disposition of assets or divestiture of operations.

Belgium

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

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

Significant Joint Venture Entities

United Kingdom

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

Broadband Expansion. The U.K.'s Telecommunications Infrastructure (Leasehold Property) Act imposes building regulations that require new housing developments to have gigabit capable access. This new legislation comes as a result of the U.K. government's push to encourage greater investment in new digital infrastructure and deliver FTTH/gigabit capable networks to approximately 85% of U.K. premises by 2025.

Netherlands

From 2017 to 2021, the Netherlands' NRA, the Autoriteit Consument & Markt (**ACM**), conducted a market analysis of high-quality wholesale access. On November 18, 2021, the ACM submitted to the European Commission its intended decision to withdraw regulation of the high-quality business telecom services provided over KPN's network. On December 16, 2021, the European Commission indicated that it had no comments, resulting in the final decision of the ACM on December 23, 2021 to completely deregulate the high-quality wholesale access market in the Netherlands.

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. The SEC also maintains a website address at www.sec.gov that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC.

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 or our affiliates face and the technology used in our businesses;
- risks that relate to 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 digital terrestrial television (DTT) broadcasters, video provided via satellite platforms, networks using DSL, VDSL or vectoring technology, multi-channel multi-point 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, including for both retail and wholesale products and services, 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 local loop unbundling to provide these services, other facilities-based operators and wireless providers. Developments in DSL as well as investments into FTTx technology by the incumbent telecommunications operators and alternative providers have improved the attractiveness of our competitors' products and services and strengthened their competitive position. Developments in wireless technologies, such as 5G and FWA, are creating additional competitive challenges.

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

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

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

Our significant property and equipment additions may not generate a positive return. Significant additions to our property and equipment are, or in the future may be, required to add customers to our networks and to upgrade or expand our broadband communications networks and upgrade CPE to enhance our service offerings and improve the customer experience. Additions to our property and equipment, which are currently underway, require significant capital expenditures for equipment and associated labor costs to build out and/or upgrade our networks as well as for related CPE. 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 CPE.

No assurance can be given that any newbuilds, rebuilds, upgrades or extensions of our network will increase penetration rates, increase average monthly subscription revenue per average cable RGU or mobile subscriber, as applicable, or otherwise generate positive returns as anticipated, or that we will have adequate capital available to finance such newbuilds, rebuilds, upgrades or extensions. Additionally, costs related to our property and equipment additions could end up being greater than originally anticipated or planned. If this is the case, we may require additional financing sooner than anticipated, we may have to divert funding from other planned projects 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. In general, we do not produce our own content, and we depend on our agreements, relationships and cooperation with public and private broadcasters, rights holders and collective rights associations to obtain such content. If we fail to obtain a diverse array of popular programming for our pay television services, including a sufficient selection of HD channels as well as non-linear content (such as a selection of attractive VoD content) and rights for ancillary services such as DVR and catch up or 'Replay' services, on satisfactory terms, we may not be able to offer a compelling video product to our customers at a price they are willing to pay. Additionally, we are frequently negotiating and renegotiating programming agreements and our annual costs for programming can vary. There can be no assurance that we will be able to renegotiate or renew the terms of our programming agreements on acceptable terms or at all. There has also been a rise in the number of direct-to-consumer offerings from content owners which impacts negotiations and the content, rights available and restrictions imposed on us. Programming and copyright costs represent a significant portion of our operating costs and are subject to price rises 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, including as a result of inflationary pressures.

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

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

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

The continued interest in, and acquisition of, spectrum by existing carriers and others may reduce our ability to acquire, and increase the acquisition cost of, spectrum in the secondary market or negatively impact our ability to gain access to spectrum through other means, including government auctions. Our return on investment in spectrum depends on our ability to attract additional customers and to provide additional services and usage to existing customers. Additionally, applicable regulatory bodies may not be able to provide sufficient additional spectrum to auction. We may also be unable to secure the spectrum necessary to maintain or enhance our competitive position in auctions or in the secondary market, on favorable terms or at all.

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

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

Certain of our businesses that offer mobile telephony and data services rely on the radio access networks of third-party wireless network providers to carry our mobile communications traffic. Our services to mobile customers in Ireland rely on the use of an MVNO arrangement, currently with Three (Hutchison), whereby we utilize the radio access networks of a third-party wireless network provider to carry our mobile communications traffic. If our MVNO arrangement is terminated, or if Three (Hutchison) fails to provide the services required under our MVNO arrangement, or if it 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 arrangement comes to term, we may not be able to renegotiate renewal or replacement MVNO arrangement 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 (such as blackouts or brownouts), malicious human acts, security flaws and natural disaster or extreme weather events (including heatwaves, large storms and floods, whether or not arising from short-term or long-term changes in weather patterns). 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 local, 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 or revenue. While we maintain cyber liability insurance that provides both third-party liability and first-party liability insurance coverage, such insurance may not be sufficient to protect against all of our businesses' losses from any future disruptions or breaches of their systems or other events as described above. Also, a cybersecurity breach and the changing cybersecurity landscape could require us to devote significant management resources to address the problems associated with the breach and to expend significant additional resources to upgrade further the security measures we employ to protect customer, employee and other personal information against cyber-attacks and other wrongful attempts to access such information, which could result in a disruption of our operations. This includes additional infrastructure capacity spending to mitigate any system degradation and the reallocation of resources from development activities. To date, other than the non-permitted access of one of Virgin Media's databases in February of 2020, we have not been subject to cyberattacks or network disruptions that, individually or in the aggregate, have been material to our operations or financial condition. Although we have not detected another material security breach or cybersecurity incident to date, we have been the target of events of this nature and expect to be subject to similar attacks in the future.

We and our third-party vendors rely on the availability of raw materials used to produce our CPE. If the materials become scarce or our supply chains for obtaining such materials are disrupted, we might be forced to expend significant resources to obtain replacement materials or experience significant delays in delivering certain CPE to our customers, which could damage our reputation, credibility and business and have a negative impact on our revenue or margins.

Factors Relating to Operations and Regulation

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

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

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

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

convert unmatched debt into the applicable underlying currency. At December 31, 2022, substantially all of our debt was either directly or synthetically matched to the applicable functional currencies of the underlying operations.

We are also exposed to foreign currency exchange rate risk in respect of our cash and cash equivalents and in respect of investments held within separately managed accounts. A substantial portion of our cash and cash equivalents is held in U.S. dollars, but we hold balances in other currencies reflecting the operational and strategic needs of the company. The investments held in our separately managed accounts are generally in U.S. dollars, and any instruments denominated in a foreign currency are generally hedged back to the U.S. dollar.

In addition, we are exposed to foreign currency risk to the extent that we enter into transactions denominated in currencies other than our or our subsidiaries' respective functional currencies (non-functional currency risk), such as equipment purchases, programming contracts, notes payable and notes receivable (including intercompany amounts). Changes in exchange rates with respect to amounts recorded on our consolidated balance sheets related to these items will result in unrealized (based upon period-end exchange rates) or realized foreign currency transaction gains and losses upon settlement of the transactions. Moreover, to the extent that our revenue, costs and expenses are denominated in currencies other than our respective functional currencies, we will experience fluctuations in our revenue, costs and expenses solely as a result of changes in foreign currency exchange rates. Generally, we will consider hedging non-functional currency risks when the risks arise from agreements with third parties that involve the future payment or receipt of cash or other monetary items to the extent that we can reasonably predict the timing and amount of such payments or receipts and the payments or receipts are not otherwise hedged. In this regard, we have entered into foreign currency forward contracts to hedge certain of these risks. For additional information concerning our foreign currency forward contracts, see note 8 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

We are also exposed to unfavorable and potentially volatile fluctuations of the U.S. dollar (our reporting currency) against the currencies of our operating subsidiaries when their respective financial statements are translated into U.S. dollars for inclusion in our consolidated financial statements. Cumulative translation adjustments are recorded in accumulated other comprehensive earnings or loss as a separate component of equity. Any increase (decrease) in the value of the U.S. dollar against any foreign currency that is the functional currency of one of our operating subsidiaries will cause us to experience unrealized foreign currency translation losses (gains) with respect to amounts already invested in such foreign currencies. Accordingly, we may experience a negative impact on our comprehensive earnings or loss and equity with respect to our holdings solely as a result of foreign currency translation. Our primary exposure to foreign currency translation risk during the three months ended December 31, 2022 was to the euro and Swiss franc, as 55.1% and 43.6% of our reported revenue during the period was derived from subsidiaries whose functional currencies are the euro and Swiss franc, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for other local currencies in Europe. We do not hedge against the risk that we may incur non-cash losses upon the translation of the financial statements of our subsidiaries and affiliates into U.S. dollars.

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

Adverse changes in rules and regulations could:

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

- significantly and adversely impact our results of operations.

Businesses, including ours, that offer multiple services, such as video distribution as well as internet, telephony, and/or mobile services, or that are vertically integrated and offer both video distribution and programming content, often face close regulatory scrutiny from competition authorities. This is particularly the case with respect to any proposed business combinations, which often require clearance from the European Commission or national competition authorities, which can block, impose conditions on, or delay an acquisition, thus possibly hampering our opportunities for growth. Additional scrutiny is also imposed under the national foreign direct investment screening regimes recently adopted by the U.K. and some E.U. Member States, which allow national governments to review and impose conditions on certain transactions involving critical infrastructures such as telecommunications. In the event conditions are imposed and we fail to meet them in a timely manner, the relevant authority or governments may impose fines and, if in connection with a transaction, may require restorative measures, such as a disposition of assets or divestiture of operations.

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

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

If any laws, regulations or rules are enacted or reinterpreted so as to expand the regulation of our products and services or our disclosure obligations, they could affect our operations or require significant expenditures. For example, certain of our business operations will become subject to corporate responsibility reporting obligations pursuant to the CSRD in the coming years. We cannot predict future developments in these areas, and any changes to the regulatory framework for our products and services or our disclosure obligations could have a negative impact on our business and results of operations.

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

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

We cannot be certain that we will be successful with respect to acquisitions, dispositions, joint ventures, partnerships or other similar transactions, or that we will achieve the anticipated benefits thereof. Historically, our businesses have grown, in part, through selective acquisitions that enabled them to take advantage of existing networks, local service offerings and region-

specific management expertise, and we have also taken advantage of attractive opportunities to sell select businesses and partner with others. We expect to seek to continue improving our company through attractive acquisitions, dispositions, joint ventures, partnerships or other similar transactions in selected markets, such as the Sunrise Acquisition in November 2020, the sale of UPC Poland in April 2022 and the Telenet Tower Sale in June 2022, as well as the formations of the VMO2 JV in June 2021, the AtlasEdge JV in September 2021 and the nexfibre JV in December 2022. Our ability to complete any transaction may be limited by many factors, including government regulation, availability of financing, our or our counterparty's debt covenants, the prevalence of complex ownership structures among potential targets, acquirers, joint ventures or partners, disapproval by shareholders of potential targets or acquirers, and competition from other potential acquirers, including private equity funds. Even if we are successful in completing such transactions, integration and separation activities may present significant costs and challenges. We cannot be assured that we will be successful with respect to acquisitions, dispositions, joint ventures, partnerships or other similar transactions or realizing the anticipated benefits thereof.

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

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

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

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

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

- diversion of management attention to integration matters;
- difficulties in integrating operations and systems, including intellectual property and communications systems, administrative and information technology infrastructure, and supplier and vendor arrangements, including as a result of the COVID-19 pandemic;
- challenges in conforming standards, controls, procedures and accounting and other policies;
- alignment of key performance measurements may result in a greater need to communicate and manage clear expectations while we work to integrate and align policies and practices;
- difficulties in integrating employees;

- the transition of management to the combined company management team, and the need to address possible differences in corporate cultures, management philosophies, and compensation structures;
- challenges in retaining existing customers and obtaining new customers;
- compliance with government regulations
- known or potential unknown liabilities of the acquired businesses that are larger than expected; and
- other potential adverse consequences and unforeseen increased expenses or liabilities associated with the applicable transaction.

Additionally, uncertainties over the integration process could cause customers, suppliers, distributors, dealers, retailers and others to seek to change or cancel our existing business relationships or to refuse to renew existing relationships. Suppliers, distributors and content and application providers may also delay or cease developing new products for us that are necessary for the operations of our business due to uncertainties or lack of available resources. Competitors may also target our existing customers by highlighting potential uncertainties and integration difficulties.

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

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

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

We may have exposure to additional tax liabilities. We are subject to income taxes as well as non-income based taxes, such as value-added tax (**VAT**) in the U.K., the U.S. and many other jurisdictions around the world. In addition, most tax jurisdictions that we operate in have complex and subjective rules regarding the valuation of intercompany services, cross-border payments between affiliated companies and the related effects on income tax, VAT and transfer tax. Significant judgment is required in determining our worldwide provision for income taxes and other tax liabilities. In the ordinary course of our business, there are many transactions and calculations where the ultimate tax determination is uncertain. We are regularly under audit by tax authorities in many of the jurisdictions in which we operate. These audits may lead to disputes with tax

authorities which may result in litigation. Although we believe that our tax estimates are reasonable, any material differences as a result of final determinations of tax audits or tax disputes could have an adverse effect on our financial position and results of operations in the period or periods for which such determination is made.

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

Further changes in the tax laws of the foreign jurisdictions in which we operate could arise as a result of the Base Erosion and Profit Shifting (BEPS) project undertaken by the Organizational Economic Cooperation and Development (OECD). The OECD represents a coalition of member countries that encompass most of the jurisdictions in which we operate. In October 2021, the OECD announced the OECD/G20 Inclusive Framework of Base Erosion and Profit Shifting, which agreed to a two-pillar solution to reform international taxation. Pillar One provides a mechanism to align taxing rights more closely with local market engagement; generally, where people or consumers are located. Pillar Two establishes a global minimum tax regime through a series of interlocking rules that would apply when a country's income tax rate is below 15%. In most jurisdictions in which we operate, it is anticipated that the Pillar Two rules will be enacted by the end of 2023 with the income inclusion rule applying to accounting periods beginning on or after December 31, 2023 and the undertaxed profits rule taking effect for years beginning from December 31, 2024. It is possible that jurisdictions in which we do business could react to the BEPS initiatives or their own concerns by enacting tax legislation that could adversely affect our financial position through increasing our tax liabilities. Further, the BEPS project as well as legislative changes in many countries, has resulted in various initiatives that require the sharing of company financial and operation information with taxing authorities on a local or global basis. This may lead to greater audit scrutiny of profits earned in other countries as well as disagreements between jurisdictions associated with the proper allocation of profits between jurisdictions.

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

Factors Relating to Certain Financial Matters

Our substantial leverage could limit our ability to obtain additional financing and have other adverse effects. We seek to maintain our debt at levels that provide for attractive equity returns without assuming undue risk. In this regard, we generally seek to cause our operating subsidiaries to maintain their debt at levels that result in a consolidated debt balance that is between four and five times our consolidated Adjusted EBITDA (using consistent currency exchange rates for debt and EBITDA). As a result, we are highly leveraged. At December 31, 2022, the outstanding principal amount of our consolidated debt, together with our finance lease obligations aggregated \$13.8 billion, including \$0.8 billion that is classified as current on our consolidated balance sheet and \$12.7 billion that is not due until 2028 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 redeemed certain debt instruments using proceeds from the sale of UPC Polska, and targeted such redemptions at instruments with shorter maturities. As a result of unfavorable

geopolitical conditions in 2022, credit markets were not offering attractive terms for issuance and thus we did not complete any refinancing transactions on our consolidated businesses. 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 a share repurchase program for Liberty Global in 2022. Any cash used by our company in connection with any future repurchases of our ordinary shares would not be available for other purposes, including the repayment of debt. For additional information concerning our share repurchase programs, see note 14 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

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

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

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

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

In addition, most of the credit agreements to which these subsidiaries are parties include financial covenants that require them, in certain circumstances, to maintain certain leverage ratios if the drawings under the applicable revolving credit facility exceed a certain percentage of the commitments under such revolving credit facility. Their ability to meet these financial covenants may be affected by adverse economic, competitive, or regulatory developments and other events beyond their control, and we cannot assure you that these financial covenants will be met. In the event of a default under such subsidiaries'

credit agreements or indentures, the lenders or bondholders, as applicable, may accelerate the maturity of the indebtedness under those agreements or indentures, which could result in a default under other outstanding credit facilities or indentures. We cannot assure you that any of these subsidiaries will have sufficient assets to repay indebtedness outstanding under their credit agreements and indentures. Any refinancing of this indebtedness is likely to contain similar restrictive covenants.

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

In July 2017, the U.K. Financial Conduct Authority (the authority that regulates LIBOR) announced that it intends to stop compelling banks to submit rates for the calculation of LIBOR after 2021. Additionally, the European Money Markets Institute (the authority that administers EURIBOR) announced that measures would need to be undertaken by the end of 2021 to reform EURIBOR to ensure compliance with the E.U. Benchmarks Regulation. In November 2020, ICE Benchmark Administration (the entity that administers LIBOR) announced its intention to continue publishing USD LIBOR rates until June 30, 2023, with the exception of the one-week and two-month rates which, along with all CHF and GBP LIBOR rates, it ceased to publish after December 31, 2021. Furthermore, in November 2022, the U.K. Financial Conduct Authority proposed that certain tenors of USD LIBOR would continue to be published on a synthetic basis until the end of September 2024. While this extension allows additional runway on existing contracts using USD LIBOR rates, companies are still encouraged to transition away from using USD LIBOR as soon as practicable and should not enter into new contracts that use USD LIBOR after 2021. The methodology for EURIBOR has been reformed and EURIBOR has been granted regulatory approval to continue to be used. Currently, there is no consensus amongst loan borrowers and investors for what rate(s) should replace USD LIBOR.

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

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

Continuing uncertainties and challenging conditions in the global economy and in the countries in which we operate may adversely impact our business, financial condition and results of operations. The current macroeconomic environment is highly volatile, with continued instability in global markets, including ongoing trade negotiations, uncertainty over inflation, energy price fluctuations, continued escalation in geopolitical tensions and global recession fears having all contributed to a

challenging global economic environment. Future developments are dependent upon a number of political and economic factors, including the additional borrowing incurred by countries during the COVID-19 pandemic and the potential for lower growth expectations, higher global interest rates and continued inflationary pressures. 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, including the current cost-of-living crises in many of the countries in which we operate, 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 (i) more difficult for us to attract new subscribers and maintain current subscribers, (ii) more likely that subscribers will downgrade or disconnect their services and (iii) 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 and our joint ventures. Accordingly, our ability to increase, or, in certain cases, maintain, the revenue, ARPUs, RGUs, mobile subscribers, Adjusted EBITDA, margins and liquidity of our operating segments could be adversely affected if the macroeconomic environment remains uncertain or declines further. We are currently unable to predict the extent of any of these potential adverse effects.

We are exposed to sovereign debt and currency instability risks that could have an adverse impact on our liquidity, financial condition and cash flows. Our operations are subject to macroeconomic and political risks that are outside of our control. For example, high levels of sovereign debt in the U.S. and several countries in which we or our affiliates operate, combined with structural changes arising from the COVID-19 pandemic, could potentially lead to additional fiscal reforms (including austerity measures), tax increases, sovereign debt restructurings, high corporate default rates, currency instability, increased counterparty credit risk, high levels of volatility and disruptions in the credit and equity markets, as well as other outcomes that might adversely impact our company. With regard to currency instability issues, concerns exist in the Eurozone with respect to individual macro-fundamentals on a country-by-country basis, as well as with respect to the overall stability of the European monetary union and the suitability of a single currency to appropriately deal with specific fiscal management and sovereign debt issues in individual Eurozone countries. The realization of these concerns could lead to the exit of one or more countries from the European monetary union and the re-introduction of individual currencies in these countries, or, in more extreme circumstances, the possible dissolution of the European monetary union entirely, which could result in the redenomination of a portion or, in the extreme case, all of our Euro-denominated assets, liabilities and cash flows to the new currency of the country in which they originated. This could result in a mismatch in the currencies of our assets, liabilities and cash flows. Any such mismatch, together with the capital market disruption that would likely accompany any such redenomination event, could have a material adverse impact on our liquidity and financial condition. Furthermore, any redenomination event would likely be accompanied by significant economic dislocation, particularly within the eurozone countries, which in turn could have an adverse impact on demand for our products and services, and accordingly, on our revenue and cash flows. Moreover, any changes from Euro to non-Euro currencies within the countries in which we operate would require us to modify our billing and other financial systems. No assurance can be given that any required modifications could be made within a time frame that would allow us to timely bill our customers or prepare and file required financial reports. In light of the significant exposure that we have to the Euro through our Euro-denominated borrowings, derivative instruments, cash balances and cash flows, a redenomination event could have a material adverse impact on our company.

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

We are exposed to the risk of default by the counterparties to our cash and short-term investments, derivative and other financial instruments, and undrawn debt facilities. Although we seek to manage the credit risks associated with our cash and short-term investments, derivative and other financial instruments, and undrawn debt facilities, we are exposed to the risk that

our counterparties will default on their obligations to us. While we regularly review our credit exposures and currently have no specific concerns about the creditworthiness of any counterparty for which we have material credit risk exposures, we cannot rule out the possibility that one or more of our counterparties could fail or otherwise be unable to meet its obligations to us. Any such instance of default or failure could have an adverse effect on our cash flows, results of operations, financial condition and/or liquidity. In this regard, (i) 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, (ii) 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, (iii) our derivative liabilities may be accelerated by the default of our counterparty, (iv) 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, (v) amounts available under committed credit facilities may be reduced and (vi) disruption to the credit markets could adversely impact our ability to access debt financing on favorable terms, or at all.

At December 31, 2022, our exposure to counterparty credit risk included (i) cash and cash equivalent and restricted cash balances of \$1.7 billion, (ii) aggregate undrawn debt facilities of \$1.5 billion and (iii) derivative assets with an aggregate fair value of \$0.9 billion. For additional information regarding our derivative contracts and debt, see notes 8 and 11, respectively, to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

We may not report net earnings. We reported earnings (loss) from continuing operations of \$1,105.3 million, \$13,527.5 million and (\$1,525.1 million) during 2022, 2021 and 2020, 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 consistently or at all on any class of our ordinary shares. We do not presently intend to pay cash dividends on any class of our ordinary shares for the foreseeable future. However, we have the right to pay dividends, effect securities distributions or make bonus issues on Liberty Global shares. In addition, any dividends or distributions on, or repurchases of Liberty Global shares will reduce our “Distributable Reserves” (defined as our accumulated, realized profits less accumulated, realized losses, as measured for U.K. statutory purposes) legally available to be paid as dividends by our company under English law on any of our ordinary shares.

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

John C. Malone has significant voting power with respect to corporate matters considered by our shareholders. John C. Malone beneficially owns outstanding ordinary shares of Liberty Global representing 30.65% of our aggregate voting power as of February 13, 2023. 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 30.65% of our aggregate voting power and 67.63% 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 share class that entitles the holders to 10 votes per share; a Class A share class that entitles the holders to one vote per share; and a Class C share class that, except as otherwise required by applicable law, entitles the holders to no voting rights;

- authorizing the issuance of “blank check” shares (both ordinary and preference), which could be issued by our board of directors to increase the number of outstanding shares and thwart a takeover attempt;
- classifying our board of directors with staggered three-year terms, which may lengthen the time required to gain control of our board of directors, although under English law, shareholders of our company can remove a director without cause by ordinary resolution;
- prohibiting shareholder action by written resolution, thereby requiring all shareholder actions to be taken at a meeting of the shareholders;
- requiring the approval of 75% in value of the shareholders (or class of shareholders) and/or English court approval for certain statutory mergers or schemes of arrangements; and
- establishing advance notice requirements for nominations of candidates for election to our board of directors or for proposing matters that can be acted upon by shareholders at shareholder meetings.

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

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

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

Geopolitical conflicts, energy shortages and other adverse incidents beyond our control could adversely affect our revenue and results of operations. Political unrest and global conflicts like the ongoing conflict between Russia and Ukraine have disrupted, and in the future may further continue to disrupt, global supply chains and heighten volatility and disruption of global financial markets. While we do not have direct operations within Russia or Ukraine, the conflict involving these nations has heightened the disruption to our supply chain, triggered inflation in our labor and energy costs and may increase our risk of cyberattacks, which could result in significant losses and damage and could damage our reputation with customers and suppliers if their confidential information is compromised. The impact of these global events on our longer-term operational and financial performance will depend on future developments, our and governmental responses to inflation, and the duration and severity of the conflict in Ukraine. Any terrorist attacks or incidents prompted by political unrest, particularly in markets that we serve, and the national and global military, diplomatic and financial response to such attacks or other threats, also may adversely affect our revenue and results of operations.

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, head-end facilities, rights of way, cable television and telecommunications distribution equipment, telecommunications switches, base stations, cell towers, CPE and other property necessary for their operations. The physical components of their broadband networks require maintenance and periodic upgrades to support the new services and products they introduce. Subject to these maintenance and upgrade activities, our management believes that our current facilities are suitable and adequate for our business operations for the foreseeable future.

Item 3. LEGAL PROCEEDINGS

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

Item 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

General

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

Market Information

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

The following table sets forth the quarterly range of high and low sales prices of Liberty Global Class B ordinary shares for 2022 and 2021. 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
2022		
First quarter	\$ 30.30	\$ 23.55
Second quarter	\$ 26.20	\$ 21.39
Third quarter	\$ 23.59	\$ 16.62
Fourth quarter	\$ 20.99	\$ 16.30
2021		
First quarter	\$ 36.11	\$ 22.58
Second quarter	\$ 38.89	\$ 25.00
Third quarter	\$ 31.00	\$ 26.15
Fourth quarter	\$ 30.85	\$ 26.76

Holders

As of January 31, 2023, there were 1,225, five and 1,390 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, 2022:

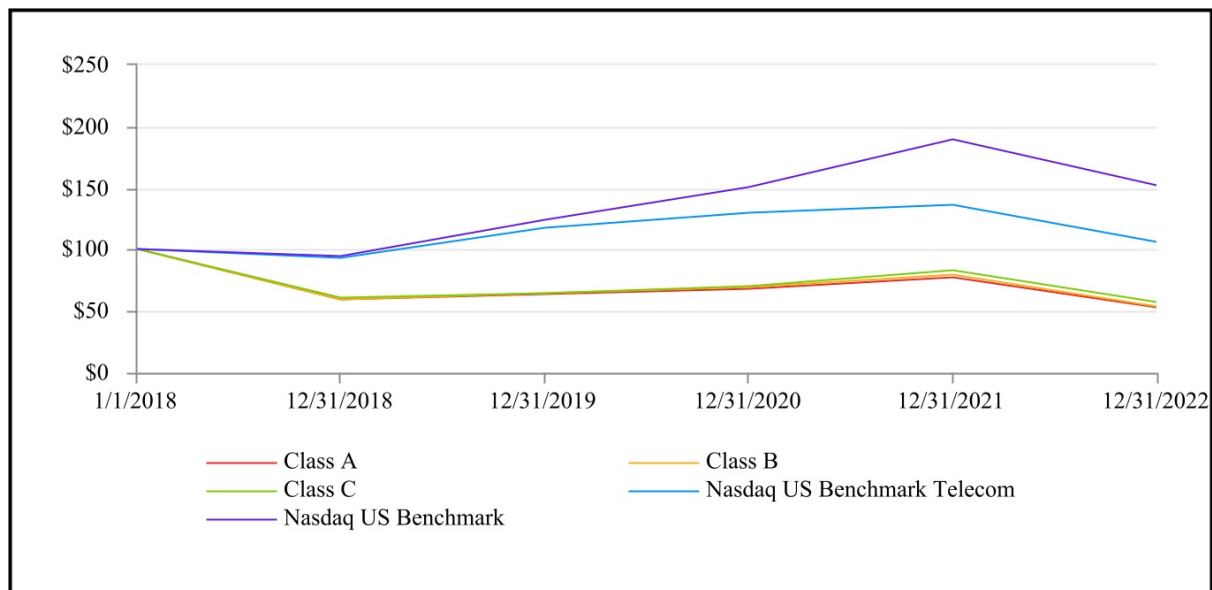
Period	Total number of shares purchased	Average price paid per share (a)	Total number of shares purchased as part of publicly-announced plans or programs	Value of shares that may yet be repurchased under the plans or programs
October 1, 2022 through October 31, 2022:				
Class A	—	—	—	(b)
Class C	6,634,155	17.38	6,634,155	(b)
November 1, 2022 through November 30, 2022:				
Class A	—	—	—	(b)
Class C	—	—	—	(b)
December 1, 2022 through December 31, 2022:				
Class A	—	—	—	(b)
Class C	—	—	—	(b)
Total — October 1, 2022 through December 31, 2022:				
Class A	—	—	—	(b)
Class C	6,634,155	17.38	6,634,155	(b)

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

(b) Under our current repurchase program that was approved in July 2021, we are authorized during 2023 to repurchase 10% of our total outstanding shares as of the beginning of the year, or approximately 45.9 million shares. Based on the respective closing share prices as of December 30, 2022, this would equate to total share repurchases of approximately \$0.9 billion. However, the actual U.S. dollar amount of our share repurchases during 2023 will be determined by the actual transaction date share prices during the year and could differ significantly from this amount.

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, 2018 to December 31, 2022, to the change in the cumulative total returns of the Nasdaq US Benchmark Telecom TR Index and the Nasdaq US Benchmark TR Index (assuming reinvestment of dividends, where applicable). The graph assumes that \$100 was invested on January 1, 2018.



	December 31,				
	2018	2019	2020	2021	2022
Liberty Global - Class A	\$ 59.54	\$ 63.45	\$ 67.58	\$ 77.40	\$ 52.82
Liberty Global - Class B	\$ 59.07	\$ 63.97	\$ 68.97	\$ 79.21	\$ 53.45
Liberty Global - Class C	\$ 60.99	\$ 64.42	\$ 69.89	\$ 83.01	\$ 57.42
Nasdaq US Benchmark Telecom TR Index	\$ 93.18	\$ 117.75	\$ 129.33	\$ 136.23	\$ 105.87
Nasdaq US Benchmark TR Index	\$ 94.56	\$ 124.03	\$ 150.41	\$ 189.36	\$ 152.00

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, 2022 and 2021.
- *Liquidity and Capital Resources.* This section provides an analysis of our corporate and subsidiary liquidity and consolidated statements of cash flows.
- *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.

Included below is an analysis of our results of operations and cash flows for 2022, as compared to 2021. An analysis of our results of operations and cash flows for 2021, as compared to 2020, 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, 2021 (our **2021 10-K**), which is available through the Securities and Exchange Commission's website at www.sec.gov.

Unless otherwise indicated, convenience translations into U.S. dollars are calculated, and operational data is presented, as of December 31, 2022.

Overview

General

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

Through March 31, 2022, we provided residential and B2B communications services in Poland through UPC Holding. On April 1, 2022, we completed the sale of our operations in Poland. Accordingly, our operations in Poland are reflected 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. For additional information regarding the sale of UPC Poland, including with respect to our use of proceeds, see note 6 to our consolidated financial statements.

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

Operations

Our company delivers market-leading products through next-generation networks that connect our customers to broadband internet, video, fixed-line telephony and mobile services. At December 31, 2022, our continuing operations owned and operated networks that passed 7,553,400 homes and served 4,083,200 fixed-line customers and 5,850,300 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, Televisa Univision, Lacework, Plume, the AtlasEdge JV, All3Media, EdgeConneX, Lionsgate, the Formula E racing series and several regional sports networks. The investments identified by company name above are intended to be merely illustrative, do not represent a complete list and are not necessarily the largest of our long-term investments. From time to time, we may make investments in other companies that we choose not to identify by company name for commercial, legal, strategic or other reasons.

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, video, fixed-line telephony and mobile services with existing customers through product bundling and upselling.

Impact of COVID-19

The global COVID-19 pandemic continues to impact the economies of the countries in which we operate. However, during 2022, the impact on our company continued to be relatively minimal as demand for our products and services remained strong. It is not currently possible to estimate the duration and severity of the COVID-19 pandemic or the adverse economic impact resulting from the preventative measures taken to contain or mitigate its outbreak, therefore no assurance can be given that an extended period of global economic disruption would not have a material adverse impact on our business, financial condition and results of operations in future periods.

Competition and Other External Factors

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

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

Results of Operations

We have completed a number of transactions that impact the comparability of our 2022 and 2021 results of operations, the most notable of which are (i) the U.K. JV Transaction on June 1, 2021, (ii) the sale of UPC Poland on April 1, 2022 and (iii) the Telenet Tower Sale on June 1, 2022. For further information regarding our acquisitions and dispositions, see notes 5 and 6, respectively, to our consolidated financial statements.

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

Changes in foreign currency exchange rates have a significant impact on our reported operating results as all of our operating segments have functional currencies other than the U.S. dollar. Our primary exposure to FX risk during the three months ended December 31, 2022 was to the euro and Swiss franc, as 55.1% and 43.6% of our reported revenue during the period was derived from subsidiaries whose functional currencies are the euro and Swiss franc, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for certain other local currencies in Europe. The portions of the changes in the various components of our results of operations that are attributable to changes in FX are highlighted under *Discussion and Analysis of our Reportable Segments* and *Discussion and Analysis of our Consolidated Operating Results* below. For information regarding our foreign currency risks and the applicable foreign currency exchange rates in effect for the periods covered by this Annual Report on Form 10-K, see *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

The amounts presented and discussed below represent 100% of each of our consolidated reportable segment's results of operations. As we have the ability to control Telenet, we consolidate 100% of its revenue and expenses in our consolidated statements of operations despite the fact that third parties own a significant interest. The noncontrolling owners' interests in the operating results of Telenet and other less significant majority-owned subsidiaries are reflected in net earnings or loss attributable to noncontrolling interests in our consolidated statements of operations. Similarly, despite only holding a 50% noncontrolling interest in both the VMO2 JV and the VodafoneZiggo JV, we present 100% of the revenue and Adjusted EBITDA of those entities in the tables below.

Discussion and Analysis of our Reportable Segments

General

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

The tables presented below in this section provide the details of the revenue and Adjusted EBITDA of our reportable segments for 2022, as compared to 2021. 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) with respect to our consolidated reportable segments, 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 reportable segments for 2022 and 2021 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 reportable segments. Any cost increases that we are not able to pass on to our subscribers through rate increases would result in increased pressure on our operating margins. For additional information regarding our foreign currency exchange risks see *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

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

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

	Year ended December 31,		
	2022	2021	2020
	in millions		
Earnings (loss) from continuing operations	\$ 1,105.3	\$ 13,527.5	\$ (1,525.1)
Income tax expense (benefit)	318.9	473.3	(275.9)
Other income, net	(134.4)	(44.9)	(76.2)
Gain on AtlasEdge JV Transactions	—	(227.5)	—
Gain on U.K. JV Transaction	—	(10,873.8)	—
Gain on Telenet Tower Sale	(700.5)	—	—
Share of results of affiliates, net	1,267.8	175.4	245.3
Losses (gains) on debt extinguishment, net	(2.8)	90.6	233.2
Realized and unrealized losses (gains) due to changes in fair values of certain investments, net	302.1	(735.0)	(45.2)
Foreign currency transaction losses (gains), net	(1,407.2)	(1,324.5)	1,409.3
Realized and unrealized losses (gains) on derivative instruments, net	(1,191.7)	(622.9)	878.7
Interest expense	589.3	882.1	1,186.8
Operating income	146.8	1,320.3	2,030.9
Impairment, restructuring and other operating items, net	85.1	(19.0)	97.4
Depreciation and amortization	2,171.4	2,353.7	2,227.2
Share-based compensation expense	192.1	308.1	348.0
Adjusted EBITDA	<u>\$ 2,595.4</u>	<u>\$ 3,963.1</u>	<u>\$ 4,703.5</u>

Revenue of our Reportable Segments

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

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

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2022	2021	\$	%	\$	%
in millions, except percentages						
Switzerland	\$ 3,180.9	\$ 3,321.9	\$ (141.0)	(4.2)	\$ (0.5)	—
Belgium	2,807.3	3,065.9	(258.6)	(8.4)	49.2	1.6
U.K. (a)	—	2,736.4	(2,736.4)	(100.0)	—	—
Ireland	494.7	550.0	(55.3)	(10.1)	5.6	1.0
Central and Other	722.4	648.7	73.7	11.4	70.0	10.8
Intersegment eliminations	(9.6)	(11.6)	2.0	N.M.	2.0	N.M.
Total	\$ 7,195.7	\$ 10,311.3	\$ (3,115.6)	(30.2)	\$ 126.3	1.7
VMO2 JV (b)	\$ 12,857.2	\$ 8,522.9	\$ 4,334.3	50.9		
VodafoneZiggo JV	\$ 4,284.6	\$ 4,824.2	\$ (539.6)	(11.2)		

N.M. — Not Meaningful.

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

(b) The 2021 amount represents the revenue of the VMO2 JV for the period beginning June 1, 2021.

Switzerland. The details of the decrease in Switzerland's revenue during 2022, as compared to 2021, are set forth below:

	Subscription revenue	Non- subscription revenue	Total
	in millions		
Decrease in residential fixed subscription revenue due to change in:			
Average number of customers	\$ (5.8)	\$ —	\$ (5.8)
ARPU	(42.3)	—	(42.3)
Decrease in residential fixed non-subscription revenue (a)	—	(13.3)	(13.3)
Total decrease in residential fixed revenue	(48.1)	(13.3)	(61.4)
Increase in residential mobile revenue (b)	29.4	19.1	48.5
Increase in B2B revenue (c)	3.4	15.2	18.6
Decrease in other revenue	—	(6.2)	(6.2)
Total organic increase (decrease)	(15.3)	14.8	(0.5)
Impact of FX	(101.3)	(39.2)	(140.5)
Total	\$ (116.6)	\$ (24.4)	\$ (141.0)

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

Belgium. The details of the decrease in Belgium's revenue during 2022, as compared to 2021, are set forth below:

	Subscription revenue	Non- subscription revenue	Total
	in millions		
Increase (decrease) in residential fixed subscription revenue due to change in:			
Average number of customers	\$ (16.0)	\$ —	\$ (16.0)
ARPU	3.9	—	3.9
Decrease in residential fixed non-subscription revenue	—	(4.2)	(4.2)
Total decrease in residential fixed revenue	(12.1)	(4.2)	(16.3)
Increase (decrease) in residential mobile revenue (a)	30.5	(41.7)	(11.2)
Increase in B2B revenue (b)	14.2	53.1	67.3
Increase in other revenue	—	9.4	9.4
Total organic increase	32.6	16.6	49.2
Impact of acquisitions	—	39.8	39.8
Impact of dispositions	—	(0.8)	(0.8)
Impact of FX	(254.9)	(91.9)	(346.8)
Total	<u>\$ (222.3)</u>	<u>\$ (36.3)</u>	<u>\$ (258.6)</u>

- (a) The increase in residential mobile subscription revenue is primarily due to higher ARPU. The decrease in residential mobile non-subscription revenue is primarily attributable to lower interconnect revenue.
- (b) The increase in B2B subscription revenue is primarily attributable to an increase in ARPU. The increase in B2B non-subscription revenue is largely due to higher revenue from wholesale services and an increase in interconnect revenue.

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

Ireland. The details of the decrease in Ireland's revenue during 2022, as compared to 2021, are set forth below:

	Subscription revenue	Non- subscription revenue	Total
	in millions		
Increase (decrease) in residential fixed subscription revenue due to change in:			
Average number of customers	\$ (8.1)	\$ —	\$ (8.1)
ARPU	6.2	—	6.2
Decrease in residential fixed non-subscription revenue	—	(0.6)	(0.6)
Total decrease in residential fixed revenue	(1.9)	(0.6)	(2.5)
Increase in residential mobile revenue	3.7	1.1	4.8
Increase in B2B revenue	1.1	1.1	2.2
Increase in other revenue	—	1.1	1.1
Total organic increase	2.9	2.7	5.6
Impact of FX	(44.7)	(16.2)	(60.9)
Total	<u>\$ (41.8)</u>	<u>\$ (13.5)</u>	<u>\$ (55.3)</u>

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 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 table sets forth the Adjusted EBITDA of our reportable segments.

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2022	2021	\$	%	\$	%
in millions, except percentages						
Switzerland	\$ 1,137.8	\$ 1,208.7	\$ (70.9)	(5.9)	\$ (3.0)	(0.3)
Belgium	1,308.1	1,481.8	(173.7)	(11.7)	14.7	1.0
U.K. (a)	—	1,085.3	(1,085.3)	(100.0)	—	—
Ireland	197.5	218.6	(21.1)	(9.7)	3.2	1.5
Central and Other	(47.0)	(33.1)	(13.9)	(42.0)	(64.3)	N.M.
Intersegment eliminations	(1.0)	1.8	(2.8)	N.M.	(2.8)	N.M.
Total	\$ 2,595.4	\$ 3,963.1	\$ (1,367.7)	(34.5)	\$ (52.2)	(1.8)
VMO2 JV (b)	\$ 4,562.2	\$ 2,716.6	\$ 1,845.6	67.9		
VodafoneZiggo JV	\$ 2,018.0	\$ 2,265.6	\$ (247.6)	(10.9)		

N.M. — Not Meaningful.

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

(b) The 2021 amount represents Adjusted EBITDA of the VMO2 JV for the period beginning June 1, 2021.

Adjusted EBITDA Margin

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

	Year ended December 31,	
	2022	2021
Switzerland	35.7 %	36.4 %
Belgium	46.6 %	48.3 %
Ireland	39.9 %	39.7 %
VMO2 JV	35.5 %	31.9 %
VodafoneZiggo JV	47.1 %	47.0 %

In addition to organic changes in the revenue, operating and SG&A expenses of our reportable segments, the Adjusted EBITDA margins presented above include the impact of acquisitions, as applicable. 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. For discussion of the factors contributing to the changes in the Adjusted EBITDA margins of the VMO2 JV and the VodafoneZiggo JV, see Discussion and Analysis of our Consolidated Operating Results — Share of results of affiliates, net below.

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.

Revenue

Our revenue by major category is set forth below:

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2022	2021	\$	%	\$	%
in millions, except percentages						
Residential revenue:						
Residential fixed revenue (a):						
Subscription revenue (b):						
Broadband internet	\$ 1,378.2	\$ 2,371.7	\$ (993.5)	(41.9)	\$ 39.2	2.7
Video	1,077.4	1,831.8	(754.4)	(41.2)	(55.9)	(4.5)
Fixed-line telephony	381.4	841.1	(459.7)	(54.7)	(43.7)	(9.5)
Total subscription revenue	2,837.0	5,044.6	(2,207.6)	(43.8)	(60.4)	(1.9)
Non-subscription revenue	94.5	161.2	(66.7)	(41.4)	(18.0)	(15.1)
Total residential fixed revenue	2,931.5	5,205.8	(2,274.3)	(43.7)	(78.4)	(2.4)
Residential mobile revenue (c):						
Subscription revenue (b)	1,401.4	1,630.7	(229.3)	(14.1)	63.6	4.4
Non-subscription revenue	543.7	760.8	(217.1)	(28.5)	(21.1)	(3.5)
Total residential mobile revenue	1,945.1	2,391.5	(446.4)	(18.7)	42.5	2.1
Total residential revenue	4,876.6	7,597.3	(2,720.7)	(35.8)	(35.9)	(0.7)
B2B revenue (d):						
Subscription revenue	515.1	619.0	(103.9)	(16.8)	18.6	3.4
Non-subscription revenue	861.7	1,243.8	(382.1)	(30.7)	68.6	7.9
Total B2B revenue	1,376.8	1,862.8	(486.0)	(26.1)	87.2	6.2
Other revenue (e)						
Total	\$ 7,195.7	\$ 10,311.3	\$ (3,115.6)	(30.2)	\$ 126.3	1.7

- (a) Residential fixed subscription revenue includes amounts received from subscribers for ongoing services and the recognition of deferred installation revenue over the associated contract period. Residential fixed non-subscription revenue includes, among other items, channel carriage fees, late fees and revenue from the sale of equipment.
- (b) Residential subscription revenue from subscribers who purchase bundled services at a discounted rate is generally allocated proportionally to each service based on the standalone price for each individual service. As a result, changes in the standalone pricing of our fixed and mobile products or the composition of bundles can contribute to changes in our product revenue categories from period to period.
- (c) Residential mobile subscription revenue includes amounts received from subscribers for ongoing services. Residential mobile non-subscription revenue includes, among other items, interconnect revenue and revenue from sales of mobile handsets and other devices. Residential mobile interconnect revenue was \$140.0 million and \$232.6 million during 2022 and 2021, respectively.

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

Total revenue. Our consolidated revenue decreased \$3,115.6 million or 30.2% during 2022, as compared to 2021. This decrease includes a decrease of \$2,736.4 million attributable to the impact of the U.K. JV Transaction. On an organic basis, our consolidated revenue increased \$126.3 million or 1.7%.

Residential revenue. The details of the decrease in our consolidated residential revenue during 2022, as compared to 2021, are as follows (in millions):

Decrease in residential fixed subscription revenue due to change in:	
Average number of customers	\$ (32.0)
ARPU	(28.4)
Decrease in residential fixed non-subscription revenue	(18.0)
Total decrease in residential fixed revenue	(78.4)
Increase in residential mobile subscription revenue	63.6
Decrease in residential mobile non-subscription revenue	(21.1)
Total decrease in residential revenue	(35.9)
Impact of acquisitions and dispositions	(2,287.4)
Impact of FX	(397.4)
Total decrease in residential revenue	\$ (2,720.7)

On an organic basis, our consolidated residential fixed subscription revenue decreased \$60.4 million or 1.9% during 2022, as compared to 2021, primarily attributable to a decrease in Switzerland.

On an organic basis, our consolidated residential fixed non-subscription revenue decreased \$18.0 million or 15.1% during 2022, as compared to 2021, primarily due to a decrease in Switzerland.

On an organic basis, our consolidated residential mobile subscription revenue increased \$63.6 million or 4.4% during 2022, as compared to 2021, primarily attributable to increases in Belgium and Switzerland.

On an organic basis, our consolidated residential mobile non-subscription revenue decreased \$21.1 million or 3.5% during 2022, as compared to 2021, primarily due to a decrease in Belgium, partially offset by an increase in Switzerland.

B2B revenue. On an organic basis, our consolidated B2B subscription revenue increased \$18.6 million or 3.4% during 2022, as compared to 2021, primarily due to an increase in Belgium.

On an organic basis, our consolidated B2B non-subscription revenue increased \$68.6 million or 7.9% during 2022, as compared to 2021, primarily attributable to increases in Belgium and Switzerland.

Other revenue. On an organic basis, our consolidated other revenue increased \$75.0 million or 8.4% during 2022, as compared to 2021, primarily attributable to an increase in Central and Other due to the net effect of (i) an increase in revenue earned from the sale of CPE to the VodafoneZiggo JV and (ii) a decrease in revenue earned from the NL JV Services.

Programming and other direct costs of services

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

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

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2022	2021	\$	%	\$	%
in millions, except percentages						
Switzerland	\$ 1,020.1	\$ 1,063.2	\$ (43.1)	(4.1)	\$ 2.0	0.2
Belgium	657.9	706.8	(48.9)	(6.9)	(2.4)	(0.3)
U.K. (a)	—	868.1	(868.1)	(100.0)	—	—
Ireland	134.2	157.7	(23.5)	(14.9)	(7.1)	(4.5)
Central and Other	276.3	226.1	50.2	22.2	66.0	29.2
Intersegment eliminations	(2.8)	(4.3)	1.5	N.M.	1.5	N.M.
Total	\$ 2,085.7	\$ 3,017.6	\$ (931.9)	(30.9)	\$ 60.0	2.7

N.M. — Not Meaningful.

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

Our programming and other direct costs of services decreased \$931.9 million or 30.9% during 2022, as compared to 2021. This decrease includes a decrease of \$868.1 million attributable to the impact of the U.K. JV Transaction. On an organic basis, our programming and other direct costs of services increased \$60.0 million or 2.7%. This increase is primarily due to the net effect of the following factors:

- An increase in costs of \$65.8 million in Central and Other related to the sale of CPE to the VodafoneZiggo JV;
- A decrease in programming and copyright costs of \$22.3 million or 3.7%, attributable to lower costs for certain premium and/or basic content, primarily in Ireland and Switzerland;
- A decrease in interconnect and access costs of \$22.3 million or 2.8%, primarily due to the net effect of (i) lower interconnect and mobile roaming costs in Switzerland and Belgium, (ii) higher leased tower costs in Switzerland and (iii) lower MVNO costs in Switzerland;
- An increase in mobile handset and other device costs of \$21.9 million or 6.7%, largely due to higher sales volumes in Switzerland; and
- An increase of \$8.1 million associated with the impact of the classification of costs in connection with the U.K. JV Services provided by Central and Other, which, subsequent to the completion of the U.K. JV Transaction, are classified as direct costs of services. This increase was fully offset by a corresponding decrease in various SG&A expense categories within Central and Other.

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)	
	2022	2021	\$	%	\$	%
in millions, except percentages						
Switzerland	\$ 422.3	\$ 405.1	\$ 17.2	4.2	\$ 36.4	9.0
Belgium	434.4	451.6	(17.2)	(3.8)	10.4	2.2
U.K. (a)	—	405.9	(405.9)	(100.0)	—	—
Ireland	90.0	94.5	(4.5)	(4.8)	6.7	7.1
Central and Other	139.2	115.1	24.1	20.9	33.6	29.2
Intersegment eliminations	(2.6)	(1.3)	(1.3)	N.M.	(1.3)	N.M.
Total other operating expenses excluding share-based compensation expense	1,083.3	1,470.9	(387.6)	(26.4)	\$ 85.8	7.9
Share-based compensation expense	4.9	13.7	(8.8)	(64.2)		
Total	\$ 1,088.2	\$ 1,484.6	\$ (396.4)	(26.7)		

N.M. — Not Meaningful.

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

Our other operating expenses (exclusive of share-based compensation expense) decreased \$387.6 million or 26.4% during 2022, as compared to 2021. This decrease includes a decrease of \$405.9 million attributable to the impact of the U.K. JV Transaction. On an organic basis, our other operating expenses increased \$85.8 million or 7.9%. This increase is primarily due to the following factors:

- An increase in business service costs of \$42.4 million or 32.5%, primarily due to (i) an increase in energy costs, primarily in Belgium, and (ii) higher consulting costs, primarily in Central and Other;
- An increase in bad debt expense of \$17.6 million or 82.3%, primarily in Switzerland. This increase includes \$4.5 million recognized in Switzerland associated with the sale of certain handset receivables, for which the proceeds of CHF 110.3 million (\$113.7 million at the applicable rate) were received on July 1, 2022. The expense recognized during the second quarter of 2022 represents the difference between the carrying amount of the associated receivables and the amount received pursuant to the sale; and
- An increase in core network and information technology-related costs of \$14.2 million or 5.7%, primarily due to (i) higher network maintenance costs, primarily due to an increase in Central and Other that was only partially offset by a decrease in Switzerland, and (ii) higher information technology-related expenses in Ireland, Central and Other and Belgium.

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)	
	2022	2021	\$	%	\$	%
in millions, except percentages						
Switzerland	\$ 600.7	\$ 644.9	\$ (44.2)	(6.9)	\$ (35.9)	(5.4)
Belgium	406.9	425.7	(18.8)	(4.4)	26.5	6.2
U.K. (a)	—	377.1	(377.1)	(100.0)	—	—
Ireland	73.0	79.2	(6.2)	(7.8)	2.8	3.6
Central and Other	353.9	340.6	13.3	3.9	34.7	10.2
Intersegment eliminations	(3.2)	(7.8)	4.6	N.M.	4.6	N.M.
Total SG&A expenses excluding share-based compensation expense	1,431.3	1,859.7	(428.4)	(23.0)	\$ 32.7	2.2
Share-based compensation expense	187.2	294.4	(107.2)	(36.4)		
Total	\$ 1,618.5	\$ 2,154.1	\$ (535.6)	(24.9)		

N.M. — Not Meaningful.

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

Supplemental SG&A expense information

	Year ended December 31,		Decrease		Organic increase	
	2022	2021	\$	%	\$	%
in millions, except percentages						
General and administrative (a)	\$ 1,102.9	\$ 1,443.6	\$ (340.7)	(23.6)	\$ 17.9	1.5
External sales and marketing	328.4	416.1	(87.7)	(21.1)	14.8	4.4
Total	\$ 1,431.3	\$ 1,859.7	\$ (428.4)	(23.0)	\$ 32.7	2.2

(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) decreased \$428.4 million or 23.0% during 2022, as compared to 2021. This decrease includes a decrease of \$377.1 million attributable to the impact of the U.K. JV Transaction. On an organic basis, our SG&A expenses increased \$32.7 million or 2.2%. This increase is primarily due to the following factors:

- An increase in business service costs of \$27.2 million or 15.7%, primarily due to higher (i) travel and entertainment costs in Central and Other, (ii) energy costs in Central and Other and Belgium, (iii) facility management costs in Belgium and Central and Other and (iv) consulting costs, as a decrease in Switzerland was more than offset by increases in Belgium and Central and Other; and

- An increase in external sales and marketing costs of \$14.8 million or 4.4%, primarily due to higher costs associated with advertising campaigns in Switzerland.

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,	
	2022	2021
	in millions	
Liberty Global:		
Non-performance based incentive awards (a)	\$ 133.5	\$ 168.6
Performance-based incentive awards (b)	7.1	59.6
Other (c)	30.8	33.6
Total Liberty Global	171.4	261.8
Telenet share-based incentive awards (d)	10.9	35.1
Other	9.8	11.2
Total	\$ 192.1	\$ 308.1
Included in:		
Other operating expenses	\$ 4.9	\$ 13.7
Total SG&A expenses	187.2	294.4
Total	\$ 192.1	\$ 308.1

- (a) In April 2021, with respect to 2014 and 2015 grants, the compensation committee of our board of directors approved the extension dates of outstanding SARs and director options from a seven-year term to a ten-year term. Accordingly, the Black-Scholes fair values of the respective outstanding awards increased, resulting in the recognition of an aggregate incremental share-based compensation expense of \$22.7 million during 2021.
- (b) Includes share-based compensation expense related to (i) our 2019 Challenge Performance Awards and (ii) in the 2021 period, PSUs and our 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. In addition, amounts include compensation expense related to the 2022 and 2021 Ventures Incentive Plans.
- (d) Represents the share-based compensation expense associated with Telenet's share-based incentive awards, which, at December 31, 2022, included performance- and non-performance-based stock option awards with respect to 3,519,920 Telenet shares. These stock option awards had a weighted average exercise price of €31.43 (\$33.66).

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 \$2,171.4 million and \$2,353.7 million during 2022 and 2021, respectively. Excluding the effects of FX, depreciation and amortization expense decreased \$6.3 million or 0.3% during 2022, as compared to 2021. This decrease is primarily due to the net effect of (i) a decrease associated with certain assets becoming fully depreciated, primarily in Central and Other, Switzerland and Belgium and (ii) an increase associated with property and equipment additions related to the installation of CPE, the expansion and upgrade of our networks and other capital initiatives, primarily in Central and Other, Switzerland and Belgium.

Impairment, restructuring and other operating items, net

We recognized impairment, restructuring and other operating items, net, of \$85.1 million during 2022, as compared to (\$19.0 million) during 2021.

The 2022 amount primarily includes (i) a \$39.6 million provision in Central and Other related to a legal contingency, (ii) abandoned lease expense of \$20.2 million, primarily in Switzerland, and (iii) direct acquisition and disposition costs of \$19.4 million, primarily in Belgium.

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

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

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

Interest expense

We recognized interest expense of \$589.3 million and \$882.1 million during 2022 and 2021, respectively. Excluding the effects of FX, interest expense decreased \$220.4 million or 25.0% during 2022, as compared to 2021. This decrease is primarily attributable to a lower average outstanding debt balance, largely due to the impact of the U.K. JV Transaction. For additional information regarding our outstanding indebtedness, see note 11 to our consolidated financial statements.

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

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

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

	Year ended December 31,	
	2022	2021
	in millions	
Cross-currency and interest rate derivative contracts (a)	\$ 1,185.5	\$ 578.9
Foreign currency forward and option contracts	28.3	(31.8)
Equity-related derivative instruments:		
ITV Collar	—	(11.8)
Other	(21.4)	85.6
Total equity-related derivative instruments (b)	(21.4)	73.8
Other	(0.7)	2.0
Total	<u>\$ 1,191.7</u>	<u>\$ 622.9</u>

(a) The gains during 2022 and 2021 are attributable to net gains associated with changes in (i) certain market interest rates and (ii) the relative value of certain currencies. In addition, the gains during 2022 and 2021 include net losses of \$16.6 million and \$10.7 million, respectively, 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 8 to our consolidated financial statements.

For additional information concerning our derivative instruments, see note 8 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 gains (losses), net, are as follows:

	Year ended December 31,	
	2022	2021
in millions		
Intercompany payables and receivables denominated in a currency other than the entity's functional currency (a)	\$ 1,806.7	\$ 1,595.7
U.S. dollar denominated debt issued by euro functional currency entities	(476.7)	(399.1)
Cash and restricted cash denominated in a currency other than the entity's functional currency	80.9	(101.1)
U.S. dollar denominated debt issued by British pound sterling functional currency entities	—	246.2
Euro denominated debt issued by British pound sterling functional currency entities	—	(24.1)
Other	(3.7)	6.9
Total	<u>\$ 1,407.2</u>	<u>\$ 1,324.5</u>

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

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

Realized and unrealized gains (losses) due to changes in fair values of certain investments, net

Our realized and unrealized gains or losses due to changes in fair values of certain investments 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 (losses) due to changes in fair values of certain investments, net, are as follows:

	Year ended December 31,	
	2022	2021
	in millions	
ITV	\$ (233.9)	\$ 15.3
Pax8	79.3	—
Lionsgate	(69.2)	33.9
SMA's	(49.1)	(10.1)
EdgeConneX	43.4	28.9
Plume	(34.8)	133.9
Skillz	(34.7)	(100.4)
TiBiT (a)	26.4	—
Lacework	(26.3)	223.9
Televisa Univision	23.1	301.6
Aviatrix	—	65.4
Other, net (b)	(26.3)	42.6
Total	<u>\$ (302.1)</u>	<u>\$ 735.0</u>

(a) Our investment in TiBiT was sold during the fourth quarter of 2022.

(b) Includes gains of \$15.7 million and \$12.9 million, respectively, related to investments that were sold during the year.

Gains (losses) on debt extinguishment, net

We recognized net gains (losses) on debt extinguishment of \$2.8 million and (\$90.6 million) during 2022 and 2021, respectively.

The gain during 2022 is attributable to (i) a net gain associated with settlement discounts of \$9.8 million, (ii) the write-off of \$5.5 million of unamortized deferred financing costs and discounts and (iii) the payment of \$1.5 million of third-party costs.

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

For additional information concerning our gains (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,	
	2022	2021
in millions		
VMO2 JV (a)	\$ (1,396.6)	\$ (97.2)
VodafoneZiggo JV (b)	241.2	(32.0)
Streamz	(35.2)	(0.7)
Eltrona	(34.2)	(17.2)
AtlasEdge JV	(23.3)	(5.8)
Formula E	(20.2)	(2.5)
All3Media	(10.0)	(17.4)
Other	10.5	(2.6)
Total	<u>\$ (1,267.8)</u>	<u>\$ (175.4)</u>

- (a) Represents (i) our 50% share of the results of operations of the VMO2 JV and (ii) 100% of the share-based compensation expense associated with Liberty Global awards granted to VMO2 JV employees who were formerly employees of Liberty Global prior to the VMO2 JV formation, as these awards remain our responsibility. The summarized results of operations of the VMO2 JV are set forth below:

	Year ended December 31,	
	2022	2021 (1)
in millions		
Revenue	\$ 12,857.2	\$ 8,522.9
Adjusted EBITDA	\$ 4,562.2	\$ 2,716.6
Operating income (expense) (2)	\$ (3,461.5)	\$ 74.8
Non-operating income (expense) (3)	\$ 448.7	\$ (426.4)
Net loss	<u>\$ (3,042.0)</u>	<u>\$ (173.2)</u>

(1) Includes the operating results of the VMO2 JV for the period from June 1, 2021 through December 31, 2021.

(2) Includes depreciation and amortization expense of \$4,108.5 million and \$2,551.2 million, respectively.

(3) Includes interest expense of \$1,016.2 million and \$568.6 million, respectively. The 2022 amount includes a charge of £3.1 billion (\$3.6 billion at the applicable rate) related to the VMO2 JV's goodwill impairment, as described in note 7 to our consolidated financial statements.

The VMO2 JV was formed on June 1, 2021. As a result, the reported amounts for 2021 are based on results for the period beginning June 1, 2021. The change in the VMO2 JV's revenue during 2022, as compared to 2021, is primarily due to the net effect of (i) an increase in mobile subscription revenue and (ii) a decrease in B2B revenue, with each revenue category as defined and reported by the VMO2 JV. The change in the VMO2 JV's Adjusted EBITDA during 2022, as compared to 2021, is primarily due to the net effect of (a) the realization of synergies and cost efficiencies and (b) higher energy costs. In addition, the reported revenue and Adjusted EBITDA amounts are impacted by FX.

- (b) Represents (i) our 50% share of the results of operations of the VodafoneZiggo JV and (ii) interest income of \$53.8 million and \$56.5 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,	
	2022	2021
	in millions	
Revenue	\$ 4,284.6	\$ 4,824.2
Adjusted EBITDA	\$ 2,018.0	\$ 2,265.6
Operating income (1)	\$ 394.1	\$ 351.2
Non-operating income (expense) (2)	\$ 214.2	\$ (442.1)
Net earnings (loss)	\$ 394.7	\$ (163.1)

(1) Includes depreciation and amortization expense of \$1,610.7 million and \$1,870.0 million, respectively.

(2) Includes interest expense of \$606.4 million and \$605.0 million, respectively.

The decrease in the VodafoneZiggo JV's revenue during 2022, as compared to 2021, is primarily due to the net effect of (i) a decrease in residential fixed revenue, (ii) an increase in B2B revenue and (iii) higher residential mobile revenue. The decrease in the VodafoneZiggo JV's Adjusted EBITDA during 2022, as compared to 2021, is primarily due to inflation-related increases in energy and staff costs. In addition, the reported revenue and Adjusted EBITDA amounts are impacted by FX.

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

Gain on Telenet Tower Sale

In connection with the Telenet Tower Sale, we recognized a pre-tax gain during 2022 of \$700.5 million. For additional information, see note 6 to our consolidated financial statements.

Gain on U.K. JV Transaction

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

Gain on AtlasEdge JV Transactions

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

Other income, net

We recognized other income, net, of \$134.4 million and \$44.9 million during 2022 and 2021, respectively. These amounts include (i) interest and dividend income of \$76.6 million and \$13.9 million, respectively, and (ii) credits related to the non-service component of our net periodic pension costs of \$33.9 million and \$38.9 million, respectively.

Income tax benefit (expense)

We recognized income tax expense of \$318.9 million and \$473.3 million during 2022 and 2021, respectively.

The income tax expense during 2022 differs from the expected income tax expense of \$270.6 million (based on the U.K. statutory income tax rate of 19.0%), primarily due to the net negative impact of (i) statutory rates in certain jurisdictions in which we operate that differ from the U.K. statutory income tax rate, (ii) certain permanent differences between the financial and tax accounting treatment of interest and other expenses and (iii) certain permanent differences between the financial and tax accounting treatment of items associated with investments in subsidiaries and affiliates. The negative impact of these items was partially offset by the net positive impact of non-deductible or non-taxable foreign currency exchange results.

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

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

Earnings (loss) from continuing operations

During 2022 and 2021, we reported earnings from continuing operations of \$1,105.3 million and \$13,527.5 million, respectively, consisting of (i) operating income of \$146.8 million and \$1,320.3 million, respectively, (ii) net non-operating income of \$1,277.4 million and \$12,680.5 million, respectively, and (iii) income tax expense of \$318.9 million and \$473.3 million, respectively.

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

Due largely to the fact that we seek to maintain our debt at levels that provide for attractive equity returns, as discussed under *Material Changes in Financial Condition — Capitalization* below, we expect 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 \$34.6 million and \$82.6 million during 2022 and 2021, respectively, related to the results of UPC Poland. In addition, we recognized a gain on the sale of UPC Poland of \$846.4 million during 2022, which includes a cumulative foreign currency translation gain of \$10.9 million. For additional information, see note 6 to our consolidated financial statements.

Net earnings attributable to noncontrolling interests

Net earnings attributable to noncontrolling interests were \$513.1 million and \$183.3 million during 2022 and 2021, respectively, primarily attributable to the results of operations of Telenet.

Liquidity and Capital Resources

Sources and Uses of Cash

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

Cash, Cash Equivalents and SMAs

The details of the U.S. dollar equivalent balances of our consolidated cash and cash equivalents and investments held under SMAs at December 31, 2022 are set forth in the following table (in millions):

Cash and cash equivalents held by:	
Liberty Global and unrestricted subsidiaries:	
Liberty Global (a)	\$ 1.8
Unrestricted subsidiaries (b)	580.5
Total Liberty Global and unrestricted subsidiaries	582.3
Borrowing groups (c):	
Telenet	1,140.0
UPC Holding	3.0
VM Ireland	0.9
Total borrowing groups	1,143.9
Total cash and cash equivalents (d)	1,726.2
Investments held under SMAs (e)	2,854.6
Total cash and cash equivalents and investments held under SMAs	\$ 4,580.8

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

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

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

(d) The total cash and cash equivalents balance includes \$1,307.9 million or 75.8% and \$347.2 million or 20.1% denominated in euros and U.S. dollars, respectively.

(e) The balance of our investments held under SMAs was denominated entirely in U.S. dollars.

For additional information regarding our cash and cash equivalents and investments held under SMAs, see the discussion under *Quantitative and Qualitative Disclosures about Market Risk — Cash and Investments* below.

Liquidity of Liberty Global and its Unrestricted Subsidiaries

The \$1.8 million of cash and cash equivalents held by Liberty Global and, subject to certain tax and legal considerations, the \$580.5 million of aggregate cash and cash equivalents held by unrestricted subsidiaries, together with the \$2,854.6 million of investments held under SMAs, represented available liquidity at the corporate level at December 31, 2022. Our remaining cash and cash equivalents of \$1,143.9 million at December 31, 2022 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, 2022, see note 11 to our consolidated financial statements.

Our short-term sources of corporate liquidity include (i) cash and cash equivalents held by Liberty Global and, subject to certain tax and legal considerations, Liberty Global's unrestricted subsidiaries, (ii) investments held under SMAs, (iii) interest and dividend income received on our and, subject to certain tax and legal considerations, our unrestricted subsidiaries' cash and cash equivalents and investments, including dividend distributions received from the VMO2 JV or 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 dividend distributions or loan repayments from Liberty Global's borrowing groups or affiliates (including amounts from the VMO2 JV or 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, such as the sale of UPC Poland, and (iii) proceeds in connection with the incurrence of debt by Liberty Global or its unrestricted subsidiaries or the issuance of equity securities by Liberty Global, including equity securities issued to satisfy subsidiary obligations. No assurance can be given that any external funding would be available to Liberty Global or its unrestricted subsidiaries on favorable terms, or at all.

At December 31, 2022, our consolidated cash and cash equivalents balance included \$1,345.8 million held by entities that are domiciled outside of the U.K. Based on our assessment of our ability to access the liquidity of our subsidiaries on a tax efficient basis and our expectations with respect to our corporate liquidity requirements, we do not anticipate that tax considerations will adversely impact our corporate liquidity over the next 12 months. Our ability to access the liquidity of our subsidiaries on a tax efficient basis is a consideration in assessing the extent of our share repurchase program.

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

Our short- and long-term liquidity requirements include corporate general and administrative expenses and, from time to time, cash requirements in connection with (i) the repayment of third-party and intercompany debt, (ii) the satisfaction of contingent liabilities, (iii) acquisitions, (iv) the repurchase of equity and debt securities, (v) other investment opportunities, (vi) any funding requirements of our subsidiaries and affiliates or (vii) income tax payments. In addition, our parent entity uses available liquidity to make interest and principal payments on notes payable to certain of our unrestricted subsidiaries (aggregate outstanding principal of \$12.7 billion at December 31, 2022 with varying maturity dates).

During 2022, the aggregate amount of our share repurchases, including direct acquisition costs, was \$1,702.6 million. As a U.K. incorporated company, we may only elect to repurchase shares or pay dividends to the extent of our Distributable Reserves. Under our current repurchase program, we are authorized during 2023 to repurchase 10% of our total outstanding shares as of the beginning of the year. For additional information regarding our share repurchase programs, see note 14 to our consolidated financial statements.

Liquidity of Borrowing Groups

The cash and cash equivalents of our borrowing groups are detailed in the table above. In addition to cash and cash equivalents, the primary sources of liquidity of our borrowing groups are cash provided by operations and borrowing availability under their respective debt instruments. For the details of the borrowing availability of our borrowing groups at December 31, 2022, 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, 2022 consolidated balance sheet. In this regard, we have significant commitments related to (a) certain operating costs associated with our networks, (b) purchase obligations associated with CPE and certain service-related commitments and (c) programming studio output and sports rights contracts. These obligations are expected to represent a significant liquidity requirement of our borrowing groups, a significant portion of which is due over the next 12 to 24 months. For additional information regarding our commitments, see note 18 to our consolidated financial statements.

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

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

Capitalization

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

Our ability to service or refinance our debt and to maintain compliance with the leverage covenants in the credit agreements and indentures of our borrowing groups is dependent primarily on our ability to maintain or increase the Adjusted EBITDA of our operating subsidiaries and to achieve adequate returns on our property and equipment additions and acquisitions. In addition, our ability to obtain additional debt financing is limited by the incurrence-based leverage covenants contained in the various debt instruments of our borrowing groups. For example, if the Adjusted EBITDA of one of our borrowing groups were to decline, our ability to obtain additional debt could be limited. Under our credit facilities and senior and senior secured notes there is no cross-default risk between subsidiary borrowing groups in the event that one or more of our borrowing groups were to experience significant declines in their Adjusted EBITDA to the extent they were no longer able to service their debt obligations. Any mandatory prepayment events or events of default that may occur would only impact the relevant borrowing group in which these events occur and do not allow for any recourse to other borrowing groups or Liberty Global plc. Our credit facilities and senior and senior secured notes require that certain members of the relevant borrowing group guarantee the payment of all sums payable thereunder and such group members are required to grant first-ranking security over their shares or, in certain borrowing groups, over substantially all of their assets to secure the payment of all sums payable thereunder. At December 31, 2022, 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, 2022, the outstanding principal amount of our consolidated debt, together with our finance lease obligations, aggregated \$13.8 billion, including \$0.8 billion that is classified as current on our consolidated balance sheet and \$12.7 billion that is not due until 2028 or thereafter. All of our consolidated debt and finance lease obligations have been borrowed or incurred by our subsidiaries at December 31, 2022.

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, sovereign debt concerns or any adverse regulatory developments could impact the credit and equity markets we access and, accordingly, our future liquidity and financial position. Our ability to access debt financing on favorable terms, or at all, could be adversely impacted by (i) the financial failure of any of our counterparties, which could (a) reduce amounts available under committed credit facilities and (b) adversely impact our ability to access cash deposited with any failed financial institution, and (ii) tightening of the credit markets. In addition, any weakness in the equity markets could make it less attractive to use our shares to satisfy contingent or other obligations, and sustained or increased competition, particularly in combination with adverse economic or regulatory developments, could have an unfavorable impact on our cash flows and liquidity.

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

Consolidated Statements of Cash Flows

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

Summary. The 2022 and 2021 consolidated statements of cash flows of our continuing operations are summarized as follows:

	Year ended December 31,		Change
	2022	2021	
	in millions		
Net cash provided by operating activities	\$ 2,786.7	\$ 3,364.0	\$ (577.3)
Net cash provided (used) by investing activities	1,296.6	(5,745.5)	7,042.1
Net cash used by financing activities	(3,273.4)	(1,512.6)	(1,760.8)
Effect of exchange rate changes on cash and cash equivalents and restricted cash	(27.7)	(6.6)	(21.1)
Net increase (decrease) in cash and cash equivalents and restricted cash	<u>\$ 782.2</u>	<u>\$ (3,900.7)</u>	<u>\$ 4,682.9</u>

Operating Activities. The decrease in net cash provided by our operating activities is primarily attributable to the net effect of (i) a decrease in cash provided by our Adjusted EBITDA and related working capital items, which includes (a) the impact of the U.K. JV Transaction and (b) an increase in cash of \$113.7 million (at the applicable rate) in connection with the sale of certain handset receivables in Switzerland, (ii) an increase in cash provided due to higher dividend distributions from the VMO2 JV, (iii) a decrease due to FX, (iv) an increase in cash provided due to lower payments of interest, including the impact of the U.K. JV Transaction, (v) an increase in cash provided due to higher net cash receipts related to derivative instruments, and (vi) an increase in cash provided due to higher receipts of interest. 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 (i) an increase in cash of \$3,424.0 million associated with restricted cash contributed to the VMO2 JV in connection with the U.K. JV Transaction during the first six months of 2021, (ii) an increase in cash of \$1,553.3 million in connection with the sale of UPC Poland, (iii) an increase in cash of \$870.5 million associated with lower net cash paid for investments, primarily related to our investments held under SMAs, (iv) an increase in cash of \$779.9 million in connection with the Telenet Tower Sale and (v) an increase in cash of \$477.9 million due to higher dividend distributions received from the VMO2 JV. Capital expenditures decreased from \$1,408.0 million during 2021 to \$1,303.2 million during 2022 due to the net effect of (a) a decrease due to the impact of the U.K. JV Transaction, (b) a decrease due to FX and (c) an increase in our net local currency capital expenditures and related working capital movements, including the impact of lower capital-related vendor financing.

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

	Year ended December 31,	
	2022	2021
	in millions	
Property and equipment additions	\$ 1,588.9	\$ 2,169.5
Assets acquired under capital-related vendor financing arrangements	(182.8)	(661.1)
Assets acquired under finance leases	(34.2)	(42.6)
Changes in current liabilities related to capital expenditures	(68.7)	(57.8)
Capital expenditures, net	<u>\$ 1,303.2</u>	<u>\$ 1,408.0</u>

The decrease in our property and equipment additions during 2022, as compared to 2021, is primarily due to the net effect of (i) a decrease due to the impact of the U.K. JV Transaction, (ii) a decrease due to FX, (iii) an increase in local currency expenditures of our subsidiaries due to the net effect of (a) an increase in expenditures for the purchase and installation of CPE, (b) an increase in expenditures for new build and upgrade projects, (c) a decrease in baseline expenditures, including network improvements and expenditures for property and facilities and information technology systems, and (d) a decrease in expenditures to support new customer products and operational efficiency initiatives. During 2022 and 2021, our property and equipment additions represented 22.1% and 21.0% of revenue, respectively.

We expect our 2023 property and equipment additions to remain relatively stable as compared to our 2022 property and equipment additions. The actual amount of our 2023 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 increase in net cash used by our financing activities is primarily attributable to the net effect of (i) an increase in cash used of \$1,825.9 million due to higher net repayments of debt, (ii) a decrease in cash used of \$287.3 million due to lower net repayments of vendor financing, including the impact of the U.K. JV Transaction, (iii) an increase in cash used of \$193.6 million due to higher net payments related to derivatives and (iv) an increase in cash used of \$123.0 million due to higher repurchases of Liberty Global ordinary shares.

Adjusted Free Cash Flow

We define adjusted free cash flow as net cash provided by the operating activities of our continuing operations, plus operating-related vendor financed expenses (which represents an increase in the period to our actual cash available as a result of extending vendor payment terms beyond normal payment terms, which are typically 90 days or less, through non-cash financing activities), less (i) cash payments in the period for capital expenditures, (ii) principal payments on operating- and capital-related amounts financed by vendors and intermediaries (which represents a decrease in the period to our actual cash available as a result of paying amounts to vendors and intermediaries where we previously had extended vendor payments beyond the normal payment terms) and (iii) principal payments on finance leases (which represents a decrease in the period to our actual cash available), each as reported in our consolidated statements of cash flows with each item excluding any cash provided or used by our discontinued operations. Net cash provided by the operating activities of our continuing operations includes cash paid for third-party costs directly associated with successful and unsuccessful acquisitions and dispositions of \$36.2 million and \$80.5 million during 2022 and 2021, respectively.

We believe our presentation of adjusted free cash flow, which is a non-GAAP measure, provides useful information to our investors because this measure can be used to gauge our ability to (i) service debt and (ii) fund new investment opportunities after consideration of all actual cash payments related to our working capital activities and expenses that are capital in nature whether paid inside normal vendor payment terms or paid later outside normal vendor payment terms (in which case we typically pay in less than 365 days). Adjusted free cash flow should not be understood to represent our ability to fund discretionary amounts, as we have various mandatory and contractual obligations, including debt repayments, that are not deducted to arrive at these amounts. Investors should view adjusted free cash flow as a supplement to, and not a substitute for, GAAP measures of liquidity included in our consolidated statements of cash flows. Further, our adjusted free cash flow may differ from how other companies define and apply their definition of adjusted free cash flow.

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

	Year ended December 31,	
	2022	2021
	in millions	
Net cash provided by operating activities of our continuing operations	\$ 2,786.7	\$ 3,364.0
Operating-related vendor financing additions (a)	522.7	1,781.6
Cash capital expenditures, net	(1,303.2)	(1,408.0)
Principal payments on operating-related vendor financing	(616.1)	(1,408.0)
Principal payments on capital-related vendor financing	(210.1)	(964.4)
Principal payments on finance leases	(62.0)	(75.7)
Adjusted free cash flow	<u>\$ 1,118.0</u>	<u>\$ 1,289.5</u>

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

Critical Accounting Policies, Judgments and Estimates

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

- Impairment of goodwill;
- Costs associated with the capitalization of property and equipment;
- 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 Goodwill

Carrying Value. The aggregate carrying value of our goodwill comprised 21.7% of our total assets at December 31, 2022.

We evaluate goodwill for impairment at least annually on October 1 and whenever facts and circumstances indicate that a reporting unit's carrying amount may not be recoverable. For impairment evaluations, we first make a qualitative assessment to determine if the goodwill may be impaired. 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").

When required, considerable management judgment is necessary to estimate the fair value of reporting units. 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 2022 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, 2022, we did not record any significant impairment charges with respect to our goodwill. For additional information regarding our goodwill, 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. Any such impairment charges could be significant.

Costs Associated with the Capitalization of Property and Equipment

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

We make judgments regarding the construction, upgrade and installation activities to be capitalized and the development of internal-use software. 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, 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, construction or upgrade activities or the development of internal-use software are performed.

Fair Value Measurements

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

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

Changes in the fair values of our derivative instruments and fair value method investments have had, and we believe will continue to have, a significant and volatile impact on our results of operations. During 2022, 2021 and 2020, we recognized net gains (losses) of \$889.6 million, \$1,357.9 million and (\$833.5 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, 2022.

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

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

acquisition accounting and all of our long-lived assets are subject to impairment assessments. For additional information, see note 9 to our consolidated financial statements. For information regarding our acquisitions and long-lived assets, see notes 5 and 10 to our consolidated financial statements, respectively.

Income Tax Accounting

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

Net deferred tax assets are reduced by a valuation allowance if we believe that it is more-likely-than-not such net deferred tax assets will not be realized. Establishing or reducing a tax valuation allowance requires us to make assessments about the timing of future events, including the probability of expected future taxable income and available tax planning strategies. At December 31, 2022, the aggregate valuation allowance provided against deferred tax assets was \$1,586.5 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, 2022 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, 2022, the amount of unrecognized tax benefits for financial reporting purposes, but taken or expected to be taken in our tax returns, was \$435.2 million, of which \$337.9 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, 2022 and 2021, our consolidated cash balances included \$1,307.9 million or 75.8% and \$387.3 million or 42.5%, respectively, denominated in euros and \$347.2 million or 20.1% and \$468.8 million or 51.5%, respectively, denominated in U.S. dollars. At December 31, 2022 and 2021, the balances of our consolidated investments held under SMAs of \$2,854.6 million and \$2,801.3 million, respectively, were denominated entirely in U.S. dollars.

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, 2022, 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 and option contracts to hedge certain of these risks. For additional information concerning our foreign currency forward and option contracts, see note 8 to our consolidated financial statements.

We are also exposed to unfavorable and potentially volatile fluctuations of the U.S. dollar (our reporting currency) against the currencies of our operating subsidiaries when their respective financial statements are translated into U.S. dollars for inclusion in our consolidated financial statements. Cumulative translation adjustments are recorded in accumulated other comprehensive earnings or loss as a separate component of equity. Any increase (decrease) in the value of the U.S. dollar against any foreign currency that is the functional currency of one of our operating subsidiaries will cause us to experience unrealized foreign currency translation losses (gains) with respect to amounts already invested in such foreign currencies. Accordingly, we may experience a negative impact on our comprehensive earnings or loss and equity with respect to our holdings solely as a result of FX. Our primary exposure to FX risk during the three months ended December 31, 2022 was to the euro and Swiss franc, as 55.1% and 43.6% of our reported revenue during the period was derived from subsidiaries whose functional currencies are the euro and Swiss franc, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for other local currencies in Europe. We do not hedge against the risk that we may incur non-cash

losses upon the translation of the financial statements of our subsidiaries and affiliates into U.S. dollars. For additional information regarding certain currency instability risks, see *Management's Discussion and Analysis of Financial Condition and Results of Operations* 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,		
	2022	2021	
Spot rates:			
Euro	0.9337	0.8782	
Swiss franc	0.9219	0.9114	
British pound sterling	0.8265	0.7388	
Polish zloty	4.3686	4.0285	
	Year ended December 31,		
	2022	2021	2020
Average rates:			
Euro	0.9509	0.8455	0.8775
Swiss franc	0.9548	0.9139	0.9389
British pound sterling	0.8112	0.7269	0.7796
Polish zloty	4.4555	3.8595	3.8979

Inflation and Foreign Investment Risk

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

Interest Rate Risks

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

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

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

EURIBOR to ensure compliance with the E.U. Benchmarks Regulation. In November 2020, ICE Benchmark Administration (the entity that administers LIBOR) announced its intention to continue publishing USD LIBOR rates until June 30, 2023, with the exception of the one-week and two-month rates which, along with all CHF and GBP LIBOR rates, it ceased to publish after December 31, 2021. Furthermore, in November 2022, the U.K. Financial Conduct Authority proposed that certain tenors of USD LIBOR would continue to be published on a synthetic basis until the end of September 2024. While this extension allows additional runway on existing contracts using USD LIBOR rates, companies are still encouraged to transition away from using USD LIBOR as soon as practicable and should not enter into new contracts that use USD LIBOR after 2021. The methodology for EURIBOR has been reformed and EURIBOR has been granted regulatory approval to continue to be used. Currently, there is no consensus amongst loan borrowers and investors for what rate(s) should replace USD LIBOR.

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

Weighted Average Variable Interest Rate. At December 31, 2022 and 2021, the outstanding principal amount of our variable-rate indebtedness aggregated \$9.3 billion and \$9.6 billion, respectively, and the weighted average interest rate (including margin) on such variable-rate indebtedness was approximately 5.9% and 2.7%, respectively, 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 at December 31, 2022, 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 \$46.5 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, however notwithstanding, given the size of our derivative portfolio, the default of certain counterparties could have a significant impact on our consolidated statements of operations. Collateral is generally not posted by either party under the derivative instruments of our subsidiary borrowing groups. Most of our cash currently is invested in either (i) AAA-rated money market funds, including funds that invest in government obligations, or (ii) overnight deposits with banks having a minimum credit rating of A by Standard & Poor's or an equivalent rating by Moody's Investor Service. To date, neither the access to nor the value of our cash and cash equivalent balances have been adversely impacted by liquidity problems of financial institutions.

At December 31, 2022 and 2021, our exposure to counterparty credit risk included (i) cash and cash equivalent and restricted cash balances of \$1.7 billion and \$0.9 billion, respectively, (ii) aggregate undrawn debt facilities of \$1.5 billion and \$1.6 billion, respectively, and (iii) derivative assets with an aggregate fair value of \$922.5 million and \$57.8 million, respectively.

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

Under our derivative contracts, it is generally only the non-defaulting party that has a contractual option to exercise early termination rights upon the default of the other counterparty and to set off other liabilities against sums due upon such termination. However, in an insolvency of a derivative counterparty, under the laws of certain jurisdictions, the defaulting counterparty or its insolvency representatives may be able to compel the termination of one or more derivative contracts and trigger early termination payment liabilities payable by us, reflecting any mark-to-market value of the contracts for the counterparty. Alternatively, or in addition, the insolvency laws of certain jurisdictions may require the mandatory set off of amounts due under such derivative contracts against present and future liabilities owed to us under other contracts between us and the relevant counterparty. Accordingly, it is possible that we may be subject to obligations to make payments, or may have 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, 2022:

- (i) an instantaneous increase (decrease) of 10% in the value of the Swiss franc relative to the U.S. dollar would have decreased (increased) the aggregate fair value of the UPC Holding cross-currency and interest rate derivative contracts by approximately €414 million (\$444 million);
- (ii) an instantaneous increase (decrease) of 10% in the value of the Swiss franc 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 €325 million (\$348 million); and

- (iii) an instantaneous increase (decrease) in the relevant base rate of 50 basis points (0.50%) would have decreased (increased) the aggregate fair value of the UPC Holding cross-currency and interest rate derivative contracts by approximately €99 million (\$106 million).

Telenet Cross-currency and Interest Rate Derivative Contracts

Holding all other factors constant, at December 31, 2022:

- (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 €297 million (\$318 million); and
- (ii) an instantaneous increase (decrease) in the relevant base rate of 50 basis points (0.50%) would have decreased (increased) the aggregate fair value of the Telenet cross-currency and interest rate derivative contracts by approximately €72 million (\$78 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, 2022. These amounts are presented for illustrative purposes only and will likely differ from the actual cash payments or receipts required in future periods. For additional information regarding our derivative instruments, see note 8 to our consolidated financial statements. For information concerning the counterparty credit risk associated with our derivative instruments, see the discussion under *Counterparty Credit Risk* above.

	Payments (receipts) due during:						Total
	2023	2024	2025	2026	2027	Thereafter	
	in millions						
Projected derivative cash payments (receipts), net:							
Interest-related (a)	\$ (158.6)	\$ (379.6)	\$ (313.7)	\$ (275.3)	\$ (268.6)	\$ (297.9)	\$ (1,693.7)
Principal-related (b)	62.2	—	63.5	53.0	—	(54.2)	124.5
Other (c)	6.2	0.4	0.3	—	—	—	6.9
Total	<u>\$ (90.2)</u>	<u>\$ (379.2)</u>	<u>\$ (249.9)</u>	<u>\$ (222.3)</u>	<u>\$ (268.6)</u>	<u>\$ (352.1)</u>	<u>\$ (1,562.3)</u>

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

Item 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The consolidated financial statements of Liberty Global are filed under this Item, beginning on page II-42. 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, 2022. 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, 2022, 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-40.

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

The audit report of KPMG LLP is included herein on page II-41.

(c) Changes in Internal Control over Financial Reporting

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

Item 9B. OTHER INFORMATION

Not applicable.

Item 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

Management's Annual Report on Internal Control over Financial Reporting

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

Our management assessed the effectiveness of internal control over financial reporting as of December 31, 2022, 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, 2022. The effectiveness of our internal control over financial reporting has been audited by KPMG LLP, an independent registered public accounting firm, as stated in their report included herein.

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Liberty Global plc:

Opinion on Internal Control Over Financial Reporting

We have audited Liberty Global plc and subsidiaries' (the Company) internal control over financial reporting as of December 31, 2022, 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, 2022, 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, 2022 and 2021, 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, 2022, and the related notes and financial statement schedules I to II (collectively, the consolidated financial statements), and our report dated February 22, 2023 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ KPMG LLP

Denver, Colorado
February 22, 2023

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, 2022 and 2021, 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, 2022, and the related notes and financial statement schedules I to II (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2022, 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, 2022, 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 22, 2023 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates 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 a critical audit matter 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 matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Capitalization of external costs

As discussed in Notes 3 and 10 to the consolidated financial statements, the Company capitalizes certain external costs for construction and installation activities and internal use software. Capitalized external costs for construction and installation activities and internal use software are recorded within property and equipment, net which has a balance of \$6,504.5 million as of December 31, 2022.

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

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

/s/ KPMG LLP

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

Denver, Colorado
February 22, 2023

LIBERTY GLOBAL PLC
CONSOLIDATED BALANCE SHEETS

ASSETS	December 31,	
	2022	2021
	in millions	
Current assets:		
Cash and cash equivalents	\$ 1,726.2	\$ 910.6
Trade receivables, net	830.6	907.3
Short-term investments (measured at fair value on a recurring basis) (note 7)	2,621.6	2,269.6
Derivative instruments (note 8)	382.7	244.3
Current assets of discontinued operations (note 6)	—	925.0
Other current assets (notes 4 and 7)	736.3	683.7
Total current assets	6,297.4	5,940.5
Investments and related notes receivable (including \$2,179.0 million and \$2,757.8 million, respectively, measured at fair value on a recurring basis) (note 7)	14,856.1	19,703.0
Property and equipment, net (notes 10 and 12)	6,504.5	6,981.5
Goodwill (note 10)	9,316.1	9,523.4
Intangible assets subject to amortization, net (note 10)	2,342.4	2,342.5
Other assets, net (notes 4, 8, 12 and 13)	3,578.5	2,426.1
Total assets	\$ 42,895.0	\$ 46,917.0

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

LIBERTY GLOBAL PLC
CONSOLIDATED BALANCE SHEETS — (Continued)

	December 31,	
	2022	2021
	in millions	
LIABILITIES AND EQUITY		
Current liabilities:		
Accounts payable	\$ 610.1	\$ 613.4
Deferred revenue (note 4)	264.4	274.7
Current portion of debt and finance lease obligations (notes 11 and 12)	799.7	850.3
Accrued capital expenditures	244.0	257.7
Accrued income taxes	235.6	236.6
Derivative instruments (note 8)	296.8	221.8
Current liabilities of discontinued operations (note 6)	—	201.3
Other accrued and current liabilities (note 12)	1,470.4	1,429.0
Total current liabilities	3,921.0	4,084.8
Long-term debt and finance lease obligations (notes 11 and 12)	12,963.5	13,974.8
Long-term operating lease liabilities (notes 6 and 12)	1,645.9	1,226.1
Other long-term liabilities (notes 4, 8, 13 and 16)	1,791.2	2,033.3
Total liabilities	20,321.6	21,319.0
Commitments and contingencies (notes 8, 11, 12, 13, 16 and 18)		
Equity (note 14):		
Liberty Global shareholders:		
Class A ordinary shares, \$0.01 nominal value. Issued and outstanding 171,917,370 and 174,310,558 shares, respectively	1.8	1.8
Class B ordinary shares, \$0.01 nominal value. Issued and outstanding 12,994,000 and 12,930,839 shares, respectively	0.1	0.1
Class C ordinary shares, \$0.01 nominal value. Issued and outstanding 274,436,585 and 340,114,729 shares, respectively	2.7	3.4
Additional paid-in capital	2,300.8	3,893.0
Accumulated earnings	19,617.7	18,144.5
Accumulated other comprehensive earnings, net of taxes	513.4	3,892.2
Treasury shares, at cost	(0.1)	(0.1)
Total Liberty Global shareholders	22,436.4	25,934.9
Noncontrolling interests	137.0	(336.9)
Total equity	22,573.4	25,598.0
Total liabilities and equity	\$ 42,895.0	\$ 46,917.0

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF OPERATIONS

	Year ended December 31,		
	2022	2021	2020
in millions, except per share amounts			
Revenue (notes 4, 6, 7 and 19)	\$ 7,195.7	\$ 10,311.3	\$ 11,545.4
Operating costs and expenses (exclusive of depreciation and amortization, shown separately below):			
Programming and other direct costs of services	2,085.7	3,017.6	3,320.6
Other operating (note 15)	1,088.2	1,484.6	1,719.3
Selling, general and administrative (SG&A) (note 15)	1,618.5	2,154.1	2,150.0
Depreciation and amortization (note 10)	2,171.4	2,353.7	2,227.2
Impairment, restructuring and other operating items, net (notes 5 and 16)	85.1	(19.0)	97.4
	<u>7,048.9</u>	<u>8,991.0</u>	<u>9,514.5</u>
Operating income	146.8	1,320.3	2,030.9
Non-operating income (expense):			
Interest expense	(589.3)	(882.1)	(1,186.8)
Realized and unrealized gains (losses) on derivative instruments, net (note 8)	1,191.7	622.9	(878.7)
Foreign currency transaction gains (losses), net	1,407.2	1,324.5	(1,409.3)
Realized and unrealized gains (losses) due to changes in fair values of certain investments, net (notes 7 and 9)	(302.1)	735.0	45.2
Gains (losses) on debt extinguishment, net (note 11)	2.8	(90.6)	(233.2)
Share of results of affiliates, net (note 7)	(1,267.8)	(175.4)	(245.3)
Gain on Telenet Tower Sale (note 6)	700.5	—	—
Gain on U.K. JV Transaction (note 6)	—	10,873.8	—
Gain on AtlasEdge JV Transactions (note 6)	—	227.5	—
Other income, net	134.4	44.9	76.2
	<u>1,277.4</u>	<u>12,680.5</u>	<u>(3,831.9)</u>
Earnings (loss) from continuing operations before income taxes	1,424.2	14,000.8	(1,801.0)
Income tax benefit (expense) (note 13)	(318.9)	(473.3)	275.9
Earnings (loss) from continuing operations	<u>1,105.3</u>	<u>13,527.5</u>	<u>(1,525.1)</u>
Discontinued operations (note 6):			
Earnings from discontinued operations, net of taxes	34.6	82.6	58.4
Gain on disposal of discontinued operations, net of taxes	846.4	—	—
	<u>881.0</u>	<u>82.6</u>	<u>58.4</u>
Net earnings (loss)	1,986.3	13,610.1	(1,466.7)
Net earnings attributable to noncontrolling interests	(513.1)	(183.3)	(161.3)
Net earnings (loss) attributable to Liberty Global shareholders	<u>\$ 1,473.2</u>	<u>\$ 13,426.8</u>	<u>\$ (1,628.0)</u>
Basic earnings (loss) attributable to Liberty Global shareholders per share (note 3):			
Continuing operations	\$ 1.21	\$ 24.01	\$ (2.80)
Discontinued operations (note 6)	1.80	0.15	0.10
	<u>\$ 3.01</u>	<u>\$ 24.16</u>	<u>\$ (2.70)</u>
Diluted earnings (loss) attributable to Liberty Global shareholders per share (note 3):			
Continuing operations	\$ 1.19	\$ 23.45	\$ (2.80)
Discontinued operations (note 6)	1.77	0.14	0.10
	<u>\$ 2.96</u>	<u>\$ 23.59</u>	<u>\$ (2.70)</u>

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,		
	2022	2021	2020
	in millions		
Net earnings (loss)	\$ 1,986.3	\$ 13,610.1	\$ (1,466.7)
Other comprehensive earnings (loss), net of taxes (note 17):			
Continuing operations:			
Foreign currency translation adjustments	(3,214.8)	(1,069.8)	2,586.2
Reclassification adjustment included in net earnings (loss) (note 6)	(4.2)	1,249.3	(1.5)
Pension-related adjustments and other	(113.2)	80.7	(17.2)
Other comprehensive earnings (loss) from continuing operations	(3,332.2)	260.2	2,567.5
Other comprehensive earnings (loss) from discontinued operations (note 6)	(44.4)	(59.9)	13.5
Other comprehensive earnings (loss)	(3,376.6)	200.3	2,581.0
Comprehensive earnings (loss)	(1,390.3)	13,810.4	1,114.3
Comprehensive earnings attributable to noncontrolling interests	(515.3)	(184.5)	(161.9)
Comprehensive earnings (loss) attributable to Liberty Global shareholders	<u>\$ (1,905.6)</u>	<u>\$ 13,625.9</u>	<u>\$ 952.4</u>

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF EQUITY

	Liberty Global shareholders									
	Ordinary shares			Additional paid-in capital	Accumulated earnings	Accumulated other comprehensive earnings, net of taxes	Treasury shares, at cost	Total Liberty Global shareholders	Non- controlling interests	Total equity
	Class A	Class B	Class C							
	in millions									
Balance at January 1, 2020, before effect of accounting change	\$ 1.8	\$ 0.1	\$ 4.4	\$ 6,136.9	\$ 6,350.4	\$ 1,112.7	\$ (0.1)	\$ 13,606.2	\$ (407.6)	\$13,198.6
Impact of ASU No. 2016-13 (note 2)	—	—	—	—	(30.3)	—	—	(30.3)	0.2	(30.1)
Balance at January 1, 2020 as adjusted for accounting change	1.8	0.1	4.4	6,136.9	6,320.1	1,112.7	(0.1)	13,575.9	(407.4)	13,168.5
Net loss	—	—	—	—	(1,628.0)	—	—	(1,628.0)	161.3	(1,466.7)
Other comprehensive earnings, net of taxes (note 17)	—	—	—	—	—	2,580.4	—	2,580.4	0.6	2,581.0
Repurchases and cancellations of Liberty Global ordinary shares (note 14)	—	—	(0.5)	(1,071.8)	—	—	—	(1,072.3)	—	(1,072.3)
Share-based compensation (note 15)	—	—	—	261.7	—	—	—	261.7	—	261.7
Dividend 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	<u>\$ 1.8</u>	<u>\$ 0.1</u>	<u>\$ 3.9</u>	<u>\$ 5,271.7</u>	<u>\$ 4,692.1</u>	<u>\$ 3,693.1</u>	<u>\$ (0.1)</u>	<u>\$ 13,662.6</u>	<u>\$ (364.2)</u>	<u>\$13,298.4</u>

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF EQUITY — (Continued)

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

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF EQUITY — (Continued)

	Liberty Global shareholders										
	Ordinary shares			Additional paid-in capital	Accumulated earnings	Accumulated other comprehensive earnings, net of taxes	Treasury shares, at cost	Total Liberty Global shareholders	Non- controlling interests	Total equity	
	Class A	Class B	Class C								
	in millions										
Balance at January 1, 2022	\$ 1.8	\$ 0.1	\$ 3.4	\$ 3,893.0	\$ 18,144.5	\$ 3,892.2	\$ (0.1)	\$ 25,934.9	\$ (336.9)	\$25,598.0	
Net earnings	—	—	—	—	1,473.2	—	—	1,473.2	513.1	1,986.3	
Other comprehensive loss, net of taxes (note 17)	—	—	—	—	—	(3,378.8)	—	(3,378.8)	2.2	(3,376.6)	
Repurchases and cancellations of Liberty Global ordinary shares (note 14)	—	—	(0.7)	(1,701.9)	—	—	—	(1,702.6)	—	(1,702.6)	
Share-based compensation (note 15)	—	—	—	171.1	—	—	—	171.1	—	171.1	
Dividend distributions by subsidiaries to noncontrolling interest owners (note 14)	—	—	—	—	—	—	—	—	(66.3)	(66.3)	
Repurchases by Telenet of its outstanding shares	—	—	—	(28.0)	—	—	—	(28.0)	3.1	(24.9)	
Adjustments due to changes in subsidiaries' equity and other, net	—	—	—	(33.4)	—	—	—	(33.4)	21.8	(11.6)	
Balance at December 31, 2022	<u>\$ 1.8</u>	<u>\$ 0.1</u>	<u>\$ 2.7</u>	<u>\$ 2,300.8</u>	<u>\$ 19,617.7</u>	<u>\$ 513.4</u>	<u>\$ (0.1)</u>	<u>\$ 22,436.4</u>	<u>\$ 137.0</u>	<u>\$22,573.4</u>	

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year ended December 31,		
	2022	2021	2020
	in millions		
Cash flows from operating activities:			
Net earnings (loss)	\$ 1,986.3	\$ 13,610.1	\$ (1,466.7)
Earnings from discontinued operations	881.0	82.6	58.4
Earnings (loss) from continuing operations	1,105.3	13,527.5	(1,525.1)
Adjustments to reconcile earnings (loss) from continuing operations to net cash provided by operating activities of continuing operations:			
Share-based compensation expense	192.1	308.1	348.0
Depreciation and amortization	2,171.4	2,353.7	2,227.2
Impairment, restructuring and other operating items, net	85.1	(19.0)	97.4
Amortization of deferred financing costs and non-cash interest	31.0	31.9	44.8
Realized and unrealized losses (gains) on derivative instruments, net	(1,191.7)	(622.9)	878.7
Foreign currency transaction losses (gains), net	(1,407.2)	(1,324.5)	1,409.3
Realized and unrealized losses (gains) due to changes in fair values of certain investments, net	302.1	(735.0)	(45.2)
Losses (gains) on debt extinguishment, net	(2.8)	90.6	233.2
Share of results of affiliates, net	1,267.8	175.4	245.3
Deferred income tax expense (benefit)	172.5	318.2	(262.9)
Gain on Telenet Tower Sale	(700.5)	—	—
Gain on U.K. JV Transaction	—	(10,873.8)	—
Gain on AtlasEdge JV Transactions	—	(227.5)	—
Changes in operating assets and liabilities, net of the effects of acquisitions and dispositions:			
Receivables and other operating assets	796.3	707.1	947.3
Payables and accruals	(755.9)	(872.3)	(830.7)
Dividend distributions received from the VMO2 JV	454.6	214.8	—
Dividend distributions received from the VodafoneZiggo JV	266.6	311.7	249.5
Net cash provided by operating activities of continuing operations	2,786.7	3,364.0	4,016.8
Net cash provided by operating activities of discontinued operations	51.1	185.0	169.0
Net cash provided by operating activities	\$ 2,837.8	\$ 3,549.0	\$ 4,185.8

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,		
	2022	2021	2020
	in millions		
Cash flows from investing activities:			
Cash paid for investments	\$ (9,433.8)	\$ (7,261.8)	\$ (8,240.5)
Cash received from the sale of investments	9,213.3	6,170.8	6,031.9
Cash received in connection with the sale of UPC Poland	1,553.3	—	—
Capital expenditures, net	(1,303.2)	(1,408.0)	(1,292.8)
Cash received in connection with the Telenet Tower Sale	779.9	—	—
Dividend distributions received from the VMO2 JV	477.9	—	—
Cash released from the Vodafone Escrow Accounts, net	6.5	214.9	104.9
Cash received (paid) in connection with acquisitions, net of cash acquired	2.7	(70.8)	(5,267.8)
Net cash received in connection with the AtlasEdge JV Transactions	—	144.5	—
Cash and restricted cash contributed to the VMO2 JV in connection with the U.K. JV Transaction	—	(3,424.0)	—
Loans to the VodafoneZiggo JV	—	(123.0)	(122.7)
Net cash received in connection with the U.K. JV Transaction	—	108.6	—
Other investing activities, net	—	(96.7)	(30.2)
Net cash provided (used) by investing activities of continuing operations	1,296.6	(5,745.5)	(8,817.2)
Net cash used by investing activities of discontinued operations	(15.6)	(51.0)	(56.8)
Net cash provided (used) by investing activities	<u>1,281.0</u>	<u>(5,796.5)</u>	<u>(8,874.0)</u>
Cash flows from financing activities:			
Borrowings of debt	4.7	2,570.7	13,205.8
Operating-related vendor financing additions	522.7	1,781.6	2,754.5
Repayments and repurchases of debt and finance lease obligations:			
Debt (excluding vendor financing)	(980.9)	(1,721.0)	(8,857.1)
Principal payments on operating-related vendor financing	(616.1)	(1,408.0)	(2,381.7)
Principal payments on capital-related vendor financing	(210.1)	(964.4)	(2,088.8)
Principal payments on finance leases	(62.0)	(75.7)	(86.0)
Repurchases of Liberty Global ordinary shares	(1,703.4)	(1,580.4)	(1,072.3)
Dividend distributions by subsidiaries to noncontrolling interest owners	(61.1)	(137.6)	(137.1)
Net cash received (paid) related to derivative instruments	(50.0)	143.6	129.1
Payment of financing costs and debt premiums	(28.5)	(23.3)	(290.0)
Other financing activities, net	(88.7)	(98.1)	(71.9)
Net cash provided (used) by financing activities of continuing operations	(3,273.4)	(1,512.6)	1,104.5
Net cash used by financing activities of discontinued operations	(2.6)	(33.3)	(20.9)
Net cash provided (used) by financing activities	<u>\$ (3,276.0)</u>	<u>\$ (1,545.9)</u>	<u>\$ 1,083.6</u>

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,		
	2022	2021	2020
in millions			
Effect of exchange rate changes on cash and cash equivalents and restricted cash:			
Continuing operations	\$ (27.7)	\$ (6.6)	\$ 141.0
Discontinued operations	—	—	—
Total	(27.7)	(6.6)	141.0
Net increase (decrease) in cash and cash equivalents and restricted cash:			
Continuing operations	782.2	(3,900.7)	(3,554.9)
Discontinued operations	32.9	100.7	91.3
Total	815.1	(3,800.0)	(3,463.6)
Cash and cash equivalents and restricted cash:			
Beginning of year	917.3	4,717.3	8,180.9
Net increase (decrease)	815.1	(3,800.0)	(3,463.6)
End of year	<u>\$ 1,732.4</u>	<u>\$ 917.3</u>	<u>\$ 4,717.3</u>
Cash paid for interest:			
Continuing operations	\$ 547.1	\$ 830.3	\$ 1,126.0
Discontinued operations	0.3	1.7	1.7
Total	<u>\$ 547.4</u>	<u>\$ 832.0</u>	<u>\$ 1,127.7</u>
Net cash paid for taxes:			
Continuing operations	\$ 164.3	\$ 156.2	\$ 228.9
Discontinued operations	7.4	34.2	18.8
Total	<u>\$ 171.7</u>	<u>\$ 190.4</u>	<u>\$ 247.7</u>
Details of end of year cash and cash equivalents and restricted cash:			
Cash and cash equivalents	\$ 1,726.2	\$ 910.6	\$ 1,327.2
Restricted cash included in other current assets and other assets, net	6.2	6.7	6.8
Cash and cash equivalents and restricted cash included in assets held for sale	—	—	3,383.3
Total cash and cash equivalents and restricted cash	<u>\$ 1,732.4</u>	<u>\$ 917.3</u>	<u>\$ 4,717.3</u>

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

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements
December 31, 2022, 2021 and 2020

(1) Basis of Presentation

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

Our continuing operations comprise businesses that provide residential and business-to-business (**B2B**) communications services in (i) Switzerland and Slovakia through certain wholly-owned subsidiaries that we collectively refer to as “**UPC Holding**”, (ii) Belgium through Telenet Group Holding N.V. (**Telenet**), a 61.1%-owned subsidiary, and (iii) Ireland through another wholly-owned subsidiary (**VM Ireland**). In addition, we own 50% noncontrolling interests in (a) a 50:50 joint venture (the **VMO2 JV**) with Telefónica SA (**Telefónica**), which provides residential and B2B communication services in the United Kingdom (**U.K.**), and (b) a 50:50 joint venture (the **VodafoneZiggo JV**) with Vodafone Group plc (**Vodafone**), which provides residential and B2B communication services in the Netherlands.

Through March 31, 2022, we provided residential and B2B communications services in Poland through UPC Holding. On April 1, 2022, we completed the sale of our operations in Poland. Accordingly, in these consolidated financial statements, our operations in Poland are reflected as discontinued operations for all applicable periods. For additional information, see note 6.

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

These consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States (**GAAP**). Unless otherwise indicated, the amounts presented in these notes relate only to our continuing operations, and ownership percentages and convenience translations into United States (U.S.) dollars are calculated as of December 31, 2022.

(2) Accounting Changes and Recent Accounting Pronouncements

Accounting Changes

ASU 2016-13

In June 2016, the Financial Accounting Standards Board (the **FASB**) issued Accounting Standards Update (**ASU**) No. 2016-13, *Measurement of Credit Losses on Financial Statements (ASU 2016-13)*, which changes the recognition model for credit losses related to assets held at amortized cost. ASU 2016-13 eliminates the threshold that a loss must be considered probable to recognize a credit loss and instead requires an entity to reflect its current estimate of lifetime expected credit losses. We adopted ASU 2016-13 on January 1, 2020 on a modified retrospective basis by recording a cumulative effect adjustment of \$30.3 million to our accumulated earnings related to increases to our allowances for certain trade and notes receivable.

Recent Accounting Pronouncements

ASU 2022-04

In September 2022, the FASB issued ASU No. 2022-04, *Liabilities—Supplier Finance Programs (ASU 2022-04)*, which requires additional disclosures for buyers participating in supplier financing programs, which we refer to as vendor financing, including (i) the key terms of the arrangement, (ii) the confirmed amount outstanding at the end of the period, (iii) the balance sheet presentation of related amounts and (iv) a reconciliation of the balances from period to period. ASU 2022-04 is effective for annual reporting periods beginning after December 15, 2022, including interim periods within those fiscal years, with early adoption permitted. We do not expect ASU 2022-04 to have a significant impact on our consolidated financial statements. For additional information regarding our vendor financing obligations, see note 11.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2022, 2021 and 2020

ASU 2021-08

In October 2021, the FASB issued ASU No. 2021-08, *Accounting for Contract Assets and Contract Liabilities from Contracts with Customers (ASU 2021-08)*, which requires contract assets and contract liabilities acquired in a business combination to be recognized and measured in accordance with Topic 606, *Revenue from Contracts with Customers*, as if the acquirer had originated the contracts. ASU 2021-08 is effective for annual reporting periods beginning after December 15, 2022, including interim periods within those fiscal years, with early adoption permitted. The main impact of the adoption of ASU 2021-08 will be the recognition of contract assets and contract liabilities in future business combinations at amounts generally consistent with the carrying value of such assets and liabilities of the acquiree immediately before the acquisition date.

ASU 2020-04

In April 2020, the FASB issued ASU No. 2020-04, *Facilitation of the Effects of Reference Rate Reform on Financial Reporting (ASU 2020-04)*, which provides optional expedients and exceptions for contract modifications, subject to meeting certain criteria, that reference the London Interbank Offered Rate (**LIBOR**) or another reference rate expected to be discontinued. In accordance with the optional expedients in ASU 2020-04, we modified certain debt agreements during 2022 to replace LIBOR with another reference rate and applied the practical expedient to account for the modification as a continuation of the existing contract. The use of optional expedients in ASU 2020-04 has not had a significant impact on our consolidated financial statements to date. For additional information regarding our debt, see note 11.

(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, deferred income taxes and related valuation allowances, loss contingencies, fair value measurements, impairment assessments, capitalization of internal costs associated with construction and installation activities and the development of internal-use software, 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 6, 10, 11 and 12.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2022, 2021 and 2020

Cash Flow Statement

For purposes of our consolidated statements of cash flows, operating-related expenses financed by an intermediary are treated as constructive operating cash outflows and constructive financing cash inflows when the intermediary settles the liability with the vendor as there is no actual cash outflow until we pay the financing intermediary. When we pay the financing intermediary, we record financing cash outflows in our consolidated statements of cash flows. The capital expenditures we report in our consolidated statements of cash flows do not include amounts that are financed under capital-related vendor financing or finance lease arrangements. Instead, these amounts are reflected as non-cash additions to our property and equipment when the underlying assets are delivered, and as repayments of debt when the principal is repaid.

Trade Receivables

Our trade receivables are reported net of an allowance for doubtful accounts. Such allowance aggregated \$43.1 million and \$42.0 million at December 31, 2022 and 2021, 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, net, in our consolidated statements of operations. All costs directly associated with the acquisition of an investment to be accounted for using the fair value method are expensed as incurred. In addition, any interest received on our debt securities is reported as interest income in our consolidated statements of operations. Under the equity method, investments are recorded at cost and are subsequently increased or reduced to reflect our share of net earnings or losses of the investee. All costs directly associated with the acquisition of an investment to be accounted for using the equity method are included in the carrying amount of the investment. For additional information regarding our fair value and equity method investments, see notes 7 and 9.

Under the equity method, investments, originally recorded at cost, are adjusted to recognize our share of net earnings or losses of the affiliates as they occur rather than as dividend 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.

Dividend distributions 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. Dividend distributions from our equity method investees and all of our privately-held investees are reflected as reductions in the carrying values of the applicable investments. Dividend distributions 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.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2022, 2021 and 2020

We continually review all of our equity method investments to determine whether a decline in fair value below the cost basis is deemed other-than-temporary. The primary factors we consider in our determination are the extent and length of time that the fair value of the investment is below our company's carrying value and the financial condition, operating performance and near-term prospects of the investee, changes in the stock price or valuation subsequent to the balance sheet date, and the impacts of exchange rates, if applicable. If the decline in fair value of an equity method investment is deemed to be other-than-temporary, the cost basis of the security is written down to fair value and the corresponding charge is reported in share of results of affiliates, net, in our consolidated statements of operations.

Realized gains and losses are determined on an average cost basis. Securities transactions are recorded on the trade date.

Financial Instruments

Due to the short maturities of cash and cash equivalents, restricted cash, short-term liquid investments, trade and other receivables, other current assets, accounts payable and other accrued and current liabilities, their respective carrying values approximate their respective fair values. For information concerning the fair values of certain of our investments, derivatives and debt, see notes 7, 8 and 11, respectively. For information regarding how we arrive at certain of our fair value measurements, see note 9.

Derivative Instruments

All derivative instruments, whether designated as hedging relationships or not, are recorded on the balance sheet at fair value. We generally do not apply hedge accounting to our derivative instruments, therefore changes in the fair value of derivative instruments are recognized in earnings or loss.

The net cash received or paid related to our derivative instruments is classified as an operating, investing or financing activity in our consolidated statements of cash flows based on the objective of the derivative instrument and the classification of the applicable underlying cash flows. For additional information regarding our derivative instruments, see note 8.

Property and Equipment

Property and equipment are stated at cost less accumulated depreciation. We capitalize costs associated with the construction of new, or upgrades to existing, fixed and mobile transmission and distribution facilities, the installation of new fixed-line services and the development of internal-use software. Capitalized construction and installation costs include materials, labor and other directly attributable costs. Installation activities that are capitalized include (i) the initial connection (or drop) from our fixed-line system to a customer location, (ii) the replacement of a drop and (iii) the installation of equipment for new, or upgrades to existing, fixed-line services. The costs of other customer-facing activities, such as reconnecting and disconnecting customer locations and repairing or maintaining drops, are expensed as incurred. Interest capitalized with respect to construction activities was not material during any of the periods presented.

Capitalized internal-use software is included as a component of property and equipment. We capitalize internal and external costs directly associated with the development of internal-use software. We also capitalize costs associated with the purchase of software licenses. Maintenance and training costs, as well as costs incurred during the preliminary stage of an internal-use software development project, are expensed as incurred.

Depreciation is computed using the straight-line method over the estimated useful life of the underlying asset. Equipment under finance leases is amortized on a straight-line basis over the shorter of the lease term or estimated useful life of the asset. Useful lives used to depreciate our property and equipment are assessed periodically and are adjusted when warranted. The useful lives of fixed and mobile distribution systems that are undergoing a rebuild are adjusted such that property and equipment to be retired will be fully depreciated by the time the rebuild is completed. For additional information regarding the useful lives of our property and equipment, see note 10.

Additions, replacements and improvements that extend the asset life are capitalized. Repairs and maintenance are charged to operations.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2022, 2021 and 2020

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, 2022 and 2021, the recorded value of our asset retirement obligations was \$93.0 million and \$77.1 million, respectively.

Intangible Assets

Our primary intangible assets relate to goodwill and customer relationships. Goodwill represents the excess purchase price over the fair value of the identifiable net assets acquired in a business combination. Customer relationships are initially recorded at their fair value in connection with business combinations.

Goodwill and other intangible assets with indefinite useful lives are not amortized, but instead are tested for impairment at least annually. Intangible assets with finite lives are amortized on a straight-line basis over their respective estimated useful lives to their estimated residual values.

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

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) 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 for impairment at least annually on October 1 and whenever facts and circumstances indicate that a reporting unit's carrying amount may not be recoverable. We first make a qualitative assessment to determine if the goodwill may be impaired. 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").

Leases

For leases with a term greater than 12 months, we recognize on the lease commencement date (i) right-of-use (**ROU**) assets representing our right to use an underlying asset and (ii) lease liabilities representing our obligation to make lease payments over the lease term. Lease and non-lease components in a contract are generally accounted for separately.

We initially measure lease liabilities at the present value of the remaining lease payments over the lease term. Options to extend or terminate the lease are included only when it is reasonably certain that we will exercise that option. As most of our leases do not provide enough information to determine an implicit interest rate, we generally use a portfolio level incremental borrowing rate in our present value calculation. We initially measure ROU assets at the value of the lease liability, plus any initial direct costs and prepaid lease payments, less any lease incentives received.

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With respect to our finance leases, (i) ROU assets are generally depreciated on a straight-line basis over the shorter of the lease term or the useful life of the asset and (ii) interest expense on the lease liability is recorded using the effective interest method. Operating lease expense is recognized on a straight-line basis over the lease term. For leases with a term of 12 months or less (short-term leases), we do not recognize ROU assets or lease liabilities. Short-term lease expense is recognized on a straight-line basis over the lease term.

Income Taxes

Income taxes are accounted for under the asset and liability method. We recognize deferred tax assets and liabilities for the future tax consequences attributable to differences between the financial statement carrying amounts and income tax basis of assets and liabilities and the expected benefits of utilizing net operating loss and tax credit carryforwards, using enacted tax rates in effect for each taxing jurisdiction in which we operate for the year in which those temporary differences are expected to be recovered or settled. We recognize the financial statement effects of a tax position when it is more-likely-than-not, based on technical merits, that the position will be sustained upon examination. Net deferred tax assets are then reduced by a valuation allowance if we believe it is more-likely-than-not such net deferred tax assets will not be realized. Certain of our valuation allowances and tax uncertainties are associated with entities that we acquired in business combinations. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in earnings or loss in the period that includes the enactment date. Deferred tax liabilities related to investments in foreign subsidiaries and foreign corporate joint ventures that are essentially permanent in duration are not recognized until it becomes apparent that such amounts will reverse in the foreseeable future. In order to be considered essentially permanent in duration, sufficient evidence must indicate that the foreign subsidiary has invested or will invest its undistributed earnings indefinitely, or that earnings will be remitted in a tax-free manner. The 2017 Tax Cuts and Jobs Act created a requirement that certain income earned by foreign subsidiaries, known as global intangible low-taxed income (**GILTI**), must be included in the gross income of their U.S. shareholder. We have elected to treat the tax effect of GILTI as a current-period expense when incurred. Interest and penalties related to income tax liabilities are included in income tax benefit or expense in our consolidated statements of operations.

For additional information regarding our income taxes, see note 13.

Foreign Currency Translation and Transactions

The reporting currency of our company is the U.S. dollar. The functional currency of our foreign operations generally is the applicable local currency for each foreign subsidiary and equity method investee. Assets and liabilities of foreign subsidiaries (including intercompany balances for which settlement is not anticipated in the foreseeable future) are translated at the spot rate in effect at the applicable reporting date. With the exception of certain material transactions, the amounts reported in our consolidated statements of operations are translated at the average exchange rates in effect during the applicable period. The resulting unrealized cumulative translation adjustment, net of applicable income taxes, is recorded as a component of accumulated other comprehensive earnings or loss in our consolidated statements of equity. With the exception of certain material transactions, the cash flows from our operations in foreign countries are translated at the average rate for the applicable period in our consolidated statements of cash flows. The impacts of material transactions generally are recorded at the applicable spot rates in our consolidated statements of operations and cash flows. The effect of exchange rates on cash balances held in foreign currencies are separately reported in our consolidated statements of cash flows.

Transactions denominated in currencies other than our or our subsidiaries' functional currencies are recorded based on exchange rates at the time such transactions arise. Changes in exchange rates with respect to amounts recorded on our consolidated balance sheets related to these non-functional currency transactions result in transaction gains and losses that are reflected in our consolidated statements of operations as unrealized (based on the applicable period end exchange rates) or realized upon settlement of the transactions.

Revenue Recognition

Service Revenue — Fixed Networks. We recognize revenue from the provision of broadband internet, video and fixed-line telephony services over our network to customers in the period the related services are provided, with the exception of revenue recognized pursuant to certain contracts that contain promotional discounts, as described below. Installation fees related to services provided over our network are generally deferred and recognized as revenue over the contractual period, or longer if the upfront fee results in a material renewal right.

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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.

Other Revenue — Services to Affiliates. We provide certain services to the VMO2 JV and the VodafoneZiggo JV, which consist primarily of (i) technology and other services and (ii) capital-related expenditures for assets that will be used by or will otherwise benefit the VMO2 JV and the VodafoneZiggo JV. We recognize revenue from services to affiliates in the period in which the related services are provided.

Contract Costs. Incremental costs to obtain a contract with a customer, such as incremental sales commissions, are generally recognized as assets and amortized to SG&A expenses over the applicable period benefited, which generally is the contract life. If, however, the amortization period is less than one year, we expense such costs in the period incurred. Contract fulfillment costs, such as costs for installation activities for B2B customers, are recognized as assets and amortized to other operating costs over the applicable period benefited, which is generally the substantive contract term for the related service contract.

Promotional Discounts. For subscriber promotions, such as discounted or free services during an introductory period, revenue is recognized uniformly over the contractual period if the contract has substantive termination penalties. If a contract does not have substantive termination penalties, revenue is recognized only to the extent of the discounted monthly fees charged to the subscriber, if any.

Subscriber Advance Payments. Payments received in advance for the services we provide are deferred and recognized as revenue when the associated services are provided.

Sales, Use and Other Value-Added Taxes. Revenue is recorded net of applicable sales, use and other value-added taxes (VAT).

For additional information regarding our revenue recognition and related costs, see note 4. For additional information regarding services provided to our affiliates, see note 7. For a disaggregation of our revenue by major category and by reportable and geographic segment, see note 19.

Programming Costs

Programming costs include (i) agreements to distribute channels to our customers, (ii) exhibition rights of programming content and (iii) sports rights.

Channel Distribution Agreements. Our channel distribution agreements are generally multi-year contracts for which we are charged either (i) variable rates based upon the number of subscribers or (ii) on a flat fee basis. Certain of our variable rate contracts require minimum guarantees. Programming costs under such arrangements are recorded in operating costs and expenses in our consolidated statement of operations when the programming is available for viewing.

Exhibition Rights. Our agreements for exhibition rights are generally multi-year license agreements for which we are typically charged either (i) a percentage of the revenue earned per program or (ii) a flat fee per program. The current and long-term portions of our exhibition rights acquired under licenses are recorded as other current assets and other assets, net, respectively, on our consolidated balance sheet when the license period begins and the program is available for its first showing. Capitalized exhibition rights are amortized based on the projected future showings of the content using a straight-line or accelerated method of amortization, as appropriate. Exhibition rights are regularly reviewed for impairment and held at the lower of unamortized cost or estimated net realizable value.

Sports Rights. Our sports rights agreements are generally multi-year contracts for which we are typically charged a flat fee per season. We typically pay for sports rights in advance of the respective season. The current and long-term portions of any payments made in advance of the respective season are recorded as other current assets and other assets, net, respectively, on our consolidated balance sheet and are amortized on a straight-line basis over the respective sporting season. Sports rights are regularly reviewed for impairment and held at the lower of unamortized cost or estimated net realizable value.

For additional information regarding our programming costs, see note 18.

Share-based Compensation

We recognize all share-based payments to employees, including grants of employee share-based incentive awards, based on their grant-date fair values and our estimates of forfeitures. We recognize share-based compensation expense as a charge to operations over the vesting period based on the grant-date fair value of outstanding awards, which may differ from the fair value of such awards on any given date. Our share of payroll taxes incurred in connection with the vesting or exercise of our share-based incentive awards is recorded as a component of share-based compensation expense in our consolidated statements of operations.

We use the straight-line method to recognize share-based compensation expense for our outstanding share awards that do not contain a performance condition and the accelerated expense attribution method for our outstanding share awards that contain a performance condition and vest on a graded basis.

The grant date fair values for options, share appreciation rights (**SARs**) and performance-based share appreciation rights (**PSARs**) are estimated using the Black-Scholes option pricing model, and the grant date fair values for restricted share units (**RSUs**), restricted share awards (**RSAs**) and performance-based restricted share units (**PSUs**) are based upon the closing share price of Liberty Global ordinary shares on the date of grant. We consider historical exercise trends in our calculation of the expected life of options and SARs granted by Liberty Global to employees. The expected volatility for options and SARs related to our ordinary shares is generally based on a combination of (i) historical volatilities for a period equal to the expected average life of the awards and (ii) volatilities implied from publicly-traded options for our shares.

We generally issue new Liberty Global ordinary shares when Liberty Global options or SARs are exercised, when RSUs and PSUs vest and when RSAs are granted. Our company settles SARs and PSARs on a net basis when exercised by the award holder, whereby the number of shares issued represents the excess value of the award based on the market price of the respective Liberty Global shares at the time of exercise relative to the award's exercise price. In addition, the number of shares issued is further reduced by the amount of the employee's required income tax withholding.

Although we repurchase Liberty Global ordinary shares from time to time, the parameters of our share purchase and redemption activities are not established with reference to the dilutive impact of our share-based compensation plans.

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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 earnings (loss) from continuing operations attributable to Liberty Global shareholders are set forth below:

	Year ended December 31,		
	2022	2021	2020
in millions, except share amounts			
Earnings (loss) from continuing operations	\$ 1,105.3	\$ 13,527.5	\$ (1,525.1)
Net earnings from continuing operations attributable to noncontrolling interests	(513.1)	(183.3)	(161.3)
Net earnings (loss) from continuing operations attributable to Liberty Global shareholders	<u>\$ 592.2</u>	<u>\$ 13,344.2</u>	<u>\$ (1,686.4)</u>
Weighted average ordinary shares outstanding (basic EPS computation)	489,555,582	555,695,224	602,083,910
Incremental shares attributable to the assumed exercise of outstanding options and SARs and the release of RSUs, RSAs and PSUs upon vesting (treasury stock method)	7,433,268	13,418,999	—
Weighted average ordinary shares outstanding (diluted EPS computation)	<u>496,988,850</u>	<u>569,114,223</u>	<u>602,083,910</u>

The calculation of diluted earnings per share during 2022 and 2021 excludes a total of 59.5 million and 47.9 million options, SARs and RSUs, respectively, because their effect would have been anti-dilutive.

We reported losses from continuing operations attributable to Liberty Global shareholders during 2020. Therefore, the potentially dilutive effect at December 31, 2020 of the following items were not included in the computation of diluted loss from continuing operations attributable to Liberty Global shareholders per share because their inclusion would have been anti-dilutive to the computation or, in the case of certain PSARs and PSUs, because such awards had not yet met the applicable performance criteria: (i) the aggregate number of shares issuable pursuant to outstanding options, SARs, RSUs and RSAs of 76.1 million and (ii) the aggregate number of shares issuable pursuant to PSARs and PSUs of 18.4 million.

(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 \$33.3 million and \$29.7 million as of December 31, 2022 and 2021, 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 \$272.5 million and \$286.5 million as of December 31, 2022 and 2021,

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respectively. The decrease in deferred revenue during 2022 is primarily due to the net effect of (a) the recognition of \$217.1 million of revenue that was included in our deferred revenue balance at December 31, 2021 and (b) the impact of additions during the period. The long-term portions of our deferred revenue balances are included within other long-term liabilities on our consolidated balance sheets.

Contract Costs

Our aggregate assets associated with incremental costs to obtain and fulfill our contracts were \$69.4 million and \$63.4 million at December 31, 2022 and 2021, 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 2022, 2021 and 2020, we amortized \$16.0 million, \$81.3 million and \$113.2 million, respectively, to operating costs and expenses associated with these assets.

Unsatisfied Performance Obligations

A large portion of our revenue is derived from customers who are not subject to contracts. Revenue from customers who are subject to contracts is generally recognized over the term of such contracts, which is typically 12 months for our residential service contracts, one to three years for our mobile service contracts and one to five years for our B2B service contracts.

(5) Acquisitions

Pending Transaction

Telenet NetCo Transaction. On July 19, 2022, Telenet and Fluvius System Operator CV (**Fluvius**) entered into an agreement to create an independent, self-funding infrastructure company (**NetCo**) within their combined geographic footprint in Belgium. The companies will each contribute certain cable infrastructure assets with Telenet and Fluvius initially owning 66.8% and 33.2% of NetCo, respectively. Telenet and Liberty Global will consolidate NetCo upon closing of the transaction, which we currently expect to occur in mid-2023. The closing of the transaction is subject to the satisfaction of certain conditions, including regulatory conditions and approval from Fluvius shareholders.

2020 Acquisition

Sunrise Acquisition. On November 11, 2020, we completed the acquisition of Sunrise Communications Group AG (**Sunrise**) (the **Sunrise Acquisition**). The Sunrise Acquisition was effected through an all cash public tender offer of the outstanding shares of Sunrise (the **Sunrise Shares**) for CHF 110 (\$120 at the transaction date) per share, for a total purchase price of CHF 5.0 billion (\$5.4 billion at the transaction date). In April 2021, we completed a statutory “squeeze-out” procedure, under applicable Swiss law, to acquire the remaining Sunrise Shares that were not acquired pursuant to the tender offer and, accordingly, we now hold 100% of the share capital of Sunrise.

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We have accounted for the Sunrise Acquisition using the acquisition method of accounting, whereby the total purchase price was allocated to the acquired identifiable net assets of Sunrise based on assessments of their respective fair values, and the excess of the purchase price over the fair values of these identifiable net assets was allocated to goodwill. A summary of the purchase price and the opening balance sheet of Sunrise at the November 11, 2020 acquisition date is presented in the following table. The opening balance sheet presented below reflects our final purchase price allocation (in millions):

Cash and cash equivalents	\$ 108.5
Trade receivables, net	484.2
Other current assets	148.3
Property and equipment, net	1,541.4
Goodwill (a)	3,436.0
Intangible assets subject to amortization, net	2,485.8
Operating lease ROU assets	1,047.1
Other assets, net	232.3
Current portion of debt and finance lease obligations	(133.2)
Current operating lease liabilities	(136.5)
Other accrued and current liabilities	(531.5)
Long-term debt and finance lease obligations	(1,762.5)
Long-term operating lease liabilities	(877.6)
Other long-term liabilities	(614.5)
Total purchase price (b)	\$ 5,427.8

- (a) The goodwill recognized in connection with the Sunrise Acquisition is primarily attributable to (i) the opportunity to leverage Sunrise's existing mobile network to gain immediate access to potential customers and (ii) estimated synergy benefits through the integration of Sunrise with our existing operations in Switzerland.
- (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.

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. 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. The unaudited pro forma consolidated operating results for the year ended December 31, 2020 are summarized below:

Revenue (in millions)	\$ 13,206.8
Net loss from continuing operations attributable to Liberty Global shareholders (in millions)	\$ (1,902.3)
Basic and diluted loss from continuing operations attributable to Liberty Global shareholders per share	\$ (3.16)

Our consolidated statement of operations for the year ended December 31, 2020 includes revenue and net loss of \$314.0 million and \$15.4 million, respectively, attributable to Sunrise.

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(6) Dispositions

2022 Dispositions

UPC Poland

On April 1, 2022, we completed the sale of 100% of our operations in Poland (**UPC Poland**) to a subsidiary of iliad S.A. (**iliad**). After considering debt and working capital adjustments (including cash disposed), we received net cash proceeds of Polish zloty 6,520.4 million (\$1,553.3 million at the transaction date). A portion of the net proceeds from the sale, after reflecting the impact of derivative settlements, was used to repurchase certain of UPC Holding's outstanding indebtedness, with the remainder available for general corporate purposes. For additional information regarding these financing transactions, see note 11.

In connection with the sale of UPC Poland, we recognized a gain of \$846.4 million, which includes a cumulative foreign currency translation gain of \$10.9 million. No income taxes were required to be provided on this gain.

In connection with the sale of UPC Poland, we have agreed to provide certain transitional services to iliad for a period of up to five years, depending on the service. These services principally comprise network and information technology-related functions. The annual charges will depend on the actual level of services required by the purchaser. During 2022, we recorded revenue of \$26.6 million associated with these transitional services.

UPC Poland is presented as a discontinued operation in our consolidated financial statements for all applicable periods. Effective with the signing of the sale and purchase agreement on September 22, 2021, we ceased to depreciate or amortize the associated long-lived assets. Our operations in Poland were held through UPC Holding prior to the disposal date. No debt, interest or derivative instruments of the UPC Holding borrowing group have been allocated to discontinued operations. Prior to being presented as a discontinued operation, the operations of UPC Poland were included in our former "Central and Eastern Europe" reportable segment.

The carrying amounts of the major classes of assets and liabilities of UPC Poland as of December 31, 2021 are summarized in the following table (in millions):

Assets:	
Current assets	\$ 23.4
Property and equipment, net	406.8
Goodwill	464.7
Other assets, net	30.1
Total assets	<u>\$ 925.0</u>
Liabilities:	
Current portion of debt and finance lease obligations	\$ 42.7
Other accrued and current liabilities	97.3
Long-term debt and finance lease obligations	5.0
Other long-term liabilities	56.3
Total liabilities	<u>\$ 201.3</u>

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The operating results of UPC Poland for 2022, 2021 and 2020 are summarized in the following table. These amounts exclude intercompany revenue and expenses that are eliminated within our consolidated statements of operations.

	Year ended December 31,		
	2022 (a)	2021	2020
	in millions		
Revenue	\$ 109.5	\$ 454.8	\$ 434.7
Operating income	\$ 45.0	\$ 133.7	\$ 86.9
Earnings before income taxes	\$ 43.9	\$ 130.7	\$ 77.4
Income tax expense	(9.3)	(48.1)	(19.0)
Net earnings attributable to Liberty Global shareholders	\$ 34.6	\$ 82.6	\$ 58.4

(a) Includes the operating results of UPC Poland from January 1, 2022 through April 1, 2022, the date UPC Poland was sold.

Telenet Tower Sale

On June 1, 2022, Telenet completed the sale of substantially all of their passive infrastructure and tower assets to DigitalBridge Investments LLC (**DigitalBridge**) (the **Telenet Tower Sale**). After considering working capital adjustments, we received net cash proceeds of €733.0 million (\$779.9 million at the transaction date). Effective with the signing of the sale and purchase agreement on March 25, 2022, we began accounting for the associated assets and liabilities as held for sale and, accordingly, we ceased to depreciate or amortize these long-lived assets.

In connection with the completion of the Telenet Tower Sale, we recognized a gain of \$700.5 million. No income taxes were required to be provided on this gain.

As part of the Telenet Tower Sale, Telenet entered into a master lease agreement to lease back the passive infrastructure and tower assets from DigitalBridge for an initial period of 15 years (the **Telenet Tower Lease Agreement**). In connection with the Telenet Tower Lease Agreement, we recorded non-cash additions to our operating lease ROU assets of \$615.1 million and a corresponding increase to our operating lease liabilities of the same amount.

In addition, as part of the Telenet Tower Lease Agreement, Telenet has also committed to lease back 475 build-to-suit sites over the term of the lease. As of December 31, 2022, the total U.S. dollar equivalent of the estimated future payments for the build-to-suit sites over the term of the lease was \$121.0 million, the majority of which are due after 2027. Telenet will act as an agent over the construction of future towers on the build-to-suit sites.

2021 Dispositions

U.K. JV Transaction

On June 1, 2021, pursuant to a Contribution Agreement dated May 7, 2020 (the **Contribution Agreement**) with, among others, Telefónica, (i) we contributed Virgin Media's U.K. operations and certain other Liberty Global subsidiaries (together, the **U.K. JV Entities**) to the VMO2 JV and (ii) Telefónica contributed its U.K. mobile business to the VMO2 JV, creating a nationwide integrated communications provider (herein referred to as the "**U.K. JV Transaction**"). We account for our 50% interest in the VMO2 JV as an equity method investment, as further described in note 7.

In connection with the U.K. JV Transaction, we received net cash of \$108.6 million, which includes the net impact of (i) equalization payments received from Telefónica, (ii) our share of the proceeds associated with related recapitalization financing transactions completed by the VMO2 JV and (iii) \$44.5 million of cash paid by Liberty Global to settle certain centrally-held vendor financing obligations associated with the VMO2 JV.

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In connection with the U.K. JV Transaction, we recognized a pre-tax gain of \$10,873.8 million, net of the recognition of a cumulative foreign currency translation loss of \$1,198.6 million. This gain was calculated by deducting the carrying value of the U.K. JV Entities (including the related foreign currency translation loss) from the sum of (i) the fair value assigned to our 50% interest in the VMO2 JV and (ii) the net cash received pursuant to the equalization payments and recapitalization transactions described above. For information regarding our approach to the valuation of our interest in the VMO2 JV, see note 9.

A summary of the fair value of the assets and liabilities of the VMO2 JV at the June 1, 2021 transaction date is presented in the following table. The opening balance sheet presented below reflects the final purchase price allocation (in millions):

Current assets	\$	4,186.7
Property and equipment, net		12,523.2
Goodwill		29,455.4
Intangible assets subject to amortization, net		13,274.6
Other assets, net		4,163.5
Current portion of debt and finance lease obligations		(4,352.5)
Other accrued and current liabilities		(5,780.8)
Long-term debt and finance lease obligations		(21,879.2)
Other long-term liabilities		(2,170.9)
Total fair value of the net assets of the VMO2 JV	\$	<u>29,420.0</u>

For periods prior to the June 1, 2021 completion of the U.K. JV Transaction, our consolidated statements of operations include aggregate earnings before income taxes attributable to the U.K. JV Entities of \$890.5 million and \$566.2 million during 2021 and 2020, respectively.

Effective with the signing of the Contribution Agreement, we began accounting for the U.K. JV Entities as held for sale. Accordingly, we ceased to depreciate or amortize the long-lived assets of the U.K. JV Entities. However, the U.K. JV Entities were not presented as discontinued operations as the U.K. JV Transaction did not represent a strategic shift as defined by GAAP.

The June 1, 2021 carrying amounts of the major classes of assets and liabilities associated with the U.K. JV Entities, which were contributed to the VMO2 JV, are summarized below (in millions):

Assets:		
Current assets (a)	\$	4,868.3
Property and equipment, net		9,465.1
Goodwill		8,214.7
Other assets, net		3,086.9
Total assets (b)	\$	<u>25,635.0</u>
Liabilities:		
Current portion of debt and finance lease obligations	\$	3,220.9
Other accrued and current liabilities		2,242.0
Long-term debt and finance lease obligations		16,905.1
Other long-term liabilities		1,788.2
Total liabilities (b)	\$	<u>24,156.2</u>

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-
- (a) Amount includes \$3.4 billion of net proceeds from certain financing transactions completed in 2020 that were held in escrow pending the completion of the U.K. JV Transaction.
- (b) The carrying amount of the net assets of \$1,478.8 million presented above is net of the cumulative foreign currency translation loss of \$1,198.6 million.

AtlasEdge JV Transactions

On September 1, 2021, we (i) contributed certain assets and liabilities to a newly-formed 50:50 joint venture (the **AtlasEdge JV**) that was established for the purpose of acquiring and commercializing European technical real estate for edge colocation and hosting services and (ii) sold certain other assets to the AtlasEdge JV. In addition, we sold certain additional assets to the AtlasEdge JV during the fourth quarter of 2021. In connection with these transactions, which we collectively refer to as the “**AtlasEdge JV Transactions**”, we (a) received net cash of \$144.5 million and (b) recognized a pre-tax gain of \$227.5 million (net of the recognition of a cumulative foreign currency translation loss of \$1.8 million), representing the difference between the estimated fair value and the carrying value of the net assets associated with these transactions. We account for our interest in the AtlasEdge JV as an equity method investment.

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(7) Investments

The details of our investments are set forth below:

<u>Accounting Method</u>	December 31,		Ownership (a)
	2022	2021	
	in millions		
Equity (b):			
Long-term:			
VMO2 JV	\$ 9,790.9	\$ 13,774.7	50.0
VodafoneZiggo JV (c)	2,345.8	2,572.4	50.0
All3Media Group (All3Media)	143.9	143.7	50.0
AtlasEdge JV	122.2	163.7	47.5
Formula E Holdings Ltd (Formula E)	87.3	115.9	35.9
Other	187.0	174.8	
Total — equity	12,677.1	16,945.2	
Fair value:			
Short-term:			
Separately-managed accounts (SMA s) (d)	2,621.6	2,269.6	
Long-term:			
Televisa Univision, Inc. (Televisa Univision) (e)	385.5	385.5	6.3
ITV plc (ITV)	362.4	596.3	9.9
Lacework, Inc. (Lacework)	242.8	269.1	3.3
SMA s (d)	233.0	531.7	
EdgeConneX, Inc. (EdgeConneX)	183.8	138.7	5.2
Plume Design, Inc. (Plume)	154.0	188.8	11.5
Pax8, Inc. (Pax8)	99.0	14.7	5.9
Aviatrix Systems, Inc. (Aviatrix)	78.2	78.2	3.8
CANAL+ Polska S.A. (CANAL+ Polska)	66.1	70.8	17.0
Lions Gate Entertainment Corp. (Lionsgate)	36.7	105.9	2.9
Other	337.5	378.1	
Total — fair value	4,800.6	5,027.4	
Total investments (f)	\$ 17,477.7	\$ 21,972.6	
Short-term investments	\$ 2,621.6	\$ 2,269.6	
Long-term investments	\$ 14,856.1	\$ 19,703.0	

(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 dividend distributions are received, with our recognition of losses generally limited to the extent of our investment in, and loans and commitments to, the investee. Accordingly, the carrying values of our equity method investments may not equal the respective fair values. At December 31, 2022 and 2021, the aggregate carrying amounts of our equity method investments exceeded our proportionate share of the respective investee's net assets by \$1,196.8 million and \$1,236.0 million, respectively, which primarily includes amounts associated with the VodafoneZiggo JV Receivables, as defined below, and amounts we are owed under a long-term note receivable from All3Media.

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- (c) Amounts include certain notes receivable due from a subsidiary of the VodafoneZiggo JV to a subsidiary of Liberty Global comprising (i) a euro-denominated note receivable with a principal amount of \$749.7 million and \$797.1 million at December 31, 2022 and 2021, respectively, (the **VodafoneZiggo JV Receivable I**) and (ii) a euro-denominated note receivable with a principal amount of \$222.7 million and \$236.7 million at December 31, 2022 and 2021, respectively, (the **VodafoneZiggo JV Receivable II** and, together with the VodafoneZiggo JV Receivable I, the **VodafoneZiggo JV Receivables**). During 2021, an additional \$123.0 million was loaned under the VodafoneZiggo JV Receivable II to fund the VodafoneZiggo JV's final installment of spectrum license fees due to the Dutch government. The VodafoneZiggo JV Receivables bear interest at 5.55% and have a final maturity date of December 31, 2030. During 2022, interest accrued on the VodafoneZiggo JV Receivables was \$53.8 million, all of which has been cash settled.
- (d) Represents investments held under SMAs, which are maintained by investment managers acting as agents on our behalf. We classify, measure and report these investments, the composition of which may change from time to time, based on the underlying nature and characteristics of each security held under the SMAs. As of December 31, 2022, all of our investments held under SMAs were classified as available-for-sale debt securities, as further described in note 3. At December 31, 2022 and 2021, interest accrued on our debt securities, which is included in other current assets on our consolidated balance sheets, was \$18.5 million and \$5.1 million, respectively.
- (e) At December 31, 2022, the fair value of our investment in Televisa Univision reflects the merger of Univision Holdings Inc. and Grupo Televisa, S.A.B., which was completed during the first quarter of 2022.
- (f) The purchase and sale of investments are presented on a gross basis in our consolidated statements of cash flows, including amounts associated with SMAs.

Equity Method Investments

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

	Year ended December 31,		
	2022	2021	2020
	in millions		
VMO2 JV (a)	\$ (1,396.6)	\$ (97.2)	\$ —
VodafoneZiggo JV (b)	241.2	(32.0)	(201.1)
Streamz B.V. (Streamz) (c)	(35.2)	(0.7)	(2.3)
Eltrona Interdiffusion S.A. (Eltrona) (d)	(34.2)	(17.2)	1.3
AtlasEdge JV	(23.3)	(5.8)	—
Formula E	(20.2)	(2.5)	(8.4)
All3Media	(10.0)	(17.4)	(27.9)
Other	10.5	(2.6)	(6.9)
Total	<u>\$ (1,267.8)</u>	<u>\$ (175.4)</u>	<u>\$ (245.3)</u>

- (a) Represents (i) our 50% share of the results of operations of the VMO2 JV and (ii) 100% of the share-based compensation expense associated with Liberty Global awards granted to VMO2 JV employees who were formerly employees of Liberty Global prior to the VMO2 JV formation, as these awards remain our responsibility. The 2022 amount includes a charge of \$1.8 billion, representing our 50% share of the VMO2 JV's goodwill impairment, as described below.
- (b) Represents (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.
- (c) The 2022 amount includes a charge of \$31.7 million related to a decline in fair value below the cost basis of the investment that was deemed other-than-temporary during the fourth quarter.

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- (d) The 2022 amount includes a charge of \$32.5 million related to a decline in fair value below the cost basis of the investment that was deemed other-than-temporary during the fourth quarter.

VMO2 JV

On June 1, 2021, we completed the U.K. JV Transaction. Each of Liberty Global and Telefónica (each a “**U.K. JV Shareholder**”) holds 50% of the issued share capital of the VMO2 JV. The U.K. JV Shareholders intend for the VMO2 JV to be funded solely from its net cash flows from operations and third-party financing. We account for our 50% interest in the VMO2 JV as an equity method investment and consider the VMO2 JV to be a related party. For additional information regarding the U.K. JV Transaction, see note 6.

In connection with the formation of the VMO2 JV, the U.K. JV Shareholders entered into an agreement (the **U.K. JV Shareholders Agreement**) that contains customary provisions for the governance of a 50:50 joint venture and provides Liberty Global and Telefónica with joint control over decision making with respect to the VMO2 JV.

The U.K. JV Shareholders Agreement also provides (i) for a dividend distribution policy that requires the VMO2 JV to distribute all unrestricted cash to the U.K. JV Shareholders on a pro rata basis (subject to the VMO2 JV maintaining a minimum amount of cash and complying with the terms of its financing arrangements) and (ii) that the VMO2 JV will be managed with a leverage ratio between 4.0 and 5.0 times EBITDA (as calculated pursuant to its existing financing arrangements), with the VMO2 JV undertaking periodic recapitalizations and/or refinancings accordingly. During 2022, we received dividend distributions from the VMO2 JV aggregating \$932.5 million, of which \$477.9 million was accounted for as a return of capital and \$454.6 million was accounted for as a return on capital for purposes of our consolidated statements of cash flows. During 2021, we received a dividend distribution from the VMO2 JV of \$214.8 million, which was accounted for as a return on capital for purposes of our consolidated statement of cash flows.

Each U.K. JV Shareholder has the right to initiate an initial public offering (**IPO**) of the VMO2 JV after the third anniversary of the closing, with the opportunity for the other U.K. JV Shareholder to sell shares in the IPO on a pro rata basis. Subject to certain exceptions, the U.K. JV Shareholders Agreement prohibits transfers of interests in the VMO2 JV to third parties until the fifth anniversary of the closing. After the fifth anniversary, each U.K. JV Shareholder will be able to initiate a sale of all of its interest in the VMO2 JV to a third party and, under certain circumstances, initiate a sale of the entire VMO2 JV; subject, in each case, to a right of first offer in favor of the other U.K. JV Shareholder.

Pursuant to an agreement entered into in connection with the closing of the VMO2 JV (the **U.K. JV Framework Agreement**), Liberty Global provides certain services to the VMO2 JV on a transitional or ongoing basis (collectively, the **U.K. JV Services**). Pursuant to the terms of the U.K. JV Framework Agreement, the ongoing services will be provided for a period of two to six years depending on the type of service, while transitional services will be provided for a period of no less than 12 months, after which both parties shall be entitled to terminate based on specified notice periods. The U.K. JV Services provided by Liberty Global consist primarily of (i) technology and other services and (ii) capital-related expenditures for assets that will be used by or will otherwise benefit the VMO2 JV. Liberty Global charges both fixed and variable fees to the VMO2 JV for the U.K. JV Services it provides during the term of the U.K. JV Framework Agreement. We recorded revenue related to the U.K. JV Services of \$251.2 million and \$170.1 million during 2022 and 2021, respectively. At December 31, 2022 and 2021, \$37.0 million and \$43.3 million, respectively, was due from the VMO2 JV, primarily related to (a) services performed under the U.K. JV Framework Agreement and (b) amounts incurred by Liberty Global for certain equipment and licenses purchased on behalf of the VMO2 JV. The amounts due from the VMO2 JV, which are periodically cash settled, are included in other current assets on our consolidated balance sheets.

In July 2022, the VMO2 JV entered into a new long-term performance incentive plan (the **2022 VMO2 LTIP**) for certain of its employees, dependent on the achievement of specific performance metrics over each of the three years in the period beginning January 1, 2022 and ending on December 31, 2024. Payout may occur in March 2025 and will be settled in Liberty Global Class A and/or Liberty Global Class C ordinary shares and Telefónica ordinary shares, with the settlement split evenly between the U.K. JV Shareholders. Subject to forfeitures, 66.7% of each participant’s payout will be earned on January 1, 2024 with the remainder earned on December 31, 2024. The 2022 VMO2 LTIP awards are liability classified due to the fact that the final payout will be a fixed monetary amount settled in a variable number of shares. At December 31, 2022, the estimated fair value of Liberty Global’s share of the final payout under the 2022 VMO2 LTIP was \$10.9 million. As the VMO2 JV will reimburse the U.K. JV Shareholders in cash for the value of each company’s 50% payout of the 2022 VMO2 LTIP awards, a

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receivable from the VMO2 JV equal to the amount of the fair value of our share of the 2022 VMO2 LTIP liability is recorded on our consolidated balance sheet.

During the fourth quarter of 2022, in its U.S. GAAP financial statements, the VMO2 JV recorded a goodwill impairment of £3.1 billion (\$3.6 billion at the applicable rate) primarily related to (i) an increase in the weighted average cost of capital (discount rate) under a market participant view and (ii) the broader macroeconomic environment, including recent declines in comparable public company market valuations. Given the recency of the VMO2 JV's formation, the fair value of the business has been in close proximity to its carrying value and was estimated to be £33.3 billion (\$40.3 billion) at the measurement date. The VMO2 JV considered an income approach and a market approach in determining the fair value estimate. Significant judgment was involved in the assessment, including (a) market participant estimates of the discount rate and (b) current earnings multiples of comparable public companies. Our 50% share of the VMO2 JV's goodwill impairment charge is reported in share of results of affiliates, net, in our consolidated statement of operations.

The summarized results of operations of the VMO2 JV are set forth below:

	Year ended December 31,	
	2022	2021 (a)
in millions		
Revenue	\$ 12,857.2	\$ 8,522.9
Loss before income taxes	\$ (3,012.8)	\$ (351.6)
Net loss	\$ (3,042.0)	\$ (173.2)

(a) Includes the operating results of the VMO2 JV for the period from June 1, 2021 through December 31, 2021.

The summarized financial position of the VMO2 JV is set forth below:

	December 31,	
	2022	2021
in millions		
Current assets	\$ 4,056.0	\$ 4,733.3
Long-term assets	45,753.3	55,698.3
Total assets	\$ 49,809.3	\$ 60,431.6
Current liabilities	\$ 8,349.7	\$ 9,247.1
Long-term liabilities	21,877.6	23,595.6
Owners' equity	19,582.0	27,588.9
Total liabilities and owners' equity	\$ 49,809.3	\$ 60,431.6

VodafoneZiggo JV

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

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

The NL Shareholders Agreement also provides (i) for a dividend distribution policy that requires the VodafoneZiggo JV to distribute all unrestricted cash to the NL JV Shareholders every two months (subject to the VodafoneZiggo JV maintaining a

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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 2022, 2021 and 2020, we received dividend distributions from the VodafoneZiggo JV of \$266.6 million, \$311.7 million and \$249.5 million, respectively, which were accounted for as returns on capital for purposes of our consolidated statements of cash flows.

Each NL JV Shareholder has the right to initiate an IPO of the VodafoneZiggo JV, with the opportunity for the other NL JV Shareholder to sell shares in the IPO on a pro rata basis. As of January 1, 2021, each NL JV Shareholder has the right to initiate a sale of all of its interest in the VodafoneZiggo JV to a third party and, under certain circumstances, initiate a sale of the entire VodafoneZiggo JV, subject, in each case, to a right of first offer in favor of the other NL JV Shareholder.

Pursuant to an agreement (the **NL JV Framework Agreement**), Liberty Global provides certain services to the VodafoneZiggo JV (collectively, the **NL JV Services**). The NL JV Services provided by Liberty Global consist primarily of (i) technology and other services and (ii) capital-related expenditures for assets that will be used by, or will otherwise benefit, the VodafoneZiggo JV. Liberty Global charges both fixed and usage-based fees to the VodafoneZiggo JV for the NL JV Services provided during the term of the NL JV Framework Agreement. During 2022, 2021 and 2020, we recorded revenue from the VodafoneZiggo JV of \$263.9 million, \$222.0 million and \$178.9 million, respectively, primarily related to (a) the NL JV Services and (b) the sale of customer premises equipment (**CPE**) to the VodafoneZiggo JV at a mark-up. At December 31, 2022 and 2021, \$35.0 million and \$62.5 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,		
	2022	2021	2020
in millions			
Revenue	\$ 4,284.6	\$ 4,824.2	\$ 4,565.4
Earnings (loss) before income taxes	\$ 608.3	\$ (90.8)	\$ (287.2)
Net earnings (loss)	\$ 394.7	\$ (163.1)	\$ (448.7)

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

	December 31,	
	2022	2021
in millions		
Current assets	\$ 815.5	\$ 896.2
Long-term assets	19,396.4	20,392.3
Total assets	\$ 20,211.9	\$ 21,288.5
Current liabilities	\$ 2,719.2	\$ 2,744.3
Long-term liabilities	14,652.3	15,381.0
Owners' equity	2,840.4	3,163.2
Total liabilities and owners' equity	\$ 20,211.9	\$ 21,288.5

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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,		
	2022	2021	2020
in millions			
ITV	\$ (233.9)	\$ 15.3	\$ (217.1)
Pax8	79.3	—	—
Lionsgate	(69.2)	33.9	4.0
SMAs	(49.1)	(10.1)	5.2
EdgeConneX	43.4	28.9	33.1
Plume	(34.8)	133.9	29.6
Skillz Inc. (Skillz)	(34.7)	(100.4)	238.0
TiBiT Communications, Inc. (TiBiT) (a)	26.4	—	—
Lacework	(26.3)	223.9	1.1
Televisa Univision	23.1	301.6	—
Aviatrix	—	65.4	—
Other, net (b)	(26.3)	42.6	(58.1)
Total	<u>\$ (302.1)</u>	<u>\$ 735.0</u>	<u>\$ 35.8</u>

(a) Our investment in TiBiT was sold during the fourth quarter of 2022.

(b) The amounts in 2022 and 2021 include gains of \$15.7 million and \$12.9 million, respectively, related to investments that were sold during the year.

Debt Securities

At December 31, 2022 and 2021, all of our SMAs were composed of debt securities, which are summarized in the following tables:

	December 31, 2022		
	Amortized cost basis	Accumulated unrealized losses	Fair value
in millions			
Commercial paper	\$ 881.1	\$ 2.1	\$ 883.2
Government bonds	697.0	(1.4)	695.6
Certificates of deposit	520.5	(0.6)	519.9
Corporate debt securities	405.3	(4.8)	400.5
Other debt securities	355.0	0.4	355.4
Total debt securities	<u>\$ 2,858.9</u>	<u>\$ (4.3)</u>	<u>\$ 2,854.6</u>

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	December 31, 2021		
	Amortized cost basis	Accumulated unrealized losses	Fair value
	in millions		
Commercial paper	\$ 897.4	\$ —	\$ 897.4
Corporate debt securities	705.5	(1.6)	703.9
Government bonds	655.9	(3.3)	652.6
Certificates of deposit	355.5	(0.1)	355.4
Other debt securities	192.0	—	192
Total debt securities	<u>\$ 2,806.3</u>	<u>\$ (5.0)</u>	<u>\$ 2,801.3</u>

During 2022, 2021 and 2020, we received proceeds from the sale of debt securities of \$9.1 billion, \$6.1 billion and \$6.0 billion, respectively, the majority of which were reinvested in new debt securities held under SMAs. The sale of debt securities during 2022, 2021 and 2020 resulted in realized net gains (losses) of (\$6.9 million), (\$2.0 million) and \$2.0 million, respectively.

The fair values of our debt securities as of December 31, 2022 by contractual maturity are shown below (in millions):

Due in one year or less	\$ 2,621
Due in one to five years	231
Due in five to ten years	1
Total (a)	<u>\$ 2,854</u>

(a) The weighted average life of our total debt securities was 0.4 years as of December 31, 2022.

Our investment portfolio is subject to various macroeconomic pressures and has experienced significant volatility, which affects both our non-public and publicly-traded investments. Changes in the fair values of these investments, including changes with respect to interest rates within our local jurisdictions, are likely to continue and could be significant.

(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 (£) and the Swiss franc (CHF). 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.

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The following table provides details of the fair values of our derivative instrument assets and liabilities:

	December 31, 2022			December 31, 2021		
	Current	Long-term	Total	Current	Long-term	Total
in millions						
Assets (a):						
Cross-currency and interest rate derivative contracts (b)	\$ 381.4	\$ 1,087.6	\$ 1,469.0	\$ 214.9	\$ 164.3	\$ 379.2
Equity-related derivative instruments (c)	—	92.4	92.4	—	113.8	113.8
Foreign currency forward and option contracts	1.0	—	1.0	28.4	—	28.4
Other	0.3	—	0.3	1.0	—	1.0
Total	\$ 382.7	\$ 1,180.0	\$ 1,562.7	\$ 244.3	\$ 278.1	\$ 522.4
Liabilities (a):						
Cross-currency and interest rate derivative contracts (b)	\$ 286.5	\$ 449.0	\$ 735.5	\$ 208.8	\$ 670.2	\$ 879.0
Foreign currency forward and option contracts	10.3	1.3	11.6	13.0	—	13.0
Total	\$ 296.8	\$ 450.3	\$ 747.1	\$ 221.8	\$ 670.2	\$ 892.0

(a) Our long-term derivative assets and long-term derivative liabilities are included in 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 (\$16.6 million), (\$10.7 million) and \$336.0 million during 2022, 2021 and 2020, respectively. These amounts are included in realized and unrealized gains (losses) on derivative instruments, net, in our consolidated statements of operations. For further information regarding our fair value measurements, see note 9.

(c) Our equity-related derivative instruments include warrants on our investment in Plume.

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

	Year ended December 31,		
	2022	2021	2020
in millions			
Cross-currency and interest rate derivative contracts	\$ 1,185.5	\$ 578.9	\$ (1,184.3)
Foreign currency forward and option contracts	28.3	(31.8)	(81.1)
Equity-related derivative instruments:			
ITV Collar	—	(11.8)	364.2
Other	(21.4)	85.6	22.5
Total equity-related derivative instruments	(21.4)	73.8	386.7
Other	(0.7)	2.0	—
Total	\$ 1,191.7	\$ 622.9	\$ (878.7)

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The net cash received or paid related to our derivative instruments is classified as an operating, investing or financing activity in our consolidated statements of cash flows based on the objective of the derivative instrument and the classification of the applicable underlying cash flows. The following table sets forth the classification of the net cash inflows of our derivative instruments:

	Year ended December 31,		
	2022	2021	2020
	in millions		
Operating activities	\$ 75.3	\$ (22.5)	\$ (55.9)
Investing activities	40.9	(107.1)	(39.8)
Financing activities	(50.0)	143.6	129.1
Total	<u>\$ 66.2</u>	<u>\$ 14.0</u>	<u>\$ 33.4</u>

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, however notwithstanding, given the size of our derivative portfolio, the default of certain counterparties could have a significant impact on our consolidated statements of operations. Collateral is generally not posted by either party under our derivative instruments. At December 31, 2022, our exposure to counterparty credit risk included derivative assets with an aggregate fair value of \$922.5 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 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.

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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, 2022, 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, 2022:

	Notional amount due from counterparty		Notional amount due to counterparty		Weighted average remaining life
	in millions				in years
UPC Holding	\$	250.0	€	220.6	2.8
	\$	4,475.0	CHF	4,098.2 (a)	5.5
	€	2,650.0	CHF	2,970.1	3.1
	CHF	740.0	€	701.1	—
Telenet	\$	3,940.0	€	3,489.6 (a)	4.1
	€	45.2	\$	50.0 (b)	2.1

(a) Includes certain derivative instruments that are “forward-starting,” such that the initial exchange occurs at a date subsequent to December 31, 2022. These instruments are typically entered into in order to extend existing hedges without the need to amend existing contracts.

(b) Includes certain derivative instruments that do not involve the exchange of notional amounts at the inception and maturity of the instruments. Accordingly, the only cash flows associated with these derivative instruments are coupon-related payments and receipts.

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, 2022:

	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	\$ 5,945.2 (a)	2.3	\$ 3,419.2	3.7
Telenet	\$ 2,954.7 (a)	2.3	\$ 1,394.5	0.8

(a) Includes forward-starting derivative instruments.

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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, 2022, 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, 2022:

	<u>Notional amount due from counterparty</u> in millions	<u>Weighted average remaining life</u> in years
UPC Holding	\$ 3,417.0 (a)	0.2
Telenet	\$ 2,295.0	—

(a) Includes forward-starting derivative instruments.

Interest Rate Caps, Floors and Collars

From time to time, we enter into interest rate cap, floor and collar agreements. Purchased interest rate caps and collars lock in a maximum interest rate if variable rates rise, but also allow our company to benefit, to a limited extent in the case of collars, from declines in market rates. Purchased interest rate floors protect us from interest rates falling below a certain level, generally to match a floating rate floor on a debt instrument. At December 31, 2022, we had no interest rate collar agreements, and the total U.S. dollar equivalents of the notional amounts of our purchased interest rate caps and floors were \$1.2 billion and \$7.4 billion, 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:

	<u>Decrease to borrowing costs at December 31, 2022 (a)</u>
UPC Holding	(2.79)%
Telenet	(2.38)%
VM Ireland	(2.28)%
Total decrease to borrowing costs	(2.58)%

(a) Represents the effect of derivative instruments in effect at December 31, 2022 and does not include forward-starting derivative instruments.

Foreign Currency Forwards and Options

Certain of our subsidiaries enter into foreign currency forward and option contracts with respect to non-functional currency exposure, including hedges of the proceeds from the sale of UPC Poland. As of December 31, 2022, the total U.S. dollar equivalent of the notional amounts of our foreign currency forward and option contracts was \$873.5 million.

(9) Fair Value Measurements

We use the fair value method to account for (i) certain of our investments and (ii) our derivative instruments. The reported fair values of these investments and derivative instruments as of December 31, 2022 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 2022, our investment in CANAL+ Polska transferred from Level 2 to Level 3 due to a lack of readily available observable inputs.

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. For such investments, we generally apply a measurement alternative to record these investments at cost less impairment, adjusted for observable price changes in orderly transactions. For privately-held investments that don't qualify for the measurement alternative, we apply a combination of an income approach (discounted cash flow model based on forecasts) and a market approach (transactions with new third-party investors or market multiples of similar businesses). With the exception of certain inputs for our weighted average cost of capital calculations that are derived from pricing services, the inputs used to value these investments are based on unobservable inputs derived from our assumptions. Therefore, the valuation of our privately-held investments falls under Level 3 of the fair value hierarchy. Any reasonably foreseeable changes in assumed levels of unobservable inputs for the valuations of our Level 3 investments would not be expected to have a material impact on our financial position or results of operations.

The recurring fair value measurements of our equity-related derivative instruments are based on standard option pricing models, which require the input of observable and unobservable variables such as exchange-traded equity prices, risk-free interest rates, dividend forecasts and forecasted volatilities of the underlying equity securities. The valuations of our equity-related derivative instruments are based on a combination of Level 1 inputs (exchange-traded equity prices), Level 2 inputs (interest rate futures and swap rates) and Level 3 inputs (forecasted volatilities). As changes in volatilities could have a significant impact on the overall valuations over the terms of the derivative instruments, we have determined that these valuations fall under Level 3 of the fair value hierarchy. At December 31, 2022, our equity-related derivatives were not significantly impacted by forecasted volatilities.

In order to manage our interest rate and foreign currency exchange risk, we have entered into various derivative instruments, as further described in note 8. The recurring fair value measurements of these instruments are determined using discounted cash flow models. Most of the inputs to these discounted cash flow models consist of, or are derived from, observable Level 2 data for substantially the full term of these instruments. This observable data mostly includes currency rates,

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interest rate futures and swap rates, which are retrieved or derived from available market data. Although we may extrapolate or interpolate this data, we do not otherwise alter this data in performing our valuations. We classify deal-contingent hedges under Level 3 of the fair value hierarchy, as we adjust the valuations to reflect an internal judgement of the probability of the completion of the deal, which is unobservable. We use a Monte Carlo based approach to incorporate a credit risk valuation adjustment in our fair value measurements to estimate the impact of both our own nonperformance risk and the nonperformance risk of our counterparties. The inputs used for our credit risk valuations, including our and our counterparties' credit spreads, represent our most significant Level 3 inputs, and these inputs are used to derive the credit risk valuation adjustments with respect to these instruments. As we would not expect these parameters to have a significant impact on the valuations of these instruments, we have determined that these valuations fall under Level 2 of the fair value hierarchy. Our credit risk valuation adjustments with respect to our cross-currency and interest rate swaps are quantified and further explained in note 8.

Fair value measurements are also used in connection with nonrecurring valuations performed in connection with acquisition accounting, impairment assessments and the accounting for our initial investment in the VMO2 JV. These nonrecurring valuations include the valuation of reporting units, customer relationships and other intangible assets, property and equipment, the implied value of goodwill and the valuation of our initial investment in the VMO2 JV. The valuation of reporting units and our initial investment in the VMO2 JV are based at least in part on discounted cash flow analyses. With the exception of certain inputs for our weighted average cost of capital and discount rate calculations that are derived from pricing services, the inputs used in our discounted cash flow analyses, such as forecasts of future cash flows, including inputs with respect to revenue growth and Adjusted EBITDA margin (as defined in note 19), and terminal growth rates, are based on our assumptions. The valuation of customer relationships is primarily based on an excess earnings methodology, which is a form of a discounted cash flow analysis. The excess earnings methodology requires us to estimate the specific cash flows expected from the customer relationship, considering such factors as estimated customer life, the revenue expected to be generated over the life of the customer relationship, contributory asset charges and other factors. Tangible assets are typically valued using a replacement or reproduction cost approach, considering factors such as current prices of the same or similar equipment, the age of the equipment and economic obsolescence. The implied value of goodwill is determined by allocating the fair value of a reporting unit to all of the assets and liabilities of that unit as if the reporting unit had been acquired in a business combination, with the residual amount allocated to goodwill. Most of our nonrecurring valuations use significant unobservable inputs and therefore fall under Level 3 of the fair value hierarchy. During 2022, we did not perform any significant nonrecurring fair value measurements. During 2021, we performed a nonrecurring valuation for the purpose of determining the fair value of our initial investment in the VMO2 JV, and the weighted average cost of capital used to value our initial investment was 6.9%. For information regarding our investment in the VMO2 JV, see note 7.

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

<u>Description</u>	Fair value measurements at December 31, 2022 using:			
	December 31, 2022	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	\$ 1,469.0	\$ —	\$ 1,469.0	\$ —
Equity-related derivative instruments	92.4	—	—	92.4
Foreign currency forward and option contracts	1.0	—	1.0	—
Other	0.3	—	0.3	—
Total derivative instruments	1,562.7	—	1,470.3	92.4
Investments:				
SMA	2,854.6	943.2	1,911.4	—
Other investments	1,946.0	399.3	0.1	1,546.6
Total investments	4,800.6	1,342.5	1,911.5	1,546.6
Total assets	\$ 6,363.3	\$ 1,342.5	\$ 3,381.8	\$ 1,639.0
Liabilities:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 735.5	\$ —	\$ 735.5	\$ —
Foreign currency forward and option contracts	11.6	—	11.6	—
Total liabilities	\$ 747.1	\$ —	\$ 747.1	\$ —

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<u>Description</u>	Fair value measurements at December 31, 2021 using:			
	December 31, 2021	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
in millions				
Assets:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 379.2	\$ —	\$ 379.2	\$ —
Equity-related derivative instruments	113.8	—	—	113.8
Foreign currency forward and option contracts	28.4	—	9.0	19.4
Other	1.0	—	1.0	—
Total derivative instruments	522.4	—	389.2	133.2
Investments:				
SMAs	2,801.3	672.1	2,124.2	5.0
Other investments	2,226.1	747.9	70.8	1,407.4
Total investments	5,027.4	1,420.0	2,195.0	1,412.4
Total assets	\$ 5,549.8	\$ 1,420.0	\$ 2,584.2	\$ 1,545.6
Liabilities:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 879.0	\$ —	\$ 846.3	\$ 32.7
Foreign currency forward and option contracts	13.0	—	13.0	—
Total liabilities	\$ 892.0	\$ —	\$ 859.3	\$ 32.7

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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, 2022	\$ 1,412.4	\$ (13.3)	\$ 113.8	\$ 1,512.9
Gains (losses) included in earnings from continuing operations (a):				
Realized and unrealized gains due to changes in fair values of certain investments, net	81.9	—	—	81.9
Realized and unrealized losses on derivative instruments, net	—	—	(21.4)	(21.4)
Additions	98.3	—	—	98.3
Dispositions	(72.7)	—	—	(72.7)
Transfers in to Level 3	57.5	—	—	57.5
Transfers out of Level 3	—	13.3	—	13.3
Foreign currency translation adjustments and other, net	(30.8)	—	—	(30.8)
Balance of net assets at December 31, 2022 (b)	<u>\$ 1,546.6</u>	<u>\$ —</u>	<u>\$ 92.4</u>	<u>\$ 1,639.0</u>

(a) Amounts primarily relate to assets and liabilities that we continue to carry on our consolidated balance sheet as of December 31, 2022.

(b) As of December 31, 2022, \$306.7 million of our Level 3 investments were accounted for under the measurement alternative at cost less impairment, adjusted for observable price changes.

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(10) Long-lived Assets

Property and Equipment, Net

The details of our property and equipment and the related accumulated depreciation are set forth below:

	Estimated useful life at December 31, 2022	December 31,	
		2022	2021
in millions			
Distribution systems	3 to 30 years	\$ 9,134.3	\$ 9,472.8
Support equipment, buildings and land	3 to 33 years	4,067.2	4,310.5
Customer premises equipment	4 to 7 years	1,338.1	1,279.2
Total property and equipment, gross		14,539.6	15,062.5
Accumulated depreciation		(8,035.1)	(8,081.0)
Total property and equipment, net		\$ 6,504.5	\$ 6,981.5

Depreciation expense related to our property and equipment was \$1,727.7 million, \$1,883.2 million and \$2,053.0 million during 2022, 2021 and 2020, respectively.

During 2022, 2021 and 2020, we recorded non-cash increases to our property and equipment related to vendor financing arrangements (including amounts related to the U.K. JV Entities through the closing of the U.K. JV Transaction) of \$182.8 million, \$661.1 million and \$1,339.6 million, respectively, which exclude related VAT of \$21.2 million, \$84.7 million and \$226.6 million, respectively, that were also financed under these arrangements.

Goodwill

Changes in the carrying amount of our goodwill during 2022 are set forth below:

	January 1, 2022	Acquisitions and related adjustments	Foreign currency translation adjustments and other	December 31, 2022
in millions				
Switzerland	\$ 6,590.5	\$ —	\$ (75.4)	\$ 6,515.1
Belgium	2,591.8	39.0	(150.6)	2,480.2
Ireland	275.9	—	(16.4)	259.5
Central and Other	65.2	—	(3.9)	61.3
Total	\$ 9,523.4	\$ 39.0	\$ (246.3)	\$ 9,316.1

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

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Changes in the carrying amount of our goodwill during 2021 are set forth below:

	January 1, 2021	Acquisitions and related adjustments	Foreign currency translation adjustments and other	December 31, 2021
in millions				
Switzerland	\$ 6,816.0	\$ 18.6	\$ (244.1)	\$ 6,590.5
Belgium	2,783.7	(0.8)	(191.1)	2,591.8
Ireland	296.2	—	(20.3)	275.9
Central and Other	69.8	—	(4.6)	65.2
Total	<u>\$ 9,965.7</u>	<u>\$ 17.8</u>	<u>\$ (460.1)</u>	<u>\$ 9,523.4</u>

Intangible Assets Subject to Amortization, Net

The details of our intangible assets subject to amortization are set forth below:

	Estimated useful life at December 31, 2022	December 31, 2022			December 31, 2021		
		Gross carrying amount	Accumulated amortization	Net carrying amount	Gross carrying amount	Accumulated amortization	Net carrying amount
in millions							
Customer relationships	5 to 11 years	\$ 2,289.9	\$ (932.2)	\$ 1,357.7	\$ 2,336.2	\$ (602.2)	\$ 1,734.0
Other	2 to 20 years	1,467.2	(482.5)	984.7	1,034.3	(425.8)	608.5
Total		<u>\$ 3,757.1</u>	<u>\$ (1,414.7)</u>	<u>\$ 2,342.4</u>	<u>\$ 3,370.5</u>	<u>\$ (1,028.0)</u>	<u>\$ 2,342.5</u>

During the third quarter of 2022, Telenet acquired certain mobile spectrum licenses. In connection with this transaction, we recorded a non-cash increase of \$384.1 million to our intangible assets subject to amortization.

Amortization expense related to intangible assets with finite useful lives was \$443.7 million, \$470.5 million and \$174.2 million during 2022, 2021 and 2020, respectively. Based on our amortizable intangible asset balance at December 31, 2022, we expect that amortization expense will be as follows for the next five years and thereafter (in millions):

2023	\$ 444.3
2024	436.4
2025	433.6
2026	386.2
2027	86.8
Thereafter	555.1
Total	<u>\$ 2,342.4</u>

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(11) Debt

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

	December 31, 2022					
	Weighted average interest rate (a)	Unused borrowing capacity (b)		Principal amount		
		Borrowing currency	U.S. \$ equivalent	December 31,		
			2022	2021		
in millions						
UPC Holding Bank Facility (c)	6.60 %	€ 713.4	\$ 764.1	\$ 3,587.7	\$ 4,062.5	
UPC SPE Notes	4.57 %	—	—	1,651.6	1,933.2	
UPC Holding Senior Notes	4.78 %	—	—	814.2	1,211.6	
Telenet Credit Facility (d)	5.90 %	€ 555.0	594.4	3,483.9	3,558.9	
Telenet Senior Secured Notes	4.77 %	—	—	1,578.4	1,614.9	
VM Ireland Credit Facility (e)	6.19 %	€ 100.0	107.1	963.9	1,024.9	
Vendor financing (f)	2.63 %	—	—	704.7	843.2	
Other (g)	4.21 %	—	—	585.8	149.6	
Total debt before deferred financing costs, discounts and premiums (h)	5.50 %		\$ 1,465.6	\$ 13,370.2	\$ 14,398.8	

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,	
	2022	2021
in millions		
Total debt before deferred financing costs, discounts and premiums	\$ 13,370.2	\$ 14,398.8
Deferred financing costs, discounts and premiums, net	(43.1)	(57.7)
Total carrying amount of debt	13,327.1	14,341.1
Finance lease obligations (note 12)	436.1	484.0
Total debt and finance lease obligations	13,763.2	14,825.1
Current portion of debt and finance lease obligations	(799.7)	(850.3)
Long-term debt and finance lease obligations	\$ 12,963.5	\$ 13,974.8

(a) Represents the weighted average interest rate in effect at December 31, 2022 for all borrowings outstanding pursuant to each debt instrument, including any applicable margin. The interest rates presented represent stated rates and do not include the impact of derivative instruments, deferred financing costs, original issue premiums or discounts and commitment fees, all of which affect our overall cost of borrowing. Including the effects of derivative instruments, original issue premiums or discounts and commitment fees, but excluding the impact of deferred financing costs and certain other obligations that we assumed in connection with certain acquisitions, the weighted average interest rate on our aggregate variable- and fixed-rate indebtedness was 3.21% at December 31, 2022. For information regarding our derivative instruments, see note 8.

(b) Unused borrowing capacity represents the maximum availability under the applicable facility at December 31, 2022 without regard to covenant compliance calculations or other conditions precedent to borrowing. The following table provides our borrowing availability and amounts available to loan or distribute under each of the respective subsidiary facilities, based on the most restrictive applicable leverage covenants and leverage-based restricted payment tests, (i) at

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December 31, 2022 and (ii) upon completion of the relevant December 31, 2022 compliance reporting requirements. These amounts do not consider any actual or potential changes to our borrowing levels or any amounts loaned or distributed subsequent to December 31, 2022, or the impact of additional amounts that may be available to borrow, loan or distribute under certain defined baskets within each respective facility.

	Availability			
	December 31, 2022		Upon completion of the relevant December 31, 2022 compliance reporting requirements	
	Borrowing currency	U.S. \$ equivalent	Borrowing currency	U.S. \$ equivalent
	in millions			
Available to borrow:				
UPC Holding Bank Facility	€	713.4	\$ 764.1	€ 713.4 \$ 764.1
Telenet Credit Facility	€	555.0	\$ 594.4	€ 555.0 \$ 594.4
VM Ireland Credit Facility	€	100.0	\$ 107.1	€ 100.0 \$ 107.1
Available to loan or distribute:				
UPC Holding Bank Facility	€	303.9	\$ 325.5	€ 351.5 \$ 376.5
Telenet Credit Facility	€	555.0	\$ 594.4	€ 555.0 \$ 594.4
VM Ireland Credit Facility	€	89.1	\$ 95.4	€ 60.0 \$ 64.3

- (c) Unused borrowing capacity under the UPC Holding Bank Facility relates to an equivalent €713.4 million (\$764.1 million) under the UPC Revolving Facility, part of which has been made available as an ancillary facility. With the exception of €23.0 million (\$24.6 million) of borrowings under the ancillary facility, the UPC Revolving Facility was undrawn at December 31, 2022.
- (d) Unused borrowing capacity under the Telenet Credit Facility comprises (i) €510.0 million (\$546.2 million) under the Telenet Revolving Facility I, (ii) €25.0 million (\$26.8 million) under the Telenet Overdraft Facility and (iii) €20.0 million (\$21.4 million) under the Telenet Revolving Facility, each of which were undrawn at December 31, 2022.
- (e) Unused borrowing capacity under the VM Ireland Credit Facility relates to €100.0 million (\$107.1 million) under the VM Ireland Revolving Facility, which was undrawn at December 31, 2022.
- (f) Represents amounts owed to various creditors pursuant to interest-bearing vendor financing arrangements that are used to finance certain of our property and equipment additions and operating expenses. These arrangements extend our repayment terms beyond a vendor's original due dates (e.g., extension beyond a vendor's customary payment terms, which are generally 90 days or less) and as such are classified outside of accounts payable as debt on our consolidated balance sheets. These obligations are generally due within one year and include VAT that was also financed under these arrangements. For purposes of our consolidated statements of cash flows, operating-related expenses financed by an intermediary are treated as constructive operating cash outflows and constructive financing cash inflows when the intermediary settles the liability with the vendor as there is no actual cash outflow until we pay the financing intermediary. During 2022 and 2021, the constructive cash outflow included in cash flows from operating activities and the corresponding constructive cash inflow included in cash flows from financing activities related to these operating expenses were \$522.7 million and \$1,781.6 million, respectively. Repayments of vendor financing obligations at the time we pay the financing intermediary are included in repayments and repurchases of debt and finance lease obligations in our consolidated statements of cash flows.
- (g) The December 31, 2022 amount includes \$428.1 million of liabilities related to Telenet's acquisition of mobile spectrum licenses. Telenet will make annual payments for the license fees over the terms of the respective licenses. For additional information regarding Telenet's acquisition of mobile spectrum licenses, see note 10.

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- (h) As of December 31, 2022 and 2021, our debt had an estimated fair value of \$12.6 billion and \$14.5 billion, respectively. The estimated fair values of our debt instruments are generally determined using the average of applicable bid and ask prices (mostly Level 1 of the fair value hierarchy). For additional information regarding fair value hierarchies, see note 9.

General Information

At December 31, 2022, most of our outstanding debt had been incurred by one of our three subsidiary “borrowing groups.” References to these borrowing groups, which comprise UPC Holding, Telenet and VM Ireland, include their respective restricted parent and subsidiary entities.

Credit Facilities. Each of our borrowing groups has entered into one or more credit facility agreements with certain financial and other institutions. Certain of our credit facilities provide for adjustments to our borrowing rates based on the achievement, or otherwise, of certain sustainability-linked metrics. Each of these credit facilities contain certain covenants, the more notable of which are as follows:

- Our credit facilities contain certain consolidated net leverage ratios, as specified in the relevant credit facility, which are required to be complied with (i) on an incurrence basis and/or (ii) when the associated revolving credit facilities have been drawn beyond a specified percentage of the total available revolving credit commitments on a maintenance basis;
- Subject to certain customary and agreed exceptions, our credit facilities contain certain restrictions which, among other things, restrict the ability of the members of the relevant borrowing group to (i) incur or guarantee certain financial indebtedness, (ii) make certain disposals and acquisitions, (iii) create certain security interests over their assets and (iv) make certain restricted payments to their direct and/or indirect parent companies (and indirectly to Liberty Global) through dividends, loans or other distributions;
- Our credit facilities require that certain members of the relevant borrowing group guarantee the payment of all sums payable under the relevant credit facility and such group members are required to grant first-ranking security over their shares and, in certain borrowing groups, over substantially all of their assets to secure the payment of all sums payable thereunder;
- In addition to certain mandatory prepayment events, our credit facilities provide that the instructing group of lenders under the relevant credit facility, under certain circumstances, may cancel the group’s commitments thereunder and declare the loan(s) thereunder due and payable after the applicable notice period following the occurrence of a change of control (as specified in the relevant credit facility);
- Our credit facilities contain certain customary events of default, the occurrence of which, subject to certain exceptions, materiality qualifications and cure rights, would allow the instructing group of lenders to (i) cancel the total commitments, (ii) declare that all or part of the loans be payable on demand and/or (iii) accelerate all outstanding loans and terminate their commitments thereunder;
- Our credit facilities require members of the relevant borrowing group to observe certain affirmative and negative undertakings and covenants, which are subject to certain materiality qualifications and other customary and agreed exceptions; and
- In addition to customary default provisions, our credit facilities generally include certain cross-default or cross-acceleration provisions with respect to other indebtedness of members of the relevant borrowing group, subject to agreed minimum thresholds and other customary and agreed exceptions.

Senior and Senior Secured Notes. Certain of our borrowing groups have issued senior and/or senior secured notes. In general, our senior and senior secured notes (i) are senior obligations of each respective issuer within the relevant borrowing group that rank equally with all of the existing and future senior debt of such issuer and are senior to all existing and future subordinated debt of such issuer within the relevant borrowing group, (ii) contain, in most instances, certain guarantees from other members of the relevant borrowing group (as specified in the applicable indenture) and (iii) with respect to our senior secured notes, are secured by certain pledges or liens over the shares of certain members of the relevant borrowing group and,

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in certain borrowing groups, over substantially all of their assets. In addition, the indentures governing our senior and senior secured notes contain certain covenants, the more notable of which are as follows:

- Our notes contain certain customary incurrence-based covenants. In addition, our notes provide that any failure to pay principal at its stated maturity (after giving effect to any applicable grace period) of, or any acceleration with respect to, other indebtedness of the issuer or certain subsidiaries over agreed minimum thresholds (as specified under the applicable indenture) is an event of default under the respective notes;
- Subject to certain customary and agreed exceptions, our notes contain certain restrictions that, among other things, restrict the ability of the members of the relevant borrowing group to (i) incur or guarantee certain financial indebtedness, (ii) make certain disposals and acquisitions, (iii) create certain security interests over their assets and (iv) make certain restricted payments to its direct and/or indirect parent companies (and indirectly to Liberty Global) through dividends, loans or other distributions;
- If the relevant issuer or certain of its subsidiaries (as specified in the applicable indenture) sell certain assets, such issuer must, subject to certain customary and agreed exceptions, offer to repurchase the applicable notes at par, or if a change of control (as specified in the applicable indenture) occurs, such issuer must offer to repurchase all of the relevant notes at a redemption price of 101%;
- Our senior secured notes contain certain early redemption provisions including the ability to, during each 12-month period commencing on the issue date for such notes until the applicable call date, redeem up to 10% of the principal amount of the notes at a redemption price equal to 103% of the principal amount of the notes to be redeemed plus accrued and unpaid interest; and
- Our notes are non-callable prior to their respective call date (as specified under the applicable indenture). At any time prior to the applicable call date, we may redeem some or all of the applicable notes by paying a “make-whole” premium, which is the present value of all remaining scheduled interest payments to the applicable call date using the discount rate as of the redemption date plus a premium (as specified in the applicable indenture). On or after the applicable call date, we may redeem some or all of these notes at various redemption prices plus accrued interest and additional amounts (as specified in the applicable indenture), if any, to the applicable redemption date.

SPE Notes. From time to time, we create special purpose financing entities (**SPE**), some of which are owned by the relevant borrowing group and some of which are owned by third parties (**Third-Party SPEs**). These SPEs are created for the primary purpose of facilitating the offering of senior secured notes, which we collectively refer to as “**SPE Notes**”.

The SPEs use the proceeds from the issuance of SPE Notes to fund term loan facilities under the credit facilities made available to their respective borrowing group, each a “**Funded Facility**” and collectively the “**Funded Facilities**.” Each SPE is dependent on payments from the relevant borrowing entity under the applicable Funded Facility in order to service its payment obligations under each respective SPE Note. Each of the Funded Facility term loans creates a variable interest in the respective Third-Party SPE for which the relevant borrowing entity is the primary beneficiary. Accordingly, such Third-Party SPEs are consolidated by the relevant parent entities, including Liberty Global. As a result, the amounts outstanding under the Funded Facilities of the SPEs owned by the relevant borrowing group and the Third-Party SPEs are eliminated in the consolidated financial statements of the respective borrowing group and Liberty Global. At December 31, 2022, we had outstanding SPE Notes issued by a Third-Party SPE consolidated by UPC Holding (the **UPCB SPE**).

Pursuant to the respective indentures for the SPE Notes (the **SPE Indentures**) and the respective accession agreements for the Funded Facilities, the call provisions, maturity dates and applicable interest rates for each Funded Facility are the same as those of the related SPE Notes. The SPEs, as lenders under the relevant Funded Facility for the relevant borrowing group, are treated the same as the other lenders under the respective credit facility, with benefits, rights and protections similar to those afforded to the other lenders. Through the covenants in the applicable SPE Indentures and the applicable security interests over the relevant SPE’s rights under the applicable Funded Facility granted to secure the relevant SPE’s obligations under the relevant SPE Notes, the holders of the SPE Notes are provided indirectly with the benefits, rights, protections and covenants granted to the SPEs as lenders under the applicable Funded Facility. The SPEs are prohibited from incurring any additional indebtedness, subject to certain exceptions under the SPE Indentures.

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The SPE Notes are non-callable prior to their respective call date (as specified under the applicable SPE Indenture). If, however, at any time prior to the applicable call date, all or a portion of the loans under the related Funded Facility are voluntarily prepaid (a **SPE Early Redemption Event**), then the SPE will be required to redeem an aggregate principal amount of its respective SPE Notes equal to the aggregate principal amount of the loans prepaid under the relevant Funded Facility. In general, the redemption price payable will equal 100% of the principal amount of the applicable SPE Notes to be redeemed and a “make-whole” premium, which is the present value of all remaining scheduled interest payments to the applicable call date using the discount rate as of the redemption date plus a premium (as specified in the applicable SPE Indenture).

Upon the occurrence of a SPE Early Redemption Event on or after the applicable call date, the SPE will redeem an aggregate principal amount of its respective SPE Notes equal to the principal amount prepaid under the related Funded Facility at a redemption price (expressed as a percentage of the principal amount) plus accrued and unpaid interest and additional amounts (as specified in the applicable SPE Indenture), if any, to the applicable redemption date.

Financing Transactions

Below we provide summary descriptions of certain financing transactions completed during 2022, 2021 and 2020. A portion of our financing transactions may include non-cash borrowings and repayments. During 2022, 2021 and 2020, non-cash borrowings and repayments aggregated nil, \$2.9 billion and \$3.5 billion, respectively, including amounts related to the U.K. JV Entities prior to completion of the U.K. JV Transaction.

UPC Holding - 2022 Financing Transactions

In April 2022, a portion of the net proceeds from the sale of UPC Poland was used to (i) purchase and extinguish €216.5 million (\$231.9 million) of the €600.0 million (\$642.6 million) outstanding principal amount under UPC Facility AQ, together with accrued and unpaid interest, from the related UPCB SPE and, simultaneously, an equal amount of UPCB Finance VII Euro Notes were purchased and cancelled, (ii) purchase and cancel €205.1 million (\$219.7 million) of the €594.3 million (\$636.5 million) outstanding principal amount of UPC Holding 3.875% Senior Notes, (iii) purchase and cancel \$82.7 million of the \$535.0 million outstanding principal amount of UPC Holding 5.50% Senior Notes, (iv) purchase and extinguish \$208.0 million of the \$1,925.0 million outstanding principal amount under UPC Facility AX, (v) purchase and extinguish €169.5 million (\$181.5 million) of the €862.5 million (\$923.8 million) outstanding principal amount under UPC Facility AY and (vi) settle associated derivatives. In connection with these transactions, UPC Holding recognized a net loss on debt extinguishment of \$2.0 million related to (a) the write-off of \$5.2 million of unamortized deferred financing costs and discounts, (b) a net gain associated with settlement discounts of \$4.7 million and (c) the payment of \$1.5 million of third-party costs.

In May 2022, an additional (i) €51.3 million (\$54.9 million) of UPC Holding 3.875% Senior Notes were purchased and cancelled and (ii) €8.6 million (\$9.2 million) under UPC Facility AQ, together with accrued and unpaid interest, was purchased and extinguished and, simultaneously, an equal amount of UPCB Finance VII Euro Notes were purchased and cancelled. In connection with these transactions, UPC Holding recognized a net gain on debt extinguishment of \$4.8 million related to (a) a gain associated with settlement discounts of \$5.1 million and (b) the write-off of \$0.3 million of unamortized deferred financing costs and discounts.

UPC Holding - 2021 and 2020 Financing Transactions

During 2021 and 2020, 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 \$90.6 million and \$43.1 million during 2021 and 2020, respectively. These losses primarily include (i) the write-off of net unamortized deferred financing costs, discounts and premiums of \$77.7 million and \$0.3 million and (ii) the payment of redemption premiums of \$12.9 million and \$43.8 million, respectively.

Telenet - 2020 Financing Transactions

During 2020, Telenet completed a number of financing transactions that generally resulted in lower interest rates and extended maturities. In connection with these transactions, Telenet recognized a loss on debt extinguishment of \$18.9 million related to the write-off of net unamortized deferred financing costs, discounts and premiums.

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Maturities of Debt

Maturities of our debt as of December 31, 2022 are presented below for the named entity and its subsidiaries, unless otherwise noted, and represent U.S. dollar equivalents based on December 31, 2022 exchange rates.

	UPC Holding (a)	Telenet	VM Ireland	Other	Total
	in millions				
Year ending December 31:					
2023	\$ 284.6	\$ 403.5	\$ —	\$ 33.4	\$ 721.5
2024	—	28.7	—	15.1	43.8
2025	—	31.3	—	1.1	32.4
2026	—	33.9	—	—	33.9
2027	—	33.6	—	—	33.6
Thereafter	6,053.5	5,487.6	963.9	—	12,505.0
Total debt maturities (b)	6,338.1	6,018.6	963.9	49.6	13,370.2
Deferred financing costs, discounts and premiums, net	(25.8)	(11.4)	(5.9)	—	(43.1)
Total debt	\$ 6,312.3	\$ 6,007.2	\$ 958.0	\$ 49.6	\$ 13,327.1
Current portion	\$ 284.6	\$ 403.5	\$ —	\$ 33.4	\$ 721.5
Long-term portion	\$ 6,027.7	\$ 5,603.7	\$ 958.0	\$ 16.2	\$ 12,605.6

(a) Amounts include SPE Notes issued by the UPCB SPE which, as described above, is consolidated by UPC Holding and Liberty Global.

(b) Amounts include vendor financing obligations of \$704.7 million, as set forth below:

	UPC Holding	Telenet	Other	Total
	in millions			
Year ending December 31:				
2023	\$ 284.6	\$ 370.5	\$ 33.4	\$ 688.5
2024	—	—	15.1	15.1
2025	—	—	1.1	1.1
Total vendor financing maturities	\$ 284.6	\$ 370.5	\$ 49.6	\$ 704.7
Current portion	\$ 284.6	\$ 370.5	\$ 33.4	\$ 688.5
Long-term portion	\$ —	\$ —	\$ 16.2	\$ 16.2

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Vendor Financing Obligations

A reconciliation of the beginning and ending balances of our vendor financing obligations for the indicated periods is set forth below:

	2022	2021
	in millions	
Balance at January 1	\$ 843.2	\$ 1,099.6
Vendor financing obligations of the U.K. JV Entities at January 1	—	2,805.8
Balance at January 1, including amounts classified as held for sale	843.2	3,905.4
Operating-related vendor financing additions	522.7	1,781.6
Capital-related vendor financing additions	182.8	661.1
Principal payments on operating-related vendor financing	(616.1)	(1,408.0)
Principal payments on capital-related vendor financing	(210.1)	(964.4)
Foreign currency, acquisitions and other	(17.8)	108.8
Total vendor financing obligations	704.7	4,084.5
Less: vendor financing obligations of the U.K. JV Entities (a)	—	(3,241.3)
Balance at December 31	\$ 704.7	\$ 843.2

(a) Represents vendor financing obligations of the U.K. JV Entities at June 1, 2021, the date of completion of the U.K. JV Transaction.

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(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,	
	2022	2021
	in millions	
ROU assets:		
Finance leases (a)	\$ 377.6	\$ 426.0
Operating leases (b)	1,724.4	1,327.8
Total ROU assets	\$ 2,102.0	\$ 1,753.8
Lease liabilities:		
Finance leases (c)	\$ 436.1	\$ 484.0
Operating leases (d)	1,791.1	1,364.8
Total lease liabilities	\$ 2,227.2	\$ 1,848.8

- (a) Our finance lease ROU assets are included in property and equipment, net, on our consolidated balance sheets. At December 31, 2022, the weighted average remaining lease term for finance leases was 21.6 years and the weighted average discount rate was 6.0%. During 2022, 2021 and 2020, we recorded non-cash additions to our finance lease ROU assets (including amounts related to the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction) of \$34.2 million, \$42.6 million and \$48.7 million, respectively.
- (b) Our operating lease ROU assets are included in other assets, net, on our consolidated balance sheets. At December 31, 2022, the weighted average remaining lease term for operating leases was 13.0 years and the weighted average discount rate was 5.7%. During 2022, 2021 and 2020, we recorded non-cash additions to our operating lease ROU assets (including amounts related to the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction) of \$678.6 million, \$169.8 million and \$123.0 million, respectively. For additional information regarding the non-cash additions to our operating lease ROU assets during 2022 related to the Telenet Tower Lease Agreement, see note 6.
- (c) The current and long-term portions of our finance lease liabilities are included within current portion of debt and finance lease obligations and long-term debt and finance lease obligations, respectively, on our consolidated balance sheets.
- (d) The current portions of our operating lease liabilities are included within other accrued and current liabilities on our consolidated balance sheets. For additional information regarding the increase in our operating lease liabilities during 2022 related to the Telenet Tower Lease Agreement, see note 6.

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

	Year ended December 31,		
	2022	2021	2020
in millions			
Finance lease expense:			
Depreciation and amortization	\$ 66.4	\$ 74.8	\$ 74.8
Interest expense	26.5	30.8	32.9
Total finance lease expense	92.9	105.6	107.7
Operating lease expense (a)	236.7	249.7	146.2
Short-term lease expense (a)	4.0	5.0	4.6
Variable lease expense (b)	1.9	1.6	1.4
Total lease expense	<u>\$ 335.5</u>	<u>\$ 361.9</u>	<u>\$ 259.9</u>

- (a) Our operating lease expense and short-term lease expense are included in programming and other direct costs of services, other operating expenses, SG&A expenses and impairment, restructuring and other operating items, net, in our consolidated statements of operations.
- (b) Variable lease expense represents payments made to a lessor during the lease term that vary because of a change in circumstance that occurred after the lease commencement date. Variable lease payments are expensed as incurred and are included in other operating expenses in our consolidated statements of operations.

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

	Year ended December 31,		
	2022	2021	2020
in millions			
Cash paid for amounts included in the measurement of lease liabilities:			
Operating cash outflows from operating leases	\$ 234.2	\$ 223.0	\$ 121.5
Operating cash outflows from finance leases (interest component)	26.5	30.8	32.9
Financing cash outflows from finance leases (principal component)	62.0	75.7	86.0
Total cash outflows from operating and finance leases	<u>\$ 322.7</u>	<u>\$ 329.5</u>	<u>\$ 240.4</u>

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Maturities of our operating and finance lease liabilities as of December 31, 2022 are presented below. Amounts represent U.S. dollar equivalents based on December 31, 2022 exchange rates:

	<u>Operating leases</u>	<u>Finance leases</u>
	in millions	
Year ending December 31:		
2023	\$ 261.3	\$ 101.8
2024	215.7	67.1
2025	204.1	62.0
2026	194.1	56.8
2027	188.1	51.5
Thereafter	1,566.6	225.0
Total payments	2,629.9	564.2
Less: present value discount	(838.8)	(128.1)
Present value of lease payments	\$ 1,791.1	\$ 436.1
Current portion	\$ 145.2	\$ 78.2
Long-term portion	\$ 1,645.9	\$ 357.9

(13) Income Taxes

Liberty Global files our primary income tax return in the U.K. Our 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 our 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:

	<u>Year ended December 31,</u>		
	<u>2022</u>	<u>2021</u>	<u>2020</u>
	in millions		
Belgium	\$ 1,000.4	\$ 404.7	\$ 343.5
The Netherlands	742.3	644.5	(606.0)
U.K.	(516.2)	12,922.0	(1,470.0)
Luxembourg	505.4	373.2	95.5
Switzerland	(470.5)	(308.3)	(21.2)
Ireland	178.3	39.5	(7.6)
U.S.	5.9	(3.7)	(46.0)
Intercompany activity with discontinued operations	(15.6)	(54.2)	(75.0)
Other	(5.8)	(16.9)	(14.2)
Total	\$ 1,424.2	\$ 14,000.8	\$ (1,801.0)

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Income tax benefit (expense) consists of:

	Current	Deferred	Total
	in millions		
Year ended December 31, 2022:			
U.S. (a)	\$ (51.8)	\$ (133.0)	\$ (184.8)
Luxembourg	(0.3)	(152.3)	(152.6)
Switzerland	0.6	87.2	87.8
Belgium	(87.7)	17.1	(70.6)
Ireland	(5.3)	10.5	5.2
The Netherlands	(1.7)	(0.8)	(2.5)
U.K.	(0.1)	0.8	0.7
Other	(0.1)	(2.0)	(2.1)
Total	<u>\$ (146.4)</u>	<u>\$ (172.5)</u>	<u>\$ (318.9)</u>
Year ended December 31, 2021:			
U.K.	\$ (0.4)	\$ (319.5)	\$ (319.9)
U.S. (a)	(47.9)	(25.8)	(73.7)
Belgium	(96.3)	16.2	(80.1)
Switzerland	(7.2)	63.5	56.3
Luxembourg	(0.4)	(49.5)	(49.9)
The Netherlands	(2.6)	(1.3)	(3.9)
Ireland	(0.7)	—	(0.7)
Other	0.4	(1.8)	(1.4)
Total	<u>\$ (155.1)</u>	<u>\$ (318.2)</u>	<u>\$ (473.3)</u>
Year ended December 31, 2020:			
U.S. (a)	\$ 81.5	\$ 159.7	\$ 241.2
U.K.	(1.3)	52.2	50.9
Switzerland	(3.5)	41.2	37.7
Luxembourg	(0.3)	(27.1)	(27.4)
Belgium	(54.5)	36.3	(18.2)
The Netherlands	(7.7)	—	(7.7)
Other	(1.2)	0.6	(0.6)
Total	<u>\$ 13.0</u>	<u>\$ 262.9</u>	<u>\$ 275.9</u>

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

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Income tax benefit (expense) attributable to our earnings (loss) from continuing operations before income taxes differs from the amounts computed using the applicable income tax rate as a result of the following factors:

	Year ended December 31,		
	2022	2021	2020
	in millions		
Computed “expected” tax benefit (expense) (a)	\$ (270.6)	\$ (2,660.2)	\$ 342.2
Non-deductible or non-taxable foreign exchange results	267.3	218.0	(395.1)
International rate differences (b)	(147.1)	(92.4)	6.7
Non-deductible or non-taxable interest and other expenses	(89.6)	(69.0)	(25.1)
Basis and other differences in the treatment of items associated with investments in subsidiaries and affiliates (c)	(68.4)	84.0	(245.8)
Change in valuation allowances	(39.0)	(62.2)	(8.4)
Tax benefit associated with technologies innovation (d)	22.1	25.8	62.2
Enacted tax law and rate changes (e)	3.4	2.2	248.2
Non-taxable gain on U.K. JV transaction	—	2,066.0	—
Recognition of previously unrecognized tax benefits	—	20.5	285.8
Other, net	3.0	(6.0)	5.2
Total income tax benefit (expense)	<u>\$ (318.9)</u>	<u>\$ (473.3)</u>	<u>\$ 275.9</u>

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

(b) Amounts reflect adjustments (either a benefit or expense) to the “expected” tax benefit (expense) for statutory rates in jurisdictions in which we operate outside of the U.K.

(c) Amounts reflect the net impact of differences in the treatment of income and loss items between financial reporting and tax accounting related to investments in subsidiaries and affiliates, including the effects of foreign earnings.

(d) Amounts reflect the recognition of the innovation income tax deduction in Belgium, including the one-time effect of deductions related to prior periods in 2020.

(e) On June 10, 2021, legislation was enacted in the U.K. to increase the U.K. corporate income rate to 25.0% from April 1, 2023. The impact of this rate change on our deferred tax balances was recorded during the second quarter of 2021. On July 22, 2020, legislation was enacted in the U.K. to maintain the corporate income tax rate at 19.0%, reversing previous legislation that had reduced the U.K. rate to 17.0% from April 1, 2020. The impact of this rate change on our deferred tax balances was recorded during the third quarter of 2020. Effective January 1, 2022, the enacted corporate income tax rate in the Netherlands increased from 25.0% to 25.8%. This change did not have a material impact on our consolidated financial statements.

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

	December 31,	
	2022	2021
in millions		
Deferred tax assets (a)	\$ 233.8	\$ 423.4
Deferred tax liabilities (a)	(533.8)	(544.5)
Net deferred tax liability	<u>\$ (300.0)</u>	<u>\$ (121.1)</u>

(a) Our deferred tax assets and deferred tax liabilities are included within other assets, net, and other long-term liabilities, respectively, on our consolidated balance sheets.

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

	December 31,	
	2022	2021
in millions		
Deferred tax assets:		
Net operating loss and other carryforwards	\$ 1,327.6	\$ 1,482.5
Investments	251.8	165.1
Lease liabilities	184.0	58.2
Debt and interest	175.7	213.3
Property and equipment, net	125.7	135.8
Share-based compensation	84.7	93.6
Derivative instruments	4.3	145.2
Other future deductible amounts	64.6	81.2
Deferred tax assets	2,218.4	2,374.9
Valuation allowance	(1,586.5)	(1,744.6)
Deferred tax assets, net of valuation allowance	<u>631.9</u>	<u>630.3</u>
Deferred tax liabilities:		
Intangible assets	(336.7)	(418.4)
ROU assets	(177.1)	(54.0)
Property and equipment, net	(157.6)	(188.9)
Derivative instruments	(155.3)	(0.8)
Debt and interest	(91.1)	(82.3)
Other future taxable amounts	(14.1)	(7.0)
Deferred tax liabilities	<u>(931.9)</u>	<u>(751.4)</u>
Net deferred tax liability	<u>\$ (300.0)</u>	<u>\$ (121.1)</u>

Our deferred income tax valuation allowance decreased \$158.1 million in 2022. This decrease reflects the net effect of (i) expiration of net operating losses, (ii) foreign currency translation adjustments, (iii) net tax expense of \$39.0 million and (iv) other individually insignificant items.

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The significant components of our tax loss carryforwards and related tax assets at December 31, 2022 are as follows:

<u>Country</u>	<u>Tax loss carryforward</u>	<u>Related tax asset</u>	<u>Expiration date</u>
	in millions		
The Netherlands	\$ 2,593.2	\$ 669.0	Indefinite
Belgium	1,099.0	274.7	Indefinite
U.K.	618.0	154.5	Indefinite
Luxembourg	537.3	146.1	Various
Ireland	432.0	54.3	Indefinite
Other	157.5	29.0	Various
Total	<u>\$ 5,437.0</u>	<u>\$ 1,327.6</u>	

Our tax loss carryforwards within each jurisdiction combine all companies' tax losses (both capital and ordinary losses) in that jurisdiction, however, certain tax jurisdictions limit the ability to offset taxable income of a separate company or different tax group with the tax losses associated with another separate company or group. Further, tax jurisdictions restrict the type of taxable income that the above losses are able to offset. The majority of the tax losses shown in the above table are not expected to be realized, including certain losses that are limited in use due to change in control or same business tests.

We have taxable outside basis differences on certain investments in non-U.S. subsidiaries. No additional income taxes have been provided for any undistributed foreign earnings, or any additional outside basis difference inherent in these entities, as these amounts continue to be reinvested in foreign operations. At December 31, 2022, 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.

On August 16, 2022, the Inflation Reduction Act was signed into law in the U.S. Although this legislation does not increase the U.S. corporate income tax rate, it includes, among other provisions, a new corporate alternative minimum tax (CAMT) on "adjusted financial statement income" that is effective for tax years beginning after December 31, 2022. We do not currently anticipate that the CAMT will have a material impact on our consolidated financial statements, although we will continue to monitor additional guidance as it is issued to assess the impact to our tax position. We will disregard our CAMT status when evaluating our deferred tax assets under the regular U.S. tax system.

We and our subsidiaries file consolidated and standalone income tax returns in various jurisdictions. In the normal course of business, our income tax filings are subject to review by various taxing authorities. In connection with such reviews, disputes could arise with the taxing authorities over the interpretation or application of certain income tax rules related to our business in that tax jurisdiction. Such disputes may result in future tax and interest and penalty assessments by these taxing authorities. The ultimate resolution of tax contingencies will take place upon the earlier of (i) the settlement date with the applicable taxing authorities in either cash or agreement of income tax positions or (ii) the date when the tax authorities are statutorily prohibited from adjusting the company's tax computations.

In general, tax returns filed by our company or our subsidiaries for years prior to 2010 are no longer subject to examination by tax authorities. Certain of our subsidiaries are currently involved in income tax examinations in various jurisdictions in which we operate, including Belgium, Ireland and the U.S. While we do not expect adjustments from the foregoing examinations to have a material impact on our consolidated financial position, results of operations or cash flows, no assurance can be given that this will be the case given the amounts involved and the complex nature of the related issues.

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The changes in our unrecognized tax benefits for the indicated periods are summarized below:

	2022	2021	2020
	in millions		
Balance at January 1	\$ 447.1	\$ 602.5	\$ 662.4
Reductions for tax positions of prior years	(11.2)	(170.0)	(361.5)
Foreign currency translation	(2.3)	(8.7)	15.5
Additions based on tax positions related to the current year	1.7	14.3	290.6
Lapse of statute of limitations	(0.1)	(3.9)	(2.7)
Additions for tax positions of prior years	—	12.9	134.1
Reduction related to the held for sale group	—	—	(131.8)
Settlements with tax authorities	—	—	(4.1)
Balance at December 31	<u>\$ 435.2</u>	<u>\$ 447.1</u>	<u>\$ 602.5</u>

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

As of December 31, 2022, 2021 and 2020, there were \$337.9 million, \$378.7 million, and \$418.2 million, respectively, of unrecognized tax benefits that would have a favorable impact on our effective income tax rate if ultimately recognized, after considering amounts that we would expect to be offset by valuation allowances and other factors.

During 2023, we do not expect any material reductions to our unrecognized tax benefits related to tax positions taken as of December 31, 2022. No assurance can be given as to the nature or impact of any changes in our unrecognized tax positions during 2023.

During 2022, 2021 and 2020, the income tax expense of our continuing operations included \$38.4 million, \$25.7 million and \$26.3 million, respectively, representing the net accrual of interest and penalties during the period. At December 31, 2022, our other long-term liabilities included accrued interest and penalties of \$203.3 million.

On October 7, 2022, the U.S. Department of Justice filed suit against Liberty Global, Inc. (LGI), a wholly owned U.S. subsidiary of Liberty Global, in the U.S. District Court of Colorado for unpaid federal income taxes and penalties for the 2018 tax year of approximately \$284 million. This action by the U.S. Department of Justice is related to the November 2020 complaint filed by LGI in the District Court of Colorado seeking a refund of approximately \$110 million of taxes, penalties and interest associated with the application of certain temporary Treasury regulations issued in June 2019. No amounts have been accrued by LGI with respect to this matter. We will vigorously defend this matter and continue to actively pursue our claim for refund.

(14) Equity

Capitalization

At December 31, 2022, our authorized share capital consisted of an aggregate nominal amount of \$20.0 million, consisting of any of the following: (i) ordinary shares (Class A, B or C), each with a nominal value of \$0.01 per share, (ii) preference shares, with a nominal value to be determined by the board of directors, the issuance of one or more classes or series of which may be authorized by the board of directors, and (iii) any other shares of one or more classes as may be determined by the board of directors or by the shareholders of Liberty Global.

Under Liberty Global's Articles of Association, effective July 1, 2015, holders of Liberty Global Class A ordinary shares are entitled to one vote for each such share held, and holders of Liberty Global Class B ordinary shares are entitled to 10 votes for each such share held, on all matters submitted to a vote of Liberty Global shareholders at any general meeting (annual or special). Holders of Liberty Global Class C ordinary shares are not entitled to any voting powers except as required by law.

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At the option of the holder, each Liberty Global Class B ordinary share is convertible into one Liberty Global Class A ordinary share. One Liberty Global Class A ordinary share is reserved for issuance for each Liberty Global Class B ordinary share that is issued (12,994,000 shares issued as of December 31, 2022). Additionally, at December 31, 2022, we have reserved the following ordinary shares for the issuance of outstanding share-based incentive awards:

	Class A	Class C
Options	608,258	2,465,294
SARs	21,183,640	49,778,158
RSUs	1,984,663	3,968,778
PSUs and PSARs	3,281,811	6,417,033

Subject to any preferential rights of any outstanding class of our preference shares, the holders of our ordinary shares are entitled to dividends as may be declared from time to time by our board of directors from funds available therefore. Except with respect to share distributions, whenever a dividend is paid in cash to the holder of one class of our ordinary shares, we shall also pay to the holders of the other classes of our ordinary shares an equal per share dividend. There are currently no contractual restrictions on our ability to pay dividends in cash or shares.

In the event of our liquidation, dissolution or winding up, after payment or provision for payment of our debts and liabilities and subject to the prior payment in full of any preferential amounts to which our preference shareholders, if any, may be entitled, the holders of our ordinary shares will be entitled to receive their proportionate interests, expressed in liquidation units, in any assets available for distribution to our ordinary shares.

Share Repurchase Programs

As a U.K. incorporated company, we may only elect to repurchase shares or pay dividends to the extent of our “**Distributable Reserves.**” Distributable Reserves, which are not linked to a GAAP reported amount, may be created through the earnings of the U.K. parent company and, among other methods, through a reduction in share premium approved by the English Companies Court. Based on the amounts set forth in our 2021 U.K. Companies Act Report dated April 29, 2022, which are our most recent “Relevant Accounts” for purposes of determining our Distributable Reserves under U.K. law, our Distributable Reserves were \$17.1 billion as of December 31, 2021. This amount does not reflect earnings, share repurchases or other activity that occurred during 2022, each of which impacts the amount of our Distributable Reserves.

Our board of directors has approved various share repurchase programs for our Liberty Global ordinary shares. Under our repurchase programs, we may acquire from time to time our Class A ordinary shares, Class C ordinary shares or any combination of Class A and Class C ordinary shares. Our repurchase programs may be effected through open market transactions and/or privately negotiated transactions, which may include derivative transactions. The timing of the repurchase of shares pursuant to these programs will depend on a variety of factors, including market conditions and applicable law, and these programs may be implemented in conjunction with brokers for the company and other financial institutions with whom the company has relationships within certain preset parameters and purchases may continue during closed periods in accordance with applicable restrictions. Our share repurchase programs may be suspended or discontinued at any time. In July 2021, our board of directors approved a share repurchase program pursuant to which we are authorized to repurchase 10% of our shares during each of 2022 and 2023, based on the total number of our outstanding shares as of the beginning of each respective year. As determined by our total number of outstanding shares as of December 31, 2022, we are authorized to repurchase approximately 45.9 million of our Class A and/or Class C ordinary shares during 2023. Based on the respective closing share prices as of December 30, 2022, this would equate to total share repurchases during 2023 of approximately \$0.9 billion. However, the actual U.S. dollar amount of our share repurchases during 2023 will be determined by the actual transaction date share prices during the year and could differ significantly from this amount.

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The following table provides details of our share repurchases during 2022, 2021 and 2020:

	Class A ordinary shares		Class C ordinary shares		Total cost (a) in millions
	Shares repurchased	Average price paid per share (a)	Shares repurchased	Average price paid per share (a)	
2022	3,856,700	\$ 21.55	69,381,968	\$ 23.34	\$ 1,702.6
2021	8,445,800	\$ 27.31	49,604,048	\$ 27.23	\$ 1,581.1
2020	1,309,000	\$ 22.38	54,473,323	\$ 19.15	\$ 1,072.3

(a) Includes direct acquisition costs, where applicable.

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 2022, 2021 and 2020 of €149.0 million, €306.2 million and €292.4 million, respectively. Our share of these dividends was €91.2 million (\$96.2 million at the applicable rate), €182.4 million (\$214.0 million at the applicable rate) and €177.8 million (\$205.4 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, 2022, a significant portion of our net assets represented net assets of our subsidiaries that were subject to such limitations.

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(15) Share-based Compensation

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

	Year ended December 31,		
	2022	2021	2020
	in millions		
Liberty Global:			
Non-performance based incentive awards (a)	\$ 133.5	\$ 168.6	\$ 134.1
Performance-based incentive awards (b)	7.1	59.6	127.4
Other (c)	30.8	33.6	46.2
Total Liberty Global	171.4	261.8	307.7
Telenet share-based incentive awards (d)	10.9	35.1	35.5
Other	9.8	11.2	4.8
Total	\$ 192.1	\$ 308.1	\$ 348.0
Included in:			
Other operating expenses	\$ 4.9	\$ 13.7	\$ 7.6
SG&A expenses	187.2	294.4	340.4
Total	\$ 192.1	\$ 308.1	\$ 348.0

- (a) In April 2021, with respect to 2014 and 2015 grants, and in April 2020, with respect to 2013 grants, the compensation committee of our board of directors approved the extension dates of outstanding SARs and director options from a seven-year term to a ten-year term. Accordingly, the Black-Scholes fair values of the respective outstanding awards increased, resulting in the recognition of an aggregate incremental share-based compensation expense of \$22.7 million and \$18.9 million during 2021 and 2020, respectively.
- (b) Includes share-based compensation expense related to (i) our 2019 Challenge Performance Awards and (ii) in the 2021 and 2020 periods, PSUs and our 2019 CEO Performance Award, each 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. In addition, the 2022 and 2021 amounts include compensation expense related to the 2022 and 2021 Ventures Incentive Plans, each as defined and described below.
- (d) Represents the share-based compensation expense associated with Telenet's share-based incentive awards, which, at December 31, 2022, included performance- and non-performance-based stock option awards with respect to 3,519,920 Telenet shares. These stock option awards had a weighted average exercise price of €31.43 (\$33.66).

As of December 31, 2022, \$146.2 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 1.6 years.

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The following table summarizes certain information related to the share-based incentive awards granted and exercised with respect to Liberty Global ordinary shares (includes amounts related to awards held by employees of our discontinued operations, unless otherwise noted):

	Year ended December 31,		
	2022	2021	2020
Assumptions used to estimate fair value of options and SARs granted:			
Risk-free interest rate	2.27 - 3.09%	0.48 - 1.13%	0.13 - 0.47%
Expected life	3.7 - 6.2 years	3.7 - 6.2 years	3.2 - 6.2 years
Expected volatility	33.5 - 38.1%	30.8 - 33.2%	34.6 - 38.8%
Expected dividend yield	none	none	none
Weighted average grant-date fair value per share of awards granted:			
Options	\$ 9.90	\$ 8.75	\$ 5.92
SARs	\$ 7.50	\$ 6.79	\$ 4.19
RSUs	\$ 25.51	\$ 25.69	\$ 15.66
Total intrinsic value of awards exercised (in millions):			
Options	\$ 0.5	\$ 1.4	\$ 1.2
SARs	\$ 7.0	\$ 28.9	(a)
PSARs	\$ 0.2	\$ 0.1	(a)
Cash received from exercise of options (in millions)	\$ 13.0	\$ 8.9	\$ 2.2
Income tax benefit related to share-based compensation of our continuing operations (in millions)	\$ 1.3	\$ 14.9	\$ 36.9

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

Share Incentive Plans — Liberty Global Ordinary Shares

2014 Incentive Plans

As of December 31, 2022, we are authorized to grant incentive awards under the “**Liberty Global 2014 Incentive Plan**” and the “**Liberty Global 2014 Nonemployee Director Incentive Plan**” (collectively, the **2014 Incentive Plans**). 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, 2022, the Liberty Global 2014 Incentive Plan and the Liberty Global 2014 Nonemployee Director Incentive Plan had 49,782,418 and 7,336,388 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.

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2022 Ventures Incentive Plan

In April 2022, the compensation committee of our board of directors approved the “**2022 Ventures Incentive Plan**”. The 2022 Ventures Incentive Plan was provided to executive officers and other key employees and is based on the performance of the Liberty Global Ventures Portfolio (the “**Portfolio**”), which is measured by assessing the fair value of the Portfolio over a three-year period that began on December 31, 2021 and ends on December 31, 2024. An initial fair value assessment was performed for the Portfolio as of December 31, 2021 by an independent third-party valuation specialist. Payout will be denominated in cash and will be assessed at the end of the three-year period using eligible participants’ initial contribution between 10% and 50% of their 2022 annual target equity value (which contributed amount is in lieu of their normal annual equity grant). The compensation committee has the discretion to settle the final payout amount in (i) cash or (ii) Liberty Global Class A and Class C ordinary shares based on the change in the Portfolio’s value. Subject to forfeitures, 100% of each participant’s payout will vest on or around March 15, 2025. In order to receive the payout, participants are required to remain employed through the final vesting date. The 2022 Ventures Incentive Plan awards are liability classified due to the fact that the final payout under this plan will be denominated in cash and may be settled in a variable number of shares. At December 31, 2022, the estimated fair value of the final payout under the 2022 Ventures Incentive Plan was \$9.7 million.

2021 Ventures Incentive Plan

In April 2021, the compensation committee of our board of directors approved the “**2021 Ventures Incentive Plan**”. The 2021 Ventures Incentive Plan was provided to executive officers and other key employees and is based on the performance of the Portfolio, which is measured by assessing the fair value of the Portfolio over a three-year period that began on December 31, 2020 and ends on December 31, 2023. An initial fair value assessment was performed for the Portfolio as of December 31, 2020 by an independent third-party valuation specialist. Payout will be denominated in cash and will be assessed at the end of the three-year period using eligible participants’ initial contribution between 10% and 100% of their 2021 annual target equity value (which contributed amount is in lieu of their normal annual equity grant). The compensation committee has the discretion to settle the final payout amount in (i) cash or (ii) Liberty Global Class A and Class C ordinary shares based on the change in the Portfolio’s value. Subject to forfeitures, 100% of each participant’s payout will vest on March 31, 2024. In order to receive the payout, participants are required to remain employed through the final vesting date. The 2021 Ventures Incentive Plan awards are liability classified due to the fact that the final payout under this plan will be denominated in cash and may be settled in a variable number of shares. At December 31, 2022, the estimated fair value of the final payout under the 2021 Ventures Incentive Plan was \$16.1 million.

Performance Awards

The following is a summary of the material terms and conditions with respect to our performance-based awards for certain executive officers and key employees.

2019 CEO Performance Award

In April 2019, the compensation committee of our board of directors approved the grant of RSAs and PSUs to our Chief Executive Officer (**CEO**) (the **2019 CEO Performance Award**), comprising 670,000 RSAs and 1,330,000 PSUs, each with respect to Liberty Global Class B ordinary shares. The RSAs vested on December 31, 2019, 670,000 PSUs vested on May 15, 2020, and the remaining 660,000 PSUs vested on May 15, 2021. The performance criteria for the 2019 CEO Performance Award PSUs was based on the achievement of our CEO’s performance conditions, as established by the compensation committee.

2019 Challenge Performance Awards

In March 2019, the compensation committee of our board of directors approved a challenge performance award for executive officers and certain employees (the **2019 Challenge Performance Awards**), which consists of a combination of PSARs and PSUs, in each case divided on a 1:2 ratio based on Liberty Global Class A ordinary shares and Liberty Global Class C ordinary shares. Each PSU represents the right to receive one Liberty Global Class A ordinary share or one Liberty Global Class C ordinary share, as applicable. The performance criteria for the 2019 Challenge Performance Awards is based on the participant’s performance and achievement of individual goals during the three-year period ended December 31, 2021. Subject to forfeitures, the satisfaction of performance conditions and certain other terms, 100% of each participant’s 2019 Challenge

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Performance Awards were earned and vested 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**). The performance plan for the 2019 PSUs covered the two-year period ended December 31, 2020 and included a performance target based on the achievement of a specified compound annual growth rate (**CAGR**) in a consolidated Adjusted EBITDA metric (as defined in note 19). The performance target was adjusted for events such as acquisitions, dispositions and changes in foreign currency exchange rates that affect comparability (**Adjusted EBITDA CAGR**). The 2019 PSUs required delivery of an Adjusted EBITDA CAGR of 1.38% and included over- and under-performance payout opportunities should the Adjusted EBITDA CAGR exceed or fail to meet the target, as applicable. Participants earned 65% of their targeted awards under the 2019 PSUs which vested 50% on each of April 1, 2021 and October 1, 2021.

During 2018, the compensation committee of our board of directors approved the grant of PSUs to executive officers and key employees (the **2018 PSUs**) pursuant to a performance plan that was based on the achievement of a specified Adjusted EBITDA CAGR during the two-year period ended December 31, 2019. Participants earned 106.1% of their targeted awards under the 2018 PSUs, which vested 50% on each of April 1, 2020 and October 1, 2020. The target Adjusted EBITDA CAGR for the 2018 PSUs was determined on October 26, 2018 and, accordingly, associated compensation expense was recognized prospectively from that date.

Share-based Award Activity — Liberty Global Ordinary Shares

The following tables summarize the share-based award activity during 2022 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.

<u>Options — Class A ordinary shares</u>	<u>Number of awards</u>	<u>Weighted average exercise price</u>	<u>Weighted average remaining contractual term in years</u>	<u>Aggregate intrinsic value in millions</u>
Outstanding at January 1, 2022	580,518	\$ 30.38		
Granted	50,121	22.04		
Forfeited	(10,447)	24.48		
Exercised	(11,934)	19.28		
Outstanding at December 31, 2022	<u>608,258</u>	<u>\$ 30.02</u>	<u>3.7</u>	<u>\$ —</u>
Exercisable at December 31, 2022	<u>510,074</u>	<u>\$ 31.25</u>	<u>2.7</u>	<u>\$ —</u>

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Options — Class C ordinary shares	Number of awards	Weighted average exercise price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2022	2,244,752	\$ 25.76		
Granted	297,787	25.32		
Forfeited	(22,925)	24.13		
Exercised	(54,320)	20.46		
Outstanding at December 31, 2022	<u>2,465,294</u>	<u>\$ 25.84</u>	<u>5.2</u>	<u>\$ 1.7</u>
Exercisable at December 31, 2022	<u>1,787,439</u>	<u>\$ 26.75</u>	<u>4.0</u>	<u>\$ 1.1</u>

SARs — Class A ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2022	21,077,203	\$ 27.05		
Granted	1,481,151	25.79		
Forfeited	(1,025,686)	29.39		
Exercised	(300,588)	17.37		
Impact of the sale of UPC Poland	(48,440)	28.20		
Outstanding at December 31, 2022	<u>21,183,640</u>	<u>\$ 26.98</u>	<u>4.9</u>	<u>\$ 10.2</u>
Exercisable at December 31, 2022	<u>14,135,730</u>	<u>\$ 28.52</u>	<u>3.3</u>	<u>\$ 6.3</u>

SARs — Class C ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2022	49,605,813	\$ 26.18		
Granted	2,962,302	26.26		
Forfeited	(2,023,151)	28.65		
Exercised	(675,795)	17.24		
Impact of the sale of UPC Poland	(91,011)	27.60		
Outstanding at December 31, 2022	<u>49,778,158</u>	<u>\$ 26.20</u>	<u>5.1</u>	<u>\$ 30.3</u>
Exercisable at December 31, 2022	<u>30,354,881</u>	<u>\$ 27.45</u>	<u>3.1</u>	<u>\$ 18.7</u>

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PSARs — Class A ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2022	3,352,572	\$ 25.97		
Forfeited	(56,710)	25.97		
Exercised	(591)	25.97		
Impact of the sale of UPC Poland	(13,460)	25.97		
Outstanding at December 31, 2022	<u>3,281,811</u>	<u>\$ 25.97</u>	6.2	\$ —
Exercisable at December 31, 2022	<u>3,281,811</u>	<u>\$ 25.97</u>	6.2	<u>\$ —</u>

PSARs — Class C ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term in years	Aggregate intrinsic value in millions
Outstanding at January 1, 2022	6,705,149	\$ 25.22		
Forfeited	(107,513)	25.22		
Exercised	(153,683)	25.22		
Impact of the sale of UPC Poland	(26,920)	25.22		
Outstanding at December 31, 2022	<u>6,417,033</u>	<u>\$ 25.22</u>	6.2	\$ —
Exercisable at December 31, 2022	<u>6,417,033</u>	<u>\$ 25.22</u>	6.2	<u>\$ —</u>

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, 2022	2,625,839	\$ 21.16	
Granted	1,018,770	25.21	
Forfeited	(155,581)	23.09	
Released from restrictions	(1,503,607)	21.38	
Impact of the sale of UPC Poland	(758)	22.04	
Outstanding at December 31, 2022	<u>1,984,663</u>	<u>\$ 22.92</u>	1.3

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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, 2022	—	\$ —	
Granted	71,051	24.46	
Released from restrictions	(63,161)	24.36	
Outstanding at December 31, 2022	<u>7,890</u>	<u>\$ 25.24</u>	<u>0.2</u>

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, 2022	5,250,912	\$ 20.63	
Granted	2,037,538	25.69	
Forfeited	(310,642)	22.85	
Released from restrictions	(3,007,514)	21.02	
Impact of the sale of UPC Poland	(1,516)	23.19	
Outstanding at December 31, 2022	<u>3,968,778</u>	<u>\$ 22.75</u>	<u>1.3</u>

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, 2022	933,511	\$ 25.97	
Forfeited	(2,929)	25.97	
Released from restrictions	(930,582)	25.97	
Outstanding at December 31, 2022	<u>—</u>	<u>\$ —</u>	<u>—</u>

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, 2022	1,867,022	\$ 25.22	
Forfeited	(5,856)	25.22	
Released from restrictions	(1,861,166)	25.22	
Outstanding at December 31, 2022	<u>—</u>	<u>\$ —</u>	<u>—</u>

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Share-based Award Activity — Liberty Global Ordinary Shares held by former Liberty Global employees

The following tables summarize the share-based awards held by former employees of Liberty Global subsequent to certain split-off or disposal transactions. Any future exercises of SARs or PSARs, or vesting of RSUs will increase the number of our outstanding ordinary shares.

	<u>Number of awards</u>	<u>Weighted average exercise or base price</u>	<u>Weighted average remaining contractual term in years</u>	<u>Aggregate intrinsic value in millions</u>
Options, SARs and PSARs:				
Class A:				
Outstanding	1,621,675	\$ 31.58	1.9	\$ 0.2
Exercisable	1,546,159	\$ 32.03	1.6	\$ 0.1
Class C:				
Outstanding	3,651,358	\$ 29.96	2.1	\$ 0.7
Exercisable	3,500,357	\$ 30.31	1.9	\$ 0.4

	<u>Number of awards</u>	<u>Weighted average grant- date fair value per share</u>	<u>Weighted average remaining contractual term in years</u>
Outstanding RSUs:			
Class A	32,581	\$ 23.27	0.9
Class C	66,370	\$ 22.78	0.9

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(16) Defined Benefit Plans

Certain of our subsidiaries maintain various funded and unfunded defined benefit plans for their employees. The table below provides summary information on our defined benefit plans:

	December 31,		
	2022	2021	2020 (a)
	in millions		
Fair value of plan assets (b)	\$ 1,066.1	\$ 1,269.9	\$ 1,196.8
Projected benefit obligation	\$ 1,016.0	\$ 1,280.5	\$ 1,302.7
Net asset (liability)	\$ 50.1	\$ (10.6)	\$ (105.9)

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

(b) The fair value of plan assets at December 31, 2022 includes \$976.6 million and \$89.5 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 \$1.8 million, \$10.9 million and \$14.8 million during 2022, 2021 and 2020, respectively, including \$39.6 million, \$57.4 million and \$33.4 million, respectively, representing the service cost component. These amounts exclude aggregate curtailment gains of \$4.0 million, \$7.5 million and nil, respectively, which are included in impairment, restructuring and other operating items, net, in our consolidated statements of operations.

During 2022, our subsidiaries' contributions to their respective defined benefit plans aggregated \$42.7 million. Based on December 31, 2022 exchange rates and information available as of that date, we expect this amount to be \$42.1 million in 2023.

(17) Accumulated Other Comprehensive Earnings

Accumulated other comprehensive earnings included on our consolidated balance sheets and statements of equity reflect the aggregate impact of foreign currency translation adjustments and pension-related adjustments and other. The changes in the components of accumulated other comprehensive earnings, net of taxes, are summarized as follows:

	Liberty Global shareholders				Total accumulated other comprehensive earnings
	Foreign currency translation adjustments	Pension-related adjustments and other	Accumulated other comprehensive earnings	Noncontrolling interests	
	in millions				
Balance at January 1, 2020	\$ 1,209.6	\$ (96.9)	\$ 1,112.7	\$ (2.8)	\$ 1,109.9
Other comprehensive earnings	2,599.7	(19.3)	2,580.4	0.6	2,581.0
Balance at December 31, 2020	3,809.3	(116.2)	3,693.1	(2.2)	3,690.9
Other comprehensive earnings	70.7	128.4	199.1	1.2	200.3
Balance at December 31, 2021	3,880.0	12.2	3,892.2	(1.0)	3,891.2
Other comprehensive loss	(3,259.2)	(119.6)	(3,378.8)	2.2	(3,376.6)
Balance at December 31, 2022	\$ 620.8	\$ (107.4)	\$ 513.4	\$ 1.2	\$ 514.6

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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, net of amounts reclassified to our consolidated statements of operations:

	Pre-tax amount	Tax benefit (expense)	Net-of-tax amount
	in millions		
Year ended December 31, 2022:			
Foreign currency translation adjustments	\$ (3,216.1)	\$ 1.3	\$ (3,214.8)
Pension-related adjustments and other	(113.3)	(4.1)	(117.4)
Other comprehensive loss from continuing operations	(3,329.4)	(2.8)	(3,332.2)
Other comprehensive loss from discontinued operations (a)	(44.4)	—	(44.4)
Other comprehensive loss	(3,373.8)	(2.8)	(3,376.6)
Other comprehensive earnings attributable to noncontrolling interests (b)	(2.9)	0.7	(2.2)
Other comprehensive loss attributable to Liberty Global shareholders	<u>\$ (3,376.7)</u>	<u>\$ (2.1)</u>	<u>\$ (3,378.8)</u>
Year ended December 31, 2021:			
Foreign currency translation adjustments (a)	\$ 129.4	\$ 1.2	\$ 130.6
Pension-related adjustments and other	139.9	(10.3)	129.6
Other comprehensive earnings from continuing operations	269.3	(9.1)	260.2
Other comprehensive loss from discontinued operations	(59.9)	—	(59.9)
Other comprehensive earnings	209.4	(9.1)	200.3
Other comprehensive earnings attributable to noncontrolling interests (b)	(1.6)	0.4	(1.2)
Other comprehensive earnings attributable to Liberty Global shareholders	<u>\$ 207.8</u>	<u>\$ (8.7)</u>	<u>\$ 199.1</u>
Year ended December 31, 2020:			
Foreign currency translation adjustments	\$ 2,586.4	\$ (0.2)	\$ 2,586.2
Pension-related adjustments and other	(22.5)	3.8	(18.7)
Other comprehensive earnings from continuing operations	2,563.9	3.6	2,567.5
Other comprehensive earnings from discontinued operations	13.5	—	13.5
Other comprehensive earnings	2,577.4	3.6	2,581.0
Other comprehensive earnings attributable to noncontrolling interests (b)	(0.9)	0.3	(0.6)
Other comprehensive earnings attributable to Liberty Global shareholders	<u>\$ 2,576.5</u>	<u>\$ 3.9</u>	<u>\$ 2,580.4</u>

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

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

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(18) Commitments and Contingencies

Commitments

In the normal course of business, we enter into agreements that commit our company to make cash payments in future periods with respect to network and connectivity commitments, purchases of CPE 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, 2022. The commitments included in this table do not reflect any liabilities that are included on our December 31, 2022 consolidated balance sheet.

	Payments due during:						Total
	2023	2024	2025	2026	2027	Thereafter	
in millions							
Network and connectivity commitments	\$ 245.7	\$ 180.9	\$ 126.6	\$ 75.7	\$ 71.4	\$ 827.5	\$ 1,527.8
Purchase commitments	569.2	120.3	48.2	14.2	1.1	0.2	753.2
Programming commitments	177.1	154.0	92.3	42.2	19.9	—	485.5
Other commitments	119.0	151.0	157.7	121.7	28.3	117.2	694.9
Total	\$ 1,111.0	\$ 606.2	\$ 424.8	\$ 253.8	\$ 120.7	\$ 944.9	\$ 3,461.4

Network and connectivity commitments include (i) Telenet's commitments for certain operating costs associated with its leased network and (ii) certain network capacity 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) certain service-related commitments, including information technology, maintenance and call center services and (ii) the purchase of CPE, network and other equipment.

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 aggregated \$511.3 million, \$1,123.2 million and \$1,629.3 million (including amounts related to the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction) during 2022, 2021 and 2020, respectively.

Other commitments include (i) our share of the funding commitment associated with a newly-formed infrastructure joint venture in the U.K. (the **nexfibre JV**) and (ii) various sports sponsorships.

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 2022, 2021 and 2020, see note 8. For information regarding our defined benefit plans, see note 16.

We also have commitments pursuant to agreements with, and obligations imposed by, franchise authorities and municipalities, which may include obligations in certain markets to move aerial cable to underground ducts or to upgrade,

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rebuild or extend portions of our broadband communication systems. Such amounts are not included in the above table because they are not fixed or determinable.

We have established various defined contribution benefit plans for our and our subsidiaries' employees. Our aggregate expense for matching contributions under the various defined contribution employee benefit plans was \$22.2 million, \$30.1 million and \$44.8 million (including amounts related to the U.K. JV Entities through the closing of the U.K. JV Transaction) during 2022, 2021 and 2020, respectively.

Guarantees and Other Credit Enhancements

In the ordinary course of business, we may provide (i) indemnifications to our lenders, our vendors and certain other parties and (ii) performance and/or financial guarantees to local municipalities, our customers and vendors. Historically, these arrangements have not resulted in our company making any material payments and we do not believe that they will result in material payments in the future.

Legal and Regulatory Proceedings and Other Contingencies

Interkabel Acquisition. On November 26, 2007, Telenet and four associations of municipalities in Belgium, which we refer to as the pure intercommunales or the "**PICs**," announced a non-binding agreement-in-principle to transfer the analog and digital television activities of the PICs, including all existing subscribers, to Telenet. Subsequently, Telenet and the PICs entered into a binding agreement (the **2008 PICs Agreement**), which closed effective October 1, 2008. Beginning in December 2007, Proximus NV/SA (**Proximus**), the incumbent telecommunications operator in Belgium, instituted several proceedings seeking to block implementation of these agreements. Proximus lodged summary proceedings with the President of the Court of First Instance of Antwerp to obtain a provisional injunction preventing the PICs from effecting the agreement-in-principle and initiated a civil procedure on the merits claiming the annulment of the agreement-in-principle. In March 2008, the President of the Court of First Instance of Antwerp ruled in favor of Proximus in the summary proceedings, which ruling was overturned by the Court of Appeal of Antwerp in June 2008. Proximus brought an appeal judgment before the Belgian Supreme Court, which confirmed the appeal judgment in September 2010. On April 6, 2009, the Court of First Instance of Antwerp ruled in favor of the PICs and Telenet in the civil procedure on the merits, dismissing Proximus' request for the rescission of the agreement-in-principle and the 2008 PICs Agreement. On June 12, 2009, Proximus appealed this judgment to the Court of Appeal of Antwerp. In this appeal, Proximus also sought compensation for damages. While these proceedings were suspended indefinitely, other proceedings were initiated, which resulted in a ruling by the Belgian Council of State in May 2014 annulling (i) the decision of the PICs not to organize a public market consultation and (ii) the decision from the PICs' board of directors to approve the 2008 PICs Agreement. In December 2015, Proximus resumed the civil proceedings pending with the Court of Appeal of Antwerp seeking to have the 2008 PICs Agreement annulled and claiming damages of €1.4 billion (\$1.5 billion). On December 18, 2017, the Court of Appeal of Antwerp rejected Proximus' claim in its entirety. On June 28, 2019, Proximus brought this appeal judgment before the Belgian Supreme Court. On January 22, 2021, the Belgian Supreme Court partially annulled the judgment of the Court of Appeal of Antwerp. The case was referred to the Court of Appeal of Brussels and is currently pending with this Court which will need to make a new decision on the matter within the boundaries of the annulment by the Belgian Supreme Court. It is likely that it will take the Court of Appeal of Brussels several years to decide on the matter.

No assurance can be given as to the outcome of these or other proceedings. However, an unfavorable outcome of existing or future proceedings could potentially lead to the annulment of the 2008 PICs Agreement. We do not expect the ultimate resolution of this matter to have a material impact on our results of operations, cash flows or financial position. No amounts have been accrued by us with respect to this matter as the likelihood of loss is not considered to be probable.

Telekom Deutschland Litigation. On December 28, 2012, Unitymedia filed a lawsuit against Telekom Deutschland GmbH (**Telekom Deutschland**) in which Unitymedia asserted that it pays excessive prices for the co-use of Telekom Deutschland's cable ducts in Unitymedia's footprint. The Federal Network Agency approved rates for the co-use of certain ducts of Telekom Deutschland in March 2011. Based in part on these approved rates, Unitymedia sought a reduction of the annual lease fees by approximately five-sixths. In addition, Unitymedia sought the return of similarly calculated overpayments from 2009 through the ultimate settlement date, plus accrued interest. In October 2016, the first instance court dismissed this action, and in March 2018, the court of appeal dismissed Unitymedia's appeal of the first instance court's decision. Unitymedia has since successfully appealed the case to the Federal Court of Justice, and proceedings continue before the German courts. The resolution of this matter may take several years and no assurance can be given that Unitymedia's claims will be successful. In

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connection with our sale of our former operations in Germany, Romania, Hungary and the Czech Republic to Vodafone (the **Vodafone Disposal Group**) in 2019, we will only share in 50% of any amounts recovered, plus 50% of the net present value of certain cost savings in future periods that are attributable to the favorable resolution of this matter, less 50% of associated legal or other third-party fees paid post-completion of the sale of the Vodafone Disposal Group. Any amount we may recover related to this matter will not be reflected in our consolidated financial statements until such time as the final disposition of this matter has been reached.

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). On May 26, 2020, the Belgium Regulatory Authorities adopted a final decision regarding the “reasonable access tariffs” (the **2020 Decision**) that became effective on July 1, 2020. Telenet appealed the 2018 Decision, which was rejected by the Brussels Court of Appeal on September 4, 2019.

The 2020 Decision aims to, and in its application may, strengthen Telenet’s competitors by granting them resale access to Telenet’s network to offer competing products and services notwithstanding Telenet’s substantial historical financial outlays in developing the infrastructure. In addition, any resale access granted to competitors could (i) limit the bandwidth available to Telenet to provide new or expanded products and services to the customers served by its network and (ii) adversely impact Telenet’s ability to maintain or increase its revenue and cash flows. The extent of any such adverse impacts ultimately will be dependent on the extent that competitors take advantage of the resale access afforded to Telenet’s network, the rates that Telenet receives for such access and other competitive factors or market developments.

UPC Austria Matter. On July 31, 2018, we completed the sale of our Austrian operations, “**UPC Austria**,” to Deutsche Telekom AG (**Deutsche Telekom**). In October 2019, we received notification under the terms of the relevant acquisition agreements from Deutsche Telekom and its subsidiary, T-Mobile Austria Holding GmbH, (together, the **UPC Austria Sale Counterparties**), asserting claims that totaled €126.3 million (\$135.3 million), plus interest, as of June 30, 2022. In July 2022, we agreed with the UPC Austria Sale Counterparties to resolve the matter, the terms of which were not material to us and were accrued in our consolidated financial statements during the second quarter of 2022.

Swisscom MVNO Matter. On December 8, 2017, one of our subsidiaries, UPC Schweiz GmbH, entered into an MVNO agreement with Swisscom (Schweiz) AG (**Swisscom**), as subsequently amended (the **Swisscom MVNO**), for the provision of mobile network services to certain of Sunrise’s end customers. Swisscom has claimed that UPC Schweiz GmbH is in breach of the Swisscom MVNO, and in May 2022, Swisscom initiated a debt collection proceeding against Sunrise, claiming approximately CHF 90 million (\$98 million) in damages. Swisscom then filed a formal lawsuit against Sunrise on January 11, 2023, in relation to this matter. We believe the assertions in this claim are unsupported by the terms of the Swisscom MVNO. As such, no amounts have been accrued by us with respect to this matter, as the likelihood of loss is not considered to be probable at this stage. We intend to vigorously defend this matter.

Other Contingency Matters. In connection with the dispositions of certain of our operations, we provided tax indemnities to the counterparties for certain tax liabilities that could arise from the period we owned the respective operations, subject to certain thresholds. While we have not received notification from the counterparties for indemnification, it is reasonably possible that we could, and the amounts involved could be significant. No amounts have been accrued by our company as the likelihood of any loss is not considered to be probable. Further, Liberty Global may be entitled to certain amounts that our disposed operations may recover from taxing authorities. Any such amounts will not be reflected in our consolidated financial statements until such time as the final disposition of such matters has been reached.

Other Regulatory Matters. Video distribution, broadband internet, fixed-line telephony, mobile and content businesses are regulated in each of the countries in which we or our affiliates operate. The scope of regulation varies from country to country, although in some significant respects regulation in European markets is harmonized under the regulatory structure of the European Union (E.U.). Adverse regulatory developments could subject our businesses to a number of risks. Regulation, including conditions imposed on us by competition or other authorities as a requirement to close acquisitions or dispositions, could limit growth, revenue and the number and types of services offered and could lead to increased operating costs and property and equipment additions. Regulation may also restrict our operations and subject them to further competitive pressure,

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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.

In addition to the foregoing items, we have contingent liabilities related to matters arising in the ordinary course of business, including (i) legal proceedings, (ii) issues involving VAT and wage, property, withholding and other tax issues and (iii) disputes over interconnection, programming, copyright and channel carriage fees. While we generally expect that the amounts required to satisfy these contingencies will not materially differ from any estimated amounts we have accrued, no assurance can be given that the resolution of one or more of these contingencies will not result in a material impact on our results of operations, cash flows or financial position in any given period. Due, in general, to the complexity of the issues involved and, in certain cases, the lack of a clear basis for predicting outcomes, we cannot provide a meaningful range of potential losses or cash outflows that might result from any unfavorable outcomes.

(19) Segment Reporting

We generally identify our reportable segments as (i) those consolidated subsidiaries that represent 10% or more of our revenue, Adjusted EBITDA (as defined below) or total assets or (ii) those equity method affiliates where our investment or share of revenue or Adjusted EBITDA represents 10% or more of our total assets, revenue or Adjusted EBITDA, respectively. In certain cases, we may elect to include an operating segment in our segment disclosure that does not meet the above-described criteria for a reportable segment. We evaluate performance and make decisions about allocating resources to our operating segments based on financial measures such as revenue and Adjusted EBITDA. In addition, we review non-financial measures such as customer growth, as appropriate.

Adjusted EBITDA is the primary measure used by our chief operating decision maker to evaluate segment operating performance and is also a key factor that is used by our internal decision makers to (i) determine how to allocate resources to segments and (ii) evaluate the effectiveness of our management for purposes of annual and other incentive compensation plans. As we use the term, “**Adjusted EBITDA**” is defined as earnings (loss) from continuing operations before net income tax benefit (expense), other non-operating income or expenses, net share of results of affiliates, net gains (losses) on extinguishment of debt, net realized and unrealized gains (losses) due to changes in fair values of certain investments, net foreign currency gains (losses), net gains (losses) on derivative instruments, net interest expense, depreciation and amortization, share-based compensation, provisions and provision releases related to significant litigation and impairment, restructuring and other operating items. Other operating items include (a) gains and losses on the disposition of long-lived assets, (b) third-party costs directly associated with successful and unsuccessful acquisitions and dispositions, including legal, advisory and due diligence fees, as applicable, and (c) other acquisition-related items, such as gains and losses on the settlement of contingent consideration. Our internal decision makers believe Adjusted EBITDA is a meaningful measure because it represents a transparent view of our recurring operating performance that is unaffected by our capital structure and allows management to (1) readily view operating trends, (2) perform analytical comparisons and benchmarking between segments and (3) identify strategies to improve operating performance in the different countries in which we operate. A reconciliation of earnings or loss from continuing operations to Adjusted EBITDA is presented below.

As of December 31, 2022, our reportable segments are as follows:

Consolidated:

- Switzerland
- Belgium
- Ireland

Nonconsolidated:

- VMO2 JV
- VodafoneZiggo JV

On June 1, 2021, we completed the U.K. JV Transaction, whereby we contributed the U.K. JV Entities to the VMO2 JV. Prior to the completion of the U.K. JV Transaction, we presented the U.K. JV Entities, together with our operations in Ireland, as a single reportable segment, “*U.K./Ireland*”. In connection with the completion of the U.K. JV Transaction, we have restated

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our segment presentation for all periods to separately present (i) the U.K. JV Entities and (ii) Ireland. In addition, certain other less significant entities previously included in the U.K./Ireland segment are now included within Central and Other (as defined below). Following the closing of the U.K. JV Transaction, we have identified the VMO2 JV as a nonconsolidated reportable segment. For additional information regarding the U.K. JV Transaction, see note 6.

All of our reportable segments derive their revenue primarily from residential and B2B communications services, including broadband internet, video, fixed-line telephony and mobile services.

Our “**Central and Other**” category primarily includes (i) our operations in Slovakia, (ii) services provided to the VMO2 JV, the VodafoneZiggo JV and various third parties related to transitional service agreements, (iii) sales of CPE to the VodafoneZiggo JV and (iv) certain centralized functions, including billing systems, network operations, technology, marketing, facilities, finance and other administrative functions.

We present only the reportable segments of our continuing operations in the tables below.

Performance Measures of Our Reportable Segments

The amounts presented below represent 100% of each of our reportable segment’s revenue and Adjusted EBITDA. As we have the ability to control Telenet, we consolidate 100% of Telenet’s revenue and expenses in our consolidated statements of operations despite the fact that third parties own a significant interest. The noncontrolling owners’ interests in the operating results of Telenet and other less significant majority-owned subsidiaries are reflected in net earnings or loss attributable to noncontrolling interests in our consolidated statements of operations. Similarly, despite only holding a 50% noncontrolling interest in both the VMO2 JV and the VodafoneZiggo JV, we present 100% of the revenue and Adjusted EBITDA of those entities in the tables below. Our share of the operating results of the VMO2 JV and the VodafoneZiggo JV is included in share of results of affiliates, net, in our consolidated statements of operations.

	Year ended December 31,					
	2022		2021		2020	
	Revenue	Adjusted EBITDA	Revenue	Adjusted EBITDA	Revenue	Adjusted EBITDA
	in millions					
Switzerland	\$ 3,180.9	\$ 1,137.8	\$ 3,321.9	\$ 1,208.7	\$ 1,573.8	\$ 693.8
Belgium	2,807.3	1,308.1	3,065.9	1,481.8	2,940.9	1,413.4
U.K. (a)	—	—	2,736.4	1,085.3	6,076.9	2,453.5
Ireland	494.7	197.5	550.0	218.6	513.7	202.0
Central and Other	722.4	(47.0)	648.7	(33.1)	461.9	(61.4)
Intersegment eliminations (b)	(9.6)	(1.0)	(11.6)	1.8	(21.8)	2.2
Total	<u>\$ 7,195.7</u>	<u>\$ 2,595.4</u>	<u>\$ 10,311.3</u>	<u>\$ 3,963.1</u>	<u>\$ 11,545.4</u>	<u>\$ 4,703.5</u>
VMO2 JV (c)	<u>\$ 12,857.2</u>	<u>\$ 4,562.2</u>	<u>\$ 8,522.9</u>	<u>\$ 2,716.6</u>	<u>\$ —</u>	<u>\$ —</u>
VodafoneZiggo JV	<u>\$ 4,284.6</u>	<u>\$ 2,018.0</u>	<u>\$ 4,824.2</u>	<u>\$ 2,265.6</u>	<u>\$ 4,565.4</u>	<u>\$ 2,142.0</u>

(a) Amounts represent the revenue and Adjusted EBITDA of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.

(b) Amounts relate to transactions between our continuing and discontinued operations.

(c) The 2021 amount represents the revenue and Adjusted EBITDA of the VMO2 JV for the period beginning June 1, 2021.

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

	Year ended December 31,		
	2022	2021	2020
in millions			
Earnings (loss) from continuing operations	\$ 1,105.3	\$ 13,527.5	\$ (1,525.1)
Income tax expense (benefit)	318.9	473.3	(275.9)
Other income, net	(134.4)	(44.9)	(76.2)
Gain on AtlasEdge JV Transactions	—	(227.5)	—
Gain on U.K. JV Transaction	—	(10,873.8)	—
Gain on Telenet Tower Sale	(700.5)	—	—
Share of results of affiliates, net	1,267.8	175.4	245.3
Losses (gains) on debt extinguishment, net	(2.8)	90.6	233.2
Realized and unrealized losses (gains) due to changes in fair values of certain investments, net	302.1	(735.0)	(45.2)
Foreign currency transaction losses (gains), net	(1,407.2)	(1,324.5)	1,409.3
Realized and unrealized losses (gains) on derivative instruments, net	(1,191.7)	(622.9)	878.7
Interest expense	589.3	882.1	1,186.8
Operating income	146.8	1,320.3	2,030.9
Impairment, restructuring and other operating items, net	85.1	(19.0)	97.4
Depreciation and amortization	2,171.4	2,353.7	2,227.2
Share-based compensation expense	192.1	308.1	348.0
Adjusted EBITDA	<u>\$ 2,595.4</u>	<u>\$ 3,963.1</u>	<u>\$ 4,703.5</u>

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,	
	2022	2021	2022	2021
in millions				
Switzerland	\$ 10,913.0	\$ 11,533.8	\$ 13,095.6	\$ 13,812.9
Belgium	5,736.5	5,652.3	8,875.0	6,885.7
Ireland	799.1	775.3	1,070.8	894.8
Central and Other	717.4	889.1	19,853.6	25,323.6
Total	<u>\$ 18,166.0</u>	<u>\$ 18,850.5</u>	<u>\$ 42,895.0</u>	<u>\$ 46,917.0</u>
VMO2 JV	<u>\$ 41,087.5</u>	<u>\$ 51,689.8</u>	<u>\$ 49,809.3</u>	<u>\$ 60,431.6</u>
VodafoneZiggo JV	<u>\$ 17,845.3</u>	<u>\$ 19,651.2</u>	<u>\$ 20,211.9</u>	<u>\$ 21,288.5</u>

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2022, 2021 and 2020

Property and Equipment Additions of our Reportable Segments

The property and equipment additions of our reportable segments (including capital additions financed under capital-related vendor financing or finance lease arrangements) are presented below and reconciled to the capital expenditure amounts included in our consolidated statements of cash flows. For additional information concerning capital additions financed under vendor financing and finance lease arrangements, see notes 10 and 12, respectively.

	Year ended December 31,		
	2022	2021	2020
	in millions		
Switzerland	\$ 575.7	\$ 609.9	\$ 302.8
Belgium	616.0	573.5	513.6
U.K. (a)	—	557.4	1,347.2
Ireland	137.3	94.4	85.6
Central and Other (b)	259.9	334.3	354.4
Total property and equipment additions	1,588.9	2,169.5	2,603.6
Assets acquired under capital-related vendor financing arrangements	(182.8)	(661.1)	(1,339.6)
Assets acquired under finance leases	(34.2)	(42.6)	(48.7)
Changes in current liabilities related to capital expenditures	(68.7)	(57.8)	77.5
Total capital expenditures, net	<u>\$ 1,303.2</u>	<u>\$ 1,408.0</u>	<u>\$ 1,292.8</u>
Property and equipment additions:			
VMO2 JV (c)	<u>\$ 2,785.0</u>	<u>\$ 1,706.4</u>	<u>\$ —</u>
VodafoneZiggo JV	<u>\$ 999.3</u>	<u>\$ 990.5</u>	<u>\$ 918.7</u>

- (a) Amounts represent the property and equipment additions of the U.K. JV Entities through the June 1, 2021 closing of the U.K. JV Transaction.
- (b) Includes (i) property and equipment additions representing centrally-owned assets that benefit our operating segments, (ii) the net impact of certain centrally-procured network equipment that is ultimately transferred to our operating segments and (iii) property and equipment additions of our operations in Slovakia.
- (c) The 2021 amount represents the property and equipment additions of the VMO2 JV for the period beginning June 1, 2021.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2022, 2021 and 2020

Revenue by Major Category

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

	Year ended December 31,		
	2022	2021	2020
in millions			
Residential revenue:			
Residential fixed revenue (a):			
Subscription revenue (b):			
Broadband internet	\$ 1,378.2	\$ 2,371.7	\$ 3,181.9
Video	1,077.4	1,831.8	2,446.2
Fixed-line telephony	381.4	841.1	1,328.2
Total subscription revenue	2,837.0	5,044.6	6,956.3
Non-subscription revenue	94.5	161.2	217.3
Total residential fixed revenue	2,931.5	5,205.8	7,173.6
Residential mobile revenue (c):			
Subscription revenue (b)	1,401.4	1,630.7	1,090.3
Non-subscription revenue	543.7	760.8	691.5
Total residential mobile revenue	1,945.1	2,391.5	1,781.8
Total residential revenue	4,876.6	7,597.3	8,955.4
B2B revenue (d):			
Subscription revenue	515.1	619.0	563.9
Non-subscription revenue	861.7	1,243.8	1,431.5
Total B2B revenue	1,376.8	1,862.8	1,995.4
Other revenue (e)	942.3	851.2	594.6
Total	\$ 7,195.7	\$ 10,311.3	\$ 11,545.4

- (a) Residential fixed subscription revenue includes amounts received from subscribers for ongoing services and the recognition of deferred installation revenue over the associated contract period. Residential fixed non-subscription revenue includes, among other items, channel carriage fees, late fees and revenue from the sale of equipment.
- (b) Residential subscription revenue from subscribers who purchase bundled services at a discounted rate is generally allocated proportionally to each service based on the standalone price for each individual service. As a result, changes in the standalone pricing of our fixed and mobile products or the composition of bundles can contribute to changes in our product revenue categories from period to period.
- (c) Residential mobile subscription revenue includes amounts received from subscribers for ongoing services. Residential mobile non-subscription revenue includes, among other items, interconnect revenue and revenue from sales of mobile handsets and other devices.
- (d) B2B subscription revenue represents revenue from (i) services provided to small or home office (SOHO) subscribers and (ii) mobile services provided to medium and large enterprises. SOHO subscribers pay a premium price to receive expanded service levels along with broadband internet, video, fixed-line telephony or mobile services that are the same or similar to the mass marketed products offered to our residential subscribers. B2B non-subscription revenue includes (a) revenue from business broadband internet, video, fixed-line telephony and data services offered to medium and large enterprises and, fixed-line and mobile services on a wholesale basis, to other operators and (b) revenue from long-term leases of portions of our network.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2022, 2021 and 2020

- (e) Other revenue includes, among other items, (i) revenue earned from the U.K. JV Services and NL JV Services, (ii) broadcasting revenue in Belgium and Ireland, (iii) revenue earned from transitional and other services provided to various third parties and (iv) revenue earned from the sale of CPE to the VodafoneZiggo JV.

Geographic Segments

The revenue of our geographic segments is set forth below:

	Year ended December 31,		
	2022	2021	2020
in millions			
Switzerland	\$ 3,180.9	\$ 3,321.9	\$ 1,573.8
Belgium	2,807.3	3,065.9	2,940.9
U.K. (a)	—	2,736.4	6,076.9
Ireland	494.7	550.0	513.7
Slovakia	49.9	52.3	50.7
Other, including intersegment eliminations (b)	662.9	584.8	389.4
Total	\$ 7,195.7	\$ 10,311.3	\$ 11,545.4
VMO2 JV (U.K.) (c)	<u>\$ 12,857.2</u>	<u>\$ 8,522.9</u>	<u>\$ —</u>
VodafoneZiggo JV (the Netherlands)	<u>\$ 4,284.6</u>	<u>\$ 4,824.2</u>	<u>\$ 4,565.4</u>

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

- (b) Primarily relates to revenue associated with our Central functions, most of which is located in the Netherlands and the U.K.

- (c) The 2021 amount represents the revenue of the VMO2 JV for the period beginning June 1, 2021.

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

	December 31,	
	2022	2021
in millions		
Switzerland	\$ 10,913.0	\$ 11,533.8
Belgium	5,736.5	5,652.3
Ireland	799.1	775.3
Slovakia	116.5	123.5
Other (a)	600.9	765.6
Total	\$ 18,166.0	\$ 18,850.5
VMO2 JV (U.K.)	<u>\$ 41,087.5</u>	<u>\$ 51,689.8</u>
VodafoneZiggo JV (the Netherlands)	<u>\$ 17,845.3</u>	<u>\$ 19,651.2</u>

- (a) Primarily relates to certain long-lived assets associated with our Central functions located in the Netherlands, the U.K. and the U.S.

(20) Subsequent Event

On February 13, 2023, we announced that we acquired a 4.92% interest in Vodafone, representing 1,335,000,000 Vodafone shares at an average purchase price of £0.9195 (\$1.1151 at the applicable rate) per share. The aggregate purchase price of £1,227.6 million (\$1,488.7 million at the applicable rate) was funded with \$271.3 million of cash on hand and the remainder through a transaction (the **Vodafone Collar Transaction**). The Vodafone Collar Transaction includes a loan in the amount of \$1,217.4 million and a collar on the 1,335,000,000 Vodafone shares. The Vodafone Collar Transaction allows us to realize a potential gain from an increase in the Vodafone share price up to a cap and hedges our potential loss from a decline of Vodafone's share price below a floor. This is accomplished by call options the counterparty can exercise at the cap price and put options we can exercise at the floor price. We will remain subject to changes in the Vodafone share price between the cap and the floor. The Vodafone Collar Transaction does not subject us to margin calls or capital calls, is fully collateralized by the Vodafone shares, and is structured such that we will never have a net payment obligation to the counterparty, making the transaction effectively non-recourse to us beyond the Vodafone shares. We will retain a portion of the dividends on the Vodafone shares, which we currently expect to be around 28%, but does vary based on the value of the collar on the ex-dividend date. The Vodafone Collar Transaction has settlement dates from July 2025 to December 2026, contains no financial covenants and provides for customary representations and warranties, events of default and certain adjustment and termination events.

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 2023 Annual Meeting of Shareholders, which we intend to hold during the second quarter of 2023.

Item 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Item 11. EXECUTIVE COMPENSATION

Item 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by Item 201(d) of Regulation S-K is included below and accordingly will not be incorporated by reference to our definitive proxy statement.

Item 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

Item 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

Our independent registered public accounting firm is KPMG LLP, Denver, CO
Auditor Firm ID: 185

We intend to file our definitive proxy statement for our 2023 Annual Meeting of Shareholders with the Securities and Exchange Commission on or before April 28, 2023.

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, 2022 with respect to our ordinary shares that are authorized for issuance under our equity compensation plans.

Equity Compensation Plan Information

<u>Plan Category</u>	<u>Number of securities to be issued upon exercise of outstanding options, warrants and rights (1)(2)</u>	<u>Weighted average exercise price of outstanding options, warrants and rights (1)(2)</u>	<u>Number of securities available for future issuance under equity compensation plans (excluding securities reflected in the first column)</u>
Equity compensation plans approved by security holders:			
Liberty Global 2014 Incentive Plan (3):			
Total ordinary shares available for issuance			49,782,418
Liberty Global Class A ordinary shares	23,454,744	\$ 27.03	
Liberty Global Class C ordinary shares	51,951,842	\$ 26.34	
Liberty Global 2014 Nonemployee Director Incentive Plan (4):			
Total ordinary shares available for issuance			7,336,388
Liberty Global Class A ordinary shares	564,816	\$ 30.08	
Liberty Global Class C ordinary shares	2,322,610	\$ 25.75	
Liberty Global 2005 Incentive Plan (5):			
Liberty Global Class A ordinary shares	2,550,977	\$ 28.12	
Liberty Global Class C ordinary shares	7,525,689	\$ 23.76	
Liberty Global 2005 Director Incentive Plan (5):			
Liberty Global Class A ordinary shares	43,442	\$ 29.25	
Liberty Global Class C ordinary shares	136,784	\$ 27.46	
VM Incentive Plan (5):			
Liberty Global Class A ordinary shares	81,405	\$ 29.09	
Liberty Global Class C ordinary shares	374,918	\$ 26.75	
Equity compensation plans not approved by security holders:			
None	—		—
Totals:			
Total ordinary shares available for issuance			57,118,806
Liberty Global Class A ordinary shares	26,695,384		
Liberty Global Class C ordinary shares	62,311,843		

- (1) This table includes (i) SARs and PSARs with respect to 22,684,953 and 3,396,219 Liberty Global Class A shares, respectively, and 53,065,355 and 6,645,848 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, 2022 and excluding any related tax effects, 549,381 and 1,592,240 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, 2022. 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 awards under the various incentive plans with respect to an aggregate of 2,017,244, 7,890 and 4,035,148, 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, 2022, an aggregate of 49,782,418 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, 2022, an aggregate of 7,336,388 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 2014 Incentive Plans 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-42 of this Annual Report on Form 10-K.

(a) (2) FINANCIAL STATEMENT SCHEDULES

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

Schedule I - Condensed Financial Information of Registrant (Parent Company Information):

Liberty Global plc Condensed Balance Sheets as of December 31, 2022 and 2021 (Parent Company Only) [IV-8](#)

Liberty Global plc Condensed Statements of Operations for the years ended December 31, 2022, 2021 and 2020 (Parent Company Only) [IV-9](#)

Liberty Global plc Condensed Statements of Cash Flows for the years ended December 31, 2022, 2021 and 2020 (Parent Company Only) [IV-10](#)

Schedule II - Valuation and Qualifying Accounts

[IV-11](#)

(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, Telefonica, S.A., and Telefonica O2 Holdings Limited \(incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed May 13, 2020 \(File No. 001-35961\)\).***](#)

2.3 [Transaction Agreement, dated as of August 12, 2020 between Liberty Global plc and Sunrise Communications Group AG \(incorporated by reference to Exhibit 2.1 to the Registrant's Quarterly Report on Form 10-Q filed November 4, 2020 \(File No. 001-35961\)\).](#)

2.4 [Sale and Purchase Agreement, dated as of September 22, 2021, by and among Liberty Global plc, UPC Poland Holding B.V., P4 sp.z o.o. and Iliad S.A. \(incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed September 23, 2021 \(File No. 001-35961\)\).***](#)

3 -- Articles of Incorporation and Bylaws:

3.1 [Articles of Association of Liberty Global plc, effective as of July 1, 2015 \(incorporated by reference to Exhibit 3.1 to the Registrant's Registration Statement on Form 8-A filed June 19, 2015 \(File No. 001-35961\)\).](#)

4 -- Instruments Defining the Rights of Securities Holders, including Indentures:

4.1 [Description of the Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934 \(incorporated by reference to Exhibit 4.1 to the Registrant's Annual Report on Form 10-K filed February 13, 2020 \(File No. 001-35961\)\).](#)

4.2 [Amended Credit Agreement to Senior Secured Credit Facility Agreement originally dated January 16, 2004, dated November 29, 2017, among UPC Broadband Holding B.V. \(UPC Broadband Holding\) as Borrower, The Bank of Nova Scotia, as Facility Agent, the Guarantors listed therein, the Security Agent and the bank and financial institutions acceding thereto from time to time \(the UPC Broadband Holding Bank Facility\) \(incorporated by reference to Schedule 2 of Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed December 5, 2017 \(File No. 001-35961\)\)\(the December 2017 8-K\).](#)

4.3 [Supplemental Deed dated November 29, 2017, between UPC Broadband Holding, as Obligor, and the Bank of Nova Scotia, as Facility Agent and Security Agent, which is supplemental to and amends the UPC Broadband Holding Bank Facility \(incorporated by reference to Exhibit 4.1 to the December 2017 8-K\).](#)

4.4 [Indenture dated April 15, 2015, among UPCB Finance IV Limited, The Bank of New York Mellon, London Branch as Trustee, Principal Paying Agent, Transfer Agent and Security Agent, The Bank of New York Mellon as New York Paying Agent, New York Transfer Agent and Dollar Notes Registrar and The Bank of New York Mellon \(Luxembourg\) S.A. as Euro Notes Registrar and Transfer Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed April 21, 2015 \(File No. 001-35961\) \(the April 2015 8-K/A\)\).](#)

- 4.5 [Additional Facility AK Accession Agreement, dated April 15, 2015, among UPC Financing Partnership \(UPC Financing\) as Borrower, The Bank of Nova Scotia as Facility Agent and Security Agent, UPC Broadband Holding and UPCB Finance IV Limited as Additional Facility AK Lender, under the UPC Broadband Holding Bank Facility \(incorporated by reference to Exhibit 4.2 to the April 2015 8-K/A\).](#)
- 4.6 [Additional Facility AL Accession Agreement, dated April 15, 2015, among UPC Financing as Borrower, The Bank of Nova Scotia as Facility Agent and Security Agent, UPC Broadband Holding and UPCB Finance IV Limited as Additional Facility AL Lender, under the UPC Broadband Holding Bank Facility \(incorporated by reference to Exhibit 4.3 to the April 2015 8-K/A\).](#)
- 4.7 [Additional Facility AL2 Accession Agreement, dated May 20, 2015, among UPC Financing as Borrower, The Bank of 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, 2019 \(File No. 001-35961\)\).](#)
- 4.18 [Indenture dated December 13, 2017 between Telenet Finance Luxembourg Notes S.a.r.l., The Bank of New York Mellon, London Branch, as Trustee and Security Trustee and The Bank of New York Mellon SA/NV, Luxembourg Branch, as Transfer Agent and Registrar \(incorporated by reference to Exhibit 4.4 to the Registrant's Current Report on Form 8-K filed December 18, 2017 \(File No. 000.35961\)\)\(the December 2017 8-K/A\).](#)
- 4.19 [Additional Facility AJ Accession Agreement dated December 13, 2017 and entered into between, among others, Telenet International Finance S.a.r.l. as the Borrower, Telenet Financing USD LLC as a Guarantor, The Bank of Nova Scotia as Facility Agent and KBC Bank NV as Security Agent \(incorporated by reference to Exhibit 4.5 to the December 2017 8-K/A\).](#)
- 4.20 [Additional Facility AK Accession Agreement dated December 13, 2017 and entered into between, among others, Telenet International Finance S.a.r.l. as the Borrower, Telenet Financing USD LLC as a Guarantor, The Bank of Nova Scotia as Facility Agent and KBC Bank NV as Security Agent \(incorporated by reference to Exhibit 4.6 to the December 2017 8-K/A\).](#)

- 4.21 [Telenet Supplemental Agreement \(Credit Agreement\) dated November 16, 2018 between among others, Telenet BVBA as the company, The Bank of Nova Scotia as facility agent and KBC Bank NV as security agent \(incorporated by reference to Exhibit 4.1 to the November 2018 8-K\).](#)
- 4.22 [Indenture dated March 28, 2014 between Virgin Media Secured Finance PLC, The Bank of New York Mellon, London Branch, as Trustee, Transfer Agent and Principal Paying Agent, The Bank of New York Mellon as Paying Agent, and The Bank of New York Mellon \(Luxembourg\) S.A., as Registrar \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed April 3, 2014 \(File No. 001-35961\)\).](#)
- 4.23 [Indenture dated January 28, 2015 between Virgin Media Finance PLC, The Bank of New York Mellon, London Branch, as Trustee and Principal Paying Agent, The Bank of Mellon as Paying Agent and Dollar Notes Transfer Agent and Registrar and The Bank of New York Mellon \(Luxembourg\) S.A., as Euro Notes Registrar and Transfer Agent \(incorporated by reference to Exhibit 4.2 to the February 2015 8-K/A\).](#)
- 4.24 [Additional L Facility Accession Deed dated November 10, 2017, between Virgin Media Investment Holdings Limited as the Company, Virgin Media SFA Finance Limited as the Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional L Facility Lender under the VMF Senior Facilities Agreement \(incorporated by reference to Exhibit 4.2 to the November 2017 8-K\).](#)
- 4.25 [Additional M Facility Accession Deed dated November 10, 2017, between Virgin Media Investment Holdings Limited as the Company, Virgin Media SFA Finance Limited as the Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional M Facility Lender under the VMF Senior Facilities Agreement \(incorporated by reference to Exhibit 4.3 to the November 2017 8-K\).](#)
- 4.26 [Additional N Facility Accession Deed dated October 4, 2019, between Virgin Media Investment Holdings Limited as the Company, Virgin Media Bristol LLC as the Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional N Facility Lender \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed October 10, 2019 \(File No. 001-35961\) \(the October 10, 2019 8-K\)\).](#)
- 4.27 [Additional O Facility Accession Deed dated October 4, 2019, between Virgin Media Investment Holdings Limited as the Company, Virgin Media SFA Finance Limited as the Facility O Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional O Facility Lender \(incorporated by reference to Exhibit 4.2 to the October 10, 2019 8-K\).](#)
- 4.28 [Facility P Accession Deed dated December 7, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and the Additional Facility P Lenders \(as defined therein\) \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed December 11, 2020 \(File No. 001-35961\)\).](#)
- 4.29 [Additional Facility Q Accession Deed dated September 11, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, Virgin Media Bristol LLC as Borrower, The Bank of Nova Scotia as the Facility Agent and the Additional Facility Q Lenders \(as defined therein\) \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed September 16, 2020 \(the September 16, 2020 8-K\)\).](#)
- 4.30 [Additional Facility R Accession Deed dated September 11, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and the Additional Facility R Lenders \(as defined therein\) \(incorporated by reference to Exhibit 4.2 to the September 16, 2020 8-K\).](#)
- 4.31 [Additional Facility S Accession Deed dated September 24, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and VMED O2 UK Financing I plc as the Additional Facility S Lender \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed September 30, 2020 \(the September 30, 2020 8-K\)\).](#)
- 4.32 [Additional Facility T Accession Deed dated September 24, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and VMED O2 UK Financing I plc as the Additional Facility T Lender \(incorporated by reference to Exhibit 4.2 to the September 30, 2020 8-K\).](#)
- 4.33 [Additional Facility U Accession Deed dated September 24, 2020 and entered into between Virgin Media Investment Holdings Limited as the Company, VMED O2 UK Holdco 4 Limited as Borrower, The Bank of Nova Scotia as the Facility Agent and VMED O2 UK Financing I plc as the Additional Facility U Lender \(incorporated by reference to Exhibit 4.3 to the September 30, 2020 8-K\).](#)
- 4.34 [Additional Facility AV2 Accession Agreement dated April 12, 2021 and entered into between, among others, UPC Financing Partnership as the Borrower and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed April 16, 2021 \(File no. 001-35961\) \(the April 16, 2021 8-K\)\).](#)
- 4.35 [Additional Facility AW2 Accession Agreement dated April 12, 2021 and entered into between, among others, UPC Broadband Holding B.V. as the Borrower and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.2 to the April 16, 2021 8-K\).](#)
- 4.36 [Amended Credit Agreement dated April 12, 2021 and entered into between, among others, UPC Broadband and Upsizing Revolving Facility lenders \(named therein\) and The Bank of Nova Scotia as the Facility Agent and Security Agent \(incorporated by reference to Exhibit 4.3 to the April 16, 2021 8-K\).](#)

- 4.37 [Additional Facility AX Accession Agreement dated April 20, 2021 and entered into between, among others, UPC Financing Partnership as the Borrower and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed April 26, 2021 \(File no. 001-35961\) \(the April 26, 2021 8-K\).](#)
- 4.38 [Additional Facility AY Accession Agreement dated April 20, 2021 and entered into between, among others, UPC Broadband Holding B.V. as the Borrower and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.2 to the April 26, 2021 8-K\).](#)
- 4.39 [Additional Facility AZ Accession Agreement dated April 21, 2021 and entered into between, among others, UPC Broadband Holding B.V. as the Company, UPC Financing Partnership as the Borrower, The Bank of Nova Scotia as the Facility Agent and UPC Broadband Finco B.V. as the Additional Facility AZ Lender \(incorporated by reference to Exhibit 4.3 to the April 26, 2021 8-K\).](#)
- 4.40 [Amendment and Restatement Agreement dated December 9, 2019 between Virgin Media Investment Holdings Limited \(for itself and as agent on behalf of the other obligors\) and The Bank of Nova Scotia \(as facility agent\), and attached as a schedule thereto, a copy of the Senior Facilities Agreement, originally dated June 7, 2013, between, among others, Virgin Media Investment Holdings Limited as a borrower and a guarantor, The Bank of Nova Scotia as facility agent and Deutsche Bank AG, London Branch as security trustee as amended and restated by the Amendment and Restatement Agreement \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed December 13, 2019 \(File No. 001-35961\)\).](#)
- 4.41 [Indenture dated May 16, 2019, among Virgin Media Secured Finance PLC, as Issuer, BNY Mellon Corporate Trustee Services Limited as Trustee, The Bank of New York Mellon, London Branch, as Principal Paying Agent and The Bank of New York Mellon SA/NV, Luxembourg Branch, as Registrar and Transfer Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed May 17, 2019 \(File No. 001-35961\)\).](#)
- 4.42 [Supplemental Indenture, dated as of July 5, 2019, between Virgin Media Secured Finance PLC as Issuer and BNY Mellon Corporate Trustee Services Limited as Trustee, to the Indenture dated May 16, 2019 for 5.50% Senior Secured Notes and 5.25% Senior Secured Notes, each due 2029 \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed July 9, 2019 \(File No. 001-35961\)\).](#)
- 4.43 [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 \(File No. 001-35961\) \(the November 2019 10-Q\)\).](#)
- 4.44 [Supplemental Agreement dated April 6, 2020 between, among others, Telenet BV as company, The Bank of Nova Scotia as facility agent and KBC Bank NV as security agent and attached as a schedule thereto, a copy of the Amended and Restated Credit Agreement dated April 6, 2020, between, among others, Telenet BV as original borrower and The Bank of Nova Scotia as facility agent and KBC Bank NV as security agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed April 10, 2020 \(File No. 001-35961\)\).](#)
- 4.45 [Supplemental Deed dated April 23, 2020 between, among others, UPC Broadband Holding B.V. as Obligors' Agent and The Bank of Nova Scotia as facility agent and security agent and, attached as a schedule thereto, a copy of the Amended Senior Facilities Agreement dated April 23, 2020 between, among others, UPC Broadband Holding B.V. as borrower and The Bank of Nova Scotia as facility agent and security agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed April 29, 2020 \(File No. 001-35961\)\).](#)
- 4.46 [Supplemental Deed dated May 23, 2022 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 May 23, 2022 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 May 25, 2022 \(File No. 001-35961\)\).](#)

The Registrant undertakes to furnish to the Securities and Exchange Commission, upon request, a copy of all instruments with respect to long-term debt not filed herewith.

10 -- Material Contracts:

- 10.1 [Deed of Assumption of Liberty Global plc, dated June 7, 2013 \(incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed June 7, 2013 \(File No. 001-35961\)\(the June 7, 2013 8-K\)\).](#)
- 10.2+ [Liberty Global 2014 Incentive Plan \(Amended and Restated effective June 11, 2019 \(as amended and restated from time to time, the Incentive Plan\) \(incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed August 8, 2019 \(File No. 001-35961\) \(the August 2019 10-Q\)\).](#)
- 10.3+ [Liberty Global 2014 Nonemployee Director Incentive Plan Effective March 1, 2014 \(the Director Plan\) \(incorporated by reference to Appendix B to the Registrant's Proxy Statement on Schedule 14A filed December 19, 2013 \(File No. 001-35961\)\).](#)

- 10.4+ [Form of Non-Qualified Share Option Agreement under the Director Plan \(incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed August 5, 2014 \(File No. 001-35961\) \(the August 5, 2014 10-Q\)\).](#)
- 10.5+ [Form of Restricted Share Units Agreement under the Director Plan \(incorporated by reference to Exhibit 10.4 to the August 5, 2014 10-Q\).](#)
- 10.6+ [Liberty Global, Inc. 2005 Incentive Plan \(as amended and restated effective June 7, 2013\) \(the 2005 Incentive Plan\) \(incorporated by reference to Exhibit 10.2 to the June 7, 2013 8-K\).](#)
- 10.7+ [Liberty Global, Inc. 2005 Nonemployee Director Incentive Plan \(as amended and restated effective June 7, 2013\) \(the 2005 Director Plan\) \(incorporated by reference to Exhibit 10.3 to the June 7, 2013 8-K\).](#)
- 10.8+ [Virgin Media 2010 Stock Incentive Plan \(as amended and restated effective June 7, 2013\) \(incorporated by reference to Exhibit 10.4 to the June 7, 2013 8-K\).](#)
- 10.9+ [Form of Non-Qualified Share Option Agreement under the 2005 Director Plan \(incorporated by reference to Exhibit 10.6 to the Registrant's Quarterly Report on Form 10-Q filed August 1, 2013 \(File No. 001-35961\)\).](#)
- 10.10+ [Liberty Global Compensation Policy for Nonemployee Directors effective June 21, 2017 \(incorporated by reference to Appendix A to the Registrant's Proxy Statement on Schedule 14A filed May 1, 2017 \(File No. 001-35961\)\).](#)
- 10.11+ [Form of Deed of Indemnity between Liberty Global and its Directors and Executive Officers \(incorporated by reference to Exhibit 10.10 to the June 7, 2013 8-K\).](#)
- 10.12+ [Form of Stock Appreciation Rights Agreement under the 2005 Incentive Plan \(incorporated by reference to Exhibit 10.3 to Liberty Global, Inc.'s \(LGI\) Quarterly Report on Form 10-Q filed May 7, 2008 \(File No. 000-51360\)\).](#)
- 10.13+ [Form of Performance Share Units Agreement for executive officers under the Incentive Plan \(incorporated by reference to Exhibit 10.16 to the Registrant's Annual Report on Form 10-K filed February 27, 2019 and amended on Form 10-K/A filed March 27, 2019 \(File No. 001-35961\) \(the 2019 10-K\)\).](#)
- 10.14+ [Liberty Global 2019 Challenge Performance Award program for senior management, including our executive officers under the Incentive Plan \(a description of said program is incorporated by reference to the description thereof included in Item 5.02\(e\) of the Registrant's Current Report on Form 8-K filed March 13, 2019 \(File No. 001-35961\)\).](#)
- 10.15+ [Liberty Global 2020 Annual Performance Award Program for executive officers under the Incentive Plan \(description of said plan is incorporated by reference to the description thereof included in Item 5.02\(e\) of the Registrant's Current Report on Form 8-K filed April 3, 2020 \(File No. 001-35961\)\).](#)
- 10.16+ [Deferred Compensation Plan \(adopted effective December 15, 2008; Amended and Restated as of October 26, 2015\)\(incorporated by reference to Exhibit 10.29 to the Registrant's Annual Report on Form 10-K filed February 16, 2016 \(File No. 001-35961\) \(the 2016 10-K\)\).](#)
- 10.17+ [Nonemployee Director Deferred Compensation Plan \(As Amended and Restated Effective December 11, 2015\)\(incorporated by reference to Exhibit 10.30 to the 2016 10-K\).](#)
- 10.18+ [Personal Usage of Aircraft Policy, restated June 7, 2013 \(incorporated by reference to Exhibit 10.31 to the 2016 10-K\).](#)
- 10.19+ [Form of Aircraft Time Sharing Agreement \(7X\) \(incorporated by reference to Exhibit 10.29 to LGI's Annual Report on Form 10-K filed February 13, 2013 \(File No. 000-51360\)\).](#)
- 10.20+ [Form of Share Appreciation Rights Agreement between the Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed August 4, 2016 \(File No. 001-35961\)\).](#)
- 10.21+ [Executive Service Agreement, dated December 15, 2004, between UPC Services Limited and Charles Bracken \(incorporated by reference to Exhibit 10.36 to LGI's Annual Report on Form 10-K filed February 24, 2010 \(File No. 000-51360\)\).](#)
- 10.22+ [Employment Agreement dated as of June 28, 2018, between LGI and Enrique Rodriguez \(incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed August 8, 2018 \(File No. 001-35961\)\).](#)
- 10.23+ [Amended and Restated Employment Agreement dated as of April 30, 2019, by and among the Registrant, Liberty Global Inc. and Michael T. Fries \(incorporated by reference to Exhibit 10.9 to the August 2019 10-Q\).](#)
- 10.24+ [Employment Agreement, dated May 21, 2020, by and between Liberty Global, Inc. and Bryan H. Hall \(incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed August 3, 2020 \(File No. 001-35961\) \(the August 2020 10-Q\)\).](#)
- 10.25+ [Employment Agreement, dated May 19, 2005, by and between Liberty Global Europe Limited \(formerly known as UGC Europe Services Ltd.\) and Andrea Salvato, assigned by Liberty Global Europe Limited to Liberty Global plc on November 1, 2013 \(incorporated by reference to Exhibit 10.3 to the August 2020 10-Q\).](#)
- 10.26+ [Form of Performance Share Appreciation Rights Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.2 to the August 2019 10-Q\).](#)
- 10.27+ [Form of Performance Restricted Share Units Agreement \(SHIP\) under the Incentive Plan \(incorporated by reference to Exhibit 10.4 to the August 2019 10-Q\).](#)
- 10.28+ [Form of Share Appreciation Rights Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.5 to the August 2019 10-Q\).](#)

- 10.29+ [Form of Performance Share Units Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.7 to the August 2019 10-Q\).](#)
- 10.30+ [Form of Performance Share Units Agreement between the Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.8 to the August 2019 10-Q\).](#)
- 10.31+ [Form of Share Appreciation Rights Agreement between Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.1 to the November 2019 10-Q\).](#)
- 10.32+ [Form of Performance Share Appreciation Rights Agreement between Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.2 to the November 2019 10-Q\).](#)
- 10.33+ [Form of Restricted Share Units Agreement \(SHIP\) under the Incentive Plan \(incorporated by reference to Exhibit 10.6 to the November 2019 10-Q\).](#)
- 10.34+ [Form of Restricted Share Units Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.3 to the November 2019 10-Q\).](#)
- 10.35+ [Form of Performance Restricted Share Units Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.4 to the November 2019 10-Q\).](#)
- 10.36+ [Form of Performance Restricted Share Units Agreement between Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.5 to the November 2019 10-Q\).](#)
- 10.37 [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. \(incorporated by reference to Exhibit 10.2 to the January 2017 8-K\).](#)
- 10.38 [Shareholders Agreement, dated June 1, 2021, by and among Liberty Global plc, Liberty Global Europe 2 Limited, Liberty Global Holdco Limited, Telefonica, S.A. and Telefonica O2 Holdings Limited \(incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed June 4, 2021 \(File No. 001-35961\)\).](#)
- 10.39+ [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 \(File No. 001-35961\)\).](#)
- 10.40+ [Liberty Global 2021 Long-Term Equity Incentive Program for executive officers under the Company's 2021 long-term incentive plan \(description of said plan is incorporated by reference to the description thereof included in Item 5.02\(e\) of Registrant's Current Report on Form 8-K filed April 15, 2021 \(File No. 001-35961\)\).](#)

[21 -- List of Subsidiaries*](#)

23 -- Consent of Experts and Counsel:

23.1 [Consent of KPMG LLP*](#)

31 -- Rule 13a-14(a)/15d-14(a) Certification:

31.1 [Certification of President and Chief Executive Officer*](#)

31.2 [Certification of Executive Vice President and Chief Financial Officer \(Principal Financial Officer\)*](#)

[32 -- Section 1350 Certification **](#)

101.SCH	Inline XBRL Taxonomy Extension Schema Document*
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document*
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase*
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document*
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document*
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)*

* Filed herewith

** Furnished herewith

*** Schedules and similar attachments to the agreement have been omitted pursuant to Item 601(a)(5) of Regulation S-K. The Registrant hereby undertakes to furnish supplemental copies of any of the omitted schedules and similar attachments upon request by the United States Securities and Exchange Commission

+ This document has been identified as a management contract or compensatory plan or arrangement.

Item 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

LIBERTY GLOBAL PLC

Dated: February 22, 2023

/s/ BRYAN H. HALL

Bryan H. Hall
Executive Vice President, General Counsel and Secretary

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the date indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ JOHN C. MALONE</u> John C. Malone	Chairman of the Board	February 22, 2023
<u>/s/ MICHAEL T. FRIES</u> Michael T. Fries	President, Chief Executive Officer and Director	February 22, 2023
<u>/s/ ANDREW J. COLE</u> Andrew J. Cole	Director	February 22, 2023
<u>/s/ MIRANDA CURTIS</u> Miranda Curtis	Director	February 22, 2023
<u>/s/ JOHN W. DICK</u> John W. Dick	Director	February 22, 2023
<u>/s/ PAUL A. GOULD</u> Paul A. Gould	Director	February 22, 2023
<u>/s/ RICHARD R. GREEN</u> Richard R. Green	Director	February 22, 2023
<u>/s/ LARRY E. ROMRELL</u> Larry E. Romrell	Director	February 22, 2023
<u>/s/ J. DAVID WARGO</u> J. David Wargo	Director	February 22, 2023
<u>/s/ MARISA DREW</u> Marisa Drew	Director	February 22, 2023
<u>/s/ DANIEL E. SANCHEZ</u> Daniel E. Sanchez	Director	February 22, 2023
<u>/s/ CHARLES H.R. BRACKEN</u> Charles H.R. Bracken	Executive Vice President and Chief Financial Officer	February 22, 2023
<u>/s/ JASON WALDRON</u> Jason Waldron	Senior Vice President and Chief Accounting Officer	February 22, 2023

LIBERTY GLOBAL PLC
SCHEDULE I
(Parent Company Information - See Notes to Consolidated Financial Statements)
CONDENSED BALANCE SHEETS
(Parent Company Only)

	December 31,	
	2022	2021
	in millions	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 1.8	\$ 1.7
Other receivables — related-party	89.8	31.3
Current notes receivable — related-party	0.8	0.8
Other current assets	7.5	30.5
Total current assets	99.9	64.3
Long-term notes receivable — related-party	190.0	455.4
Investments in consolidated subsidiaries, including intercompany balances	51,050.7	52,617.8
Other assets, net	16.8	6.7
Total assets	\$ 51,357.4	\$ 53,144.2
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 1.1	\$ 1.1
Other payables — related-party	78.5	72.0
Other current liabilities — related-party	0.6	—
Current portion of notes payable — related-party	12,590.2	11,281.7
Other accrued and current liabilities	25.0	23.9
Total current liabilities	12,695.4	11,378.7
Long-term notes payable — related-party	16,200.9	15,822.5
Other long-term liabilities	24.7	8.1
Total liabilities	28,921.0	27,209.3
Commitments and contingencies		
Shareholders' equity:		
Class A ordinary shares, \$0.01 nominal value. Issued and outstanding 171,917,370 and 174,310,558 shares, respectively	1.8	1.8
Class B ordinary shares, \$0.01 nominal value. Issued and outstanding 12,994,000 and 12,930,839 shares, respectively	0.1	0.1
Class C ordinary shares, \$0.01 nominal value. Issued and outstanding 274,436,585 and 340,114,729 shares, respectively	2.7	3.4
Additional paid-in capital	2,300.8	3,893.0
Accumulated earnings	19,617.7	18,144.5
Accumulated other comprehensive earnings, net of taxes	513.4	3,892.2
Treasury shares, at cost	(0.1)	(0.1)
Total shareholders' equity	22,436.4	25,934.9
Total liabilities and shareholders' equity	\$ 51,357.4	\$ 53,144.2

LIBERTY GLOBAL PLC
SCHEDULE I
(Parent Company Information - See Notes to Consolidated Financial Statements)
CONDENSED STATEMENTS OF OPERATIONS
(Parent Company Only)

	Year ended December 31,		
	2022	2021	2020
	in millions		
Operating costs and expenses:			
Selling, general and administrative (including share-based compensation)	\$ 55.7	\$ 77.6	\$ 58.8
Related-party fees and allocations	239.3	182.5	36.0
Depreciation and amortization	1.2	1.4	1.4
Operating loss	<u>(296.2)</u>	<u>(261.5)</u>	<u>(96.2)</u>
Non-operating income (expense):			
Interest expense — related-party	(1,308.7)	(1,185.6)	(1,086.9)
Interest income — related-party	15.1	31.7	45.1
Foreign currency transaction gains (losses), net	274.8	317.7	(330.2)
Realized and unrealized gains on derivative instruments, net	61.5	9.0	—
Other income, net	0.3	0.1	2.1
	<u>(957.0)</u>	<u>(827.1)</u>	<u>(1,369.9)</u>
Loss before income taxes and equity in earnings (loss) of consolidated subsidiaries, net	(1,253.2)	(1,088.6)	(1,466.1)
Equity in earnings (loss) of consolidated subsidiaries, net	2,726.4	14,530.5	(401.0)
Income tax benefit (expense)	—	(15.1)	239.1
Net earnings (loss)	<u>\$ 1,473.2</u>	<u>\$ 13,426.8</u>	<u>\$ (1,628.0)</u>

LIBERTY GLOBAL PLC
SCHEDULE I
(Parent Company Information - See Notes to Consolidated Financial Statements)
CONDENSED STATEMENTS OF CASH FLOWS
(Parent Company Only)

	Year ended December 31,		
	2022	2021	2020
	in millions		
Cash flows from operating activities:			
Net earnings (loss)	\$ 1,473.2	\$ 13,426.8	\$ (1,628.0)
Adjustments to reconcile net earnings (loss) to net cash used by operating activities:			
Equity in loss (earnings) of consolidated subsidiaries, net	(2,726.4)	(14,530.5)	401.0
Share-based compensation expense	28.4	49.4	30.4
Related-party fees and allocations	239.3	182.5	36.0
Depreciation and amortization	1.2	1.4	1.4
Realized and unrealized gains on derivative instruments, net	(61.5)	(9.0)	—
Foreign currency transaction losses (gains), net	(274.8)	(317.7)	330.2
Deferred income tax expense (benefit)	—	15.1	(15.1)
Changes in operating assets and liabilities:			
Receivables and other operating assets	138.5	85.3	(135.0)
Payables and accruals	654.7	709.9	865.9
Net cash used by operating activities	<u>(527.4)</u>	<u>(386.8)</u>	<u>(113.2)</u>
Cash flows from investing activities:			
Net cash received related to derivative instruments	50.0	—	—
Distributions and repayments from (investments in and advances to) consolidated subsidiaries, net	22.4	(274.8)	(494.1)
Cash released from the Vodafone Escrow Accounts, net	6.5	214.9	104.9
Other investing activities, net	—	(0.1)	(0.1)
Net cash provided (used) by investing activities	<u>78.9</u>	<u>(60.0)</u>	<u>(389.3)</u>
Cash flows from financing activities:			
Borrowings of related-party debt	2,187.8	2,445.3	2,087.5
Repayments of related-party debt	(26.5)	(443.3)	(483.2)
Repurchases of Liberty Global ordinary shares	(1,703.4)	(1,580.4)	(1,072.3)
Proceeds from the issuance of Liberty Global shares upon exercise of options	13.0	8.9	2.2
Other financing activities, net	(20.8)	(15.3)	(5.1)
Net cash provided by financing activities	<u>450.1</u>	<u>415.2</u>	<u>529.1</u>
Effect of exchange rate changes on cash and cash equivalents and restricted cash	(1.5)	0.1	(0.2)
Net increase (decrease) in cash and cash equivalents and restricted cash	0.1	(31.5)	26.4
Cash and cash equivalents and restricted cash:			
Beginning of year	6.8	38.3	11.9
End of year	<u>\$ 6.9</u>	<u>\$ 6.8</u>	<u>\$ 38.3</u>
Details of end of year cash and cash equivalents and restricted cash:			
Cash and cash equivalents	\$ 1.8	\$ 1.7	\$ 33.1
Restricted cash included in other current assets	5.1	5.1	5.2
Total cash and cash equivalents and restricted cash	<u>\$ 6.9</u>	<u>\$ 6.8</u>	<u>\$ 38.3</u>

LIBERTY GLOBAL PLC
SCHEDULE II
VALUATION AND QUALIFYING ACCOUNTS

Allowance for doubtful accounts — Trade receivables								
Balance at beginning of period	Impact of adoption of ASU 2014-09	Additions to costs and expenses	Acquisitions	Dispositions	Deductions or write-offs	Foreign currency translation adjustments	Balance at end of period	
in millions								
Year ended December 31:								
2020	\$ 41.7	1.4	81.8	19.4	(26.2)	(73.6)	3.8	\$ 48.3
2021	\$ 48.3	—	16.3	(1.6)	—	(18.5)	(2.5)	\$ 42.0
2022	\$ 42.0	—	30.8	—	—	(28.5)	(1.2)	\$ 43.1

Allowance for doubtful accounts — Loans to affiliates					
Balance at beginning of period	Impact of adoption of ASU 2016-13	Additions to costs and expenses	Foreign currency translation adjustments	Balance at end of period	
in millions					
Year ended December 31:					
2020	\$ —	25.4	10.3	2.8	\$ 38.5
2021	\$ 38.5	—	1.0	(2.3)	\$ 37.2
2022	\$ 37.2	—	(4.5)	(2.5)	\$ 30.2

Liberty Global plc Subsidiaries
December 31, 2022

Name	Country
Beluga Tree NV	Belgium
Caviar Antwerp BV	Belgium
Caviar Film Financing BV	Belgium
Caviar Group NV	Belgium
Connectify NV	Belgium
Décor Oyenbrug BV	Belgium
Doccle BV	Belgium
Doccle.Up NV	Belgium
Initials LA BV	Belgium
Loft International BV	Belgium
Loom BV	Belgium
MaRo NV	Belgium
Native Nation BV	Belgium
Roses Are Blue BV	Belgium
SBS Belgium NV	Belgium
Telenet BV	Belgium
Telenet Group Holding NV	Belgium
Telenet Group NV/SA	Belgium
Telenet Newco 1 BV	Belgium
Telenet Newco 2 BV	Belgium
Telenet Retail BV	Belgium
Telenet Vlaanderen NV	Belgium
The Park Entertainment NV	Belgium
Ucast BV	Belgium
Woestijnvis NV	Belgium
Liberty Global Ltd.	Bermuda
Caviar Paris SAS	France
Liberty Global Smart Sourcing GmbH	Germany
Unitymedia Finanz-Service GmbH	Germany
Casey Cablevision Limited	Ireland
Channel 6 Broadcasting Limited	Ireland
Cullen Broadcasting Limited	Ireland
Kish Media Limited	Ireland
P.B.N. Holdings Ltd	Ireland
Tullamore Beta Limited	Ireland
TVThree Enterprises Limited	Ireland
TVThree Sales Limited	Ireland

Name	Country
Ulana Business Management Ltd	Ireland
Virgin Media Ireland Limited	Ireland
Virgin Media Television Limited	Ireland
VMIE Group Holdings Limited	Ireland
6320 Canal SA	Luxembourg
Liberty Global Luxembourg Sàrl	Luxembourg
Liberty Property Holdco I Sàrl	Luxembourg
Telenet Finance Luxembourg Notes Sàrl	Luxembourg
Telenet International Finance Sàrl	Luxembourg
Telenet Luxembourg Finance Center Sàrl	Luxembourg
Telenet Solutions Luxembourg SA	Luxembourg
Liberty Global Holding Company Limited	Malta
Liberty Global Insurance Company Limited	Malta
Binan Investments BV	Netherlands
Labesa Holding BV	Netherlands
LGCI Holdco I BV	Netherlands
LGI Ventures BV	Netherlands
Liberty Global BV	Netherlands
Liberty Global Communication Services BV	Netherlands
Liberty Global Content Investments BV	Netherlands
Liberty Global Corporate BV	Netherlands
Liberty Global Europe Financing BV	Netherlands
Liberty Global Europe HoldCo 2 BV	Netherlands
Liberty Global Europe Holding BV	Netherlands
Liberty Global Europe Holding II BV	Netherlands
Liberty Global Europe Management BV	Netherlands
Liberty Global Holding BV	Netherlands
Liberty Global Switzerland HoldCo BV	Netherlands
Liberty Global Technology Services BV	Netherlands
Liberty Global Ventures Group Holding BV	Netherlands
Liberty Global Ventures Holding BV	Netherlands
Liberty Global Ventures Holding II BV	Netherlands
Liberty Networks Europe Holding BV	Netherlands
NewCo I BV	Netherlands
The Park Entertainment BV	Netherlands
UPC Broadband Finco BV	Netherlands
UPC Broadband Holding BV	Netherlands
UPC Holding BV	Netherlands
UPC Holding II BV	Netherlands
UPC Poland Holding BV	Netherlands
UPC Slovakia Group Holding BV	Netherlands

Name	Country
UPC Slovakia Holding I BV	Netherlands
UPC Slovakia Holding II BV	Netherlands
UPC Switzerland Holding BV	Netherlands
UPC Polska Holdco III Sp Zoo	Poland
Sunrise Portugal SA	Portugal
UPC Broadband Slovakia sro	Slovak Republic
ello communications SA	Switzerland
ITV Betriebsgesellschaft GmbH	Switzerland
Sitel SA	Switzerland
Sunrise GmbH	Switzerland
Swiss Open Fiber AG	Switzerland
TELDAS GmbH	Switzerland
Teledistal SA	Switzerland
Telelavaux SA	Switzerland
Catalyst NewCo 1 Limited	UK-England & Wales
Caviar London Limited	UK-England & Wales
Global Handset Finco Ltd	UK-England & Wales
LGCI Holdings Limited	UK-England & Wales
Liberty Global Broadband Germany Holding II Limited	UK-England & Wales
Liberty Global Broadband Germany Holding Limited	UK-England & Wales
Liberty Global Broadband Holding Limited	UK-England & Wales
Liberty Global Broadband I Limited	UK-England & Wales
Liberty Global Broadband II Limited	UK-England & Wales
Liberty Global Capital Asset Company Limited	UK-England & Wales
Liberty Global Capital Limited	UK-England & Wales
Liberty Global Development Limited	UK-England & Wales
Liberty Global Europe 2 Limited	UK-England & Wales
Liberty Global Europe Limited	UK-England & Wales
Liberty Global Finance I (UK) Limited	UK-England & Wales
Liberty Global Finance II (UK) Limited	UK-England & Wales
Liberty Global Financial Services Limited	UK-England & Wales
Liberty Global Management Services Limited	UK-England & Wales
Liberty Global Procurement Services Limited	UK-England & Wales
Liberty Global Property and Financial Services Limited	UK-England & Wales
Liberty Global SSC Limited	UK-England & Wales
Liberty Global Technology Limited	UK-England & Wales
Liberty Global Ventures Group Limited	UK-England & Wales
Liberty Global Ventures Holding Limited	UK-England & Wales
Liberty Global Ventures Limited	UK-England & Wales
Liberty Infrastructure Real Estate HoldCo Limited	UK-England & Wales
Newco Holdco 6 Limited	UK-England & Wales

Name	Country
Phoenix Renewables Ltd	UK-England & Wales
The Park Playground UK Limited	UK-England & Wales
Caviar LA, LLC	USA-California
Gifted Youth, LLC	USA-California
Imposter Inc.	USA-California
Learning Depot, LLC	USA-California
Loom, LLC	USA-California
Squirrel Rork Industries, LLC	USA-California
Stay Busy, LLC	USA-California
Vampire Productions, LLC	USA-California
LGI Technology Holdings Inc.	USA-Colorado
Liberty Global Management, LLC	USA-Colorado
Liberty Global Services, LLC	USA-Colorado
The Rider, LLC	USA-Colorado
UIM Aircraft, LLC	USA-Colorado
75 Sunset Films, LLC	USA-Delaware
Associated SMR, Inc.	USA-Delaware
LGCI HoldCo LP	USA-Delaware
LGI International LLC	USA-Delaware
LGI Ventures Management, Inc.	USA-Delaware
Liberty Global Holdings Inc.	USA-Delaware
Liberty Global, Inc.	USA-Delaware
Liberty Programming Japan, LLC	USA-Delaware
NewCo Financing Partnership	USA-Delaware
Roses Are Blue, Inc	USA-Delaware
Telenet Financing USD LLC	USA-Delaware
The Park Entertainment, Inc.	USA-Delaware
UnitedGlobalCom LLC	USA-Delaware
UPC Financing Partnership	USA-Delaware
VMIE Financing LLC	USA-Delaware

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the registration statements (No. 333-189220, 333-189222, 333-189223, 333-189224, 333-194578, 333-194581, 333-205542, 333-205543, and 333-254168) on Form S-8 of our reports dated February 22, 2023, with respect to the consolidated balance sheets of Liberty Global plc as of December 31, 2022 and 2021, 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, 2022, and the related notes and financial statement schedules I and II, and the effectiveness of internal control over financial reporting as of December 31, 2022, which reports appear in the December 31, 2022 annual report on Form 10-K of Liberty Global plc.

/s/ KPMG LLP

Denver, Colorado
February 22, 2023

CERTIFICATION

I, Michael T. Fries, certify that:

1. I have reviewed this annual report on Form 10-K of Liberty Global plc;
2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;
3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this annual report; The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and we have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this annual report our conclusions about the effectiveness of the disclosure controls and procedures as of the end of the period covered by this annual report based on such evaluation; and
 - d) Disclosed in this annual report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
4. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 22, 2023

/s/ Michael T. Fries

Michael T. Fries

President and Chief Executive Officer

CERTIFICATION

I, Charles H.R. Bracken, certify that:

1. I have reviewed this annual report on Form 10-K of Liberty Global plc;
2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;
3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this annual report; The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and we have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this annual report our conclusions about the effectiveness of the disclosure controls and procedures as of the end of the period covered by this annual report based on such evaluation; and
 - d) Disclosed in this annual report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
4. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 22, 2023

/s/ Charles H.R. Bracken

Charles H.R. Bracken

Executive Vice President and Chief Financial Officer

Certification
Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
(Subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code)

Pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code), each of the undersigned officers of Liberty Global plc (the "Company"), does hereby certify, to such officer's knowledge, that:

The Annual Report on Form 10-K for the year ended December 31, 2022 (the "Form 10-K") of the Company fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 and information contained in the Form 10-K fairly presents, in all material respects, the financial condition and results of operations of the Company as of December 31, 2022 and December 31, 2021, and for the years ended December 31, 2022, 2021 and 2020.

Dated: February 22, 2023 /s/ Michael T. Fries

Michael T. Fries
President and Chief Executive Officer

Dated: February 22, 2023 /s/ Charles H.R. Bracken

Charles H.R. Bracken
Executive Vice President and Chief Financial Officer

The foregoing certification is being furnished solely pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code) and is not being filed as part of the Form 10-K or as a separate disclosure document.