ABB

Financial Report 2023

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About ABB

ABB is a technology leader in electrification and automation, enabling a more sustainable and resource efficient future. The company's solutions connect engineering know-how and software to optimize how things are manufactured, moved, powered, and operated. Building on more than 140 years of excellence, ABB's more than 105,000 employees are committed to driving innovations that accelerate industrial transformation.

Organizational structure

We operate in approximately 100 countries across three regions: Europe, the Americas, and Asia, Middle East and Africa, and generate revenues in numerous currencies. We are headquartered in Zurich, Switzerland, and we govern our company through our four Business areas: Electrification, Motion, Process Automation, and Robotics & Discrete Automation. For a breakdown of our consolidated revenues (i) by Business area, (ii) by geographic region, and (iii) by product type, see "Analysis of results of operations—Revenues" and "Note 23 - Operating segment and geographic data" to our Consolidated Financial Statements.

Our principal corporate offices are located at Affolternstrasse 44, CH 8050 Zurich, Switzerland, telephone number +41 43 317 7111. Our agent for U.S. federal securities law purposes is ABB Holdings Inc., located at 305 Gregson Drive, Cary, North Carolina 27511. Our internet address is www.abb.com or global.abb. The information contained on or accessible from our Website is not incorporated into this annual report, and you should not consider it to be a part of this annual report. The United States Securities and Exchange Commission (SEC) maintains a website at www.sec.gov which contains in electronic form each of the reports and other information that we have filed electronically with the SEC.

Employees

A breakdown of our employees by geographic region is as follows:

December 31,	2023	2022	2021
Europe	51,400	49,700	50,000
The Americas	26,400	26,400	25,600
Asia, Middle East and Africa	30,100	29,000	28,800
Total	**107,900**	**105,100**	**104,400**

The proportion of our employees that are represented by labor unions or are subject to collective bargaining agreements varies based on the labor practices of each country in which we operate.

History of the ABB Group

The ABB Group was formed in 1988 through a merger between Asea AB and BBC Brown Boveri AG. Initially founded in 1883, Asea AB was a major participant in the introduction of electricity into Swedish homes and businesses and in the development of Sweden’s railway network. In the 1940s and 1950s, Asea AB expanded into the power, mining and steel industries. Brown Boveri and Cie. (later renamed BBC Brown Boveri AG) was formed in Switzerland in 1891 and initially specialized in power generation and turbines. In the early to mid-1900s, it expanded its operations throughout Europe and broadened its business operations to include a wide range of electrical engineering activities.

In January 1988, Asea AB and BBC Brown Boveri AG each contributed almost all of their businesses to the newly formed ABB Asea Brown Boveri Ltd, of which they each owned 50 percent. In 1996, Asea AB was renamed ABB AB and BBC Brown Boveri AG was renamed ABB AG. In February 1999, the ABB Group announced a group reconfiguration designed to establish a single parent holding company and a single class of shares. ABB Ltd was incorporated on March 5, 1999, under the laws of Switzerland. In June 1999, ABB Ltd became the holding company for the entire ABB Group. This was accomplished by having ABB Ltd issue shares to the shareholders of ABB AG and ABB AB, the two companies that formerly owned the ABB Group. The ABB Ltd shares were exchanged for the shares of those two companies, which, as a result of the share exchange and certain related transactions, became wholly-owned subsidiaries of ABB Ltd.

ABB Ltd shares are currently listed on the SIX Swiss Exchange and the NASDAQ OMX Stockholm Exchange. On May 12, 2023, we filed the required Form 25 with the SEC to delist ABB’s American Depositary Shares (ADSs) from trading on the New York Stock Exchange (NYSE). In connection with the delisting from the NYSE which became effective May 23, 2023, we converted our ADS program from a sponsored Level II program into a sponsored Level I program. The new Level I ADSs were assigned a new stock ticker (ABBNY) upon delisting and are now traded on the over-the-counter (OTC) markets.

ABB today

As a global technology leader in electrification and automation enabling sustainability and resource efficiency, our offering is relevant for the global transition towards low-carbon energy, increased energy efficiency, and the transition to more adaptive manufacturing and automation, putting us right in the center of long-term secular trends.

The ABB Purpose

ABB's purpose is to enable a more sustainable and resource-efficient future with our technology leadership in electrification and automation.

Our core competencies

Our leadership in resource efficiency is based on our core competencies, each of which constitutes a barrier to entry: decades-long domain expertise, cutting-edge technology and innovation as well as the ability to scale operations and distribution.

With its long history, ABB not only invented or pioneered many power and automation technologies but has retained technology and market leadership in many of these areas. Being present in various vertical markets for decades with close long-term relationships with customers and channel partners has resulted in our unique deep domain expertise, enabling a thorough understanding of customers' needs and operations.

We continuously evolve our offering to remain a relevant and trusted partner to our customers. Our annual non-order related research and development spending in 2023 amounted to approximately 4.1 percent of revenues. We focus our research and development expenditures on key areas of innovation and have spent approximately $9.2 billion since the beginning of 2016, focusing on developing best-in-class products and services in the fields of electrification and automation with the goal of helping our customers to create resource-efficient value.

All our four Business areas are market leaders in their respective areas being in either the number 1 or 2 position. Our global reach along with our extensive local presence assists us in scaling innovations to achieve stronger returns, which supports higher absolute investments for future growth. Active globally, our revenues are well-balanced across regions with customers served directly and through a strong channel partner network.

The ABB Way

The ABB Way is the glue that unites our Group and comprises a select number of common processes covering our business model, our people and culture, the ABB brand and our governance framework. It facilitates accountability, transparency and speed in ABB.

In our operating model, the divisions represent the highest level of operating decisions. They are closest to their respective markets and customer needs. Each division progresses through the strategic mandates and priorities of stability and profitability before growth. In order to deploy full focus on organic and acquired growth to the extent of consolidating the market, the business' structure should be robust and profitability should be at least in line with industry peers.

Each division has full accountability for its results and carries the responsibility for business development, and research and development for leading technology to secure a number 1 or 2 market position. During 2023 we cemented the decentralized way of working at ABB within all our divisions, ensuring accountability, transparency and speed in decision making. Our focus area in 2024 will be to increasingly shift our focus to profitable growth, and further increase the number of our divisions with this mandate. Strong performance management is key in a decentralized business model. We apply a monthly scorecard system for the divisions and Business areas, based on a standardized set of Key Performance Indicators, to support full transparency of operational performance. It is accompanied by a limited select number of short-term incentives, including the mandatory target to make annual productivity improvements of at least 3-5 percent each year.

The corporate functions focus on necessary strategic, financial and governance activities, with a lean headcount of approximately 800 employees.

Enhanced growth profile

Over the past several years, we have taken significant actions to align our business portfolio around our Purpose, resulting in all divisions now active only within the markets of electrification and automation. Both of these markets are benefiting from increasing global investments to decarbonize, increase energy efficiency and to automate and increase flexibility in society, including industrial manufacturing, buildings and process industries. Additionally, we have increased the proportion of sales stemming from short-cycle businesses, meaning a reduced proportion from project-related activities, which we believe should reduce the risk and volatility in our earnings. This ongoing shift towards better quality of revenues is now an integral part of governance and business execution.

The responsibility for growth has been fully transferred to the divisions, as they are closest to customers. This includes both organic and acquired growth. The divisions have the best insights into current and future customer needs and are accountable for building their respective business accordingly. With more divisions transitioning over time from stability and profitability to growth, we expect to see a gradual strengthening of our growth profile.

Finally, environmental, social and governance (ESG) drivers are accelerating and translating into increased demand for our electrification and automation offering. The demand for electricity is growing ten times as fast as other energy sources, resulting in approximately 50 percent higher average annual investments into distribution networks over the next seven years (source: IEA World Energy Outlook 2023, Announced Pledges Scenario). The share of low-carbon sources in the global energy mix is expected to increase to approximately 70 percent by 2050 from only 20 percent today (source: IEA World Energy Outlook 2023, Announced Pledges Scenario). The need to improve energy efficiency has never been more relevant, from both the perspective of sustainable operations and reducing operating costs in a high energy cost environment. Investments in energy efficiency are expected to increase 46 percent per year over the next seven years versus the seven previous years (source: IEA World Energy Outlook 2023, Announced Pledges Scenario). Today approximately 45 percent of the world's electricity is converted into motion by electric motors yet only approximately 20 percent of the world's electric motors are optimized through the control of drives. Lastly, the global number of working age people (25 to 64 years) per retiree (65 years or over) is expected to fall by about 20 percent over the next ten years (source: United Nations World Population Prospects 2019), supporting demand for robotics and automation solutions. We believe ABB's offering is well positioned to address these trends.

Businesses

Our markets

ABB is a technology leader in electrification and automation with a comprehensive digitalized offering of electrification, motion and automation solutions. Our exposure to customers is geographically balanced while catering to multiple end-markets and segments. We believe our customer offering is well positioned to benefit from secular growth drivers, including urbanization, labor shortage, shift to electrification, automation and robotization, as well as other data and digitalization trends.

We are focused on creating superior customer value through our comprehensive, modular offering, combining traditional products and services with software-enabled products and systems as well as digital services and software that we sell both separately and combined as scalable solutions. Our advanced software is a key differentiation of our digital offering and about 55 percent of our approximately 7,500 employees in research and development are active in software development.

The majority of our businesses are market leaders within their respective segments. We believe market leadership is critical, as it provides the opportunity for price leadership, which in turn supports profitability, enabling us to invest further in research and development to sustain our technological leadership. For a discussion of the geographic distribution of our total revenues, see "Item 5. Operating and Financial Review and Prospects—Analysis of results of operations—Revenues."

Industry market

Approximately half of our revenues are derived from customers within the industrial segment where we serve production facilities and factories all around the world, from process industries such as oil and gas, pulp and paper as well as mining, to discrete industries including automotive, food and beverage and consumer electronics. Demand for our electrification and automation offerings with embedded digital solutions increased as the energy crisis and tight labor markets served as a prominent reminder to companies of the importance of energy efficiency and flexibility in automated production. This has accelerated customer demand for the digital services and solutions we offer.

In discrete industries, we saw a normalization of customers' order patterns following a period of pre-buying due to extended delivery lead times as a result of the supply chain constraints in 2022. Demand in the automotive segment remained at a high level due to broadly accelerating investments in the EV segment, while the general industry and consumer-related robotics segments declined.

Late-cycle process industries were strong across nearly all customer segments. We saw particular strength in oil & gas-related demand. Strength was also noted in refining, petrochemicals and the energy-related low-carbon segments.

Transport & infrastructure market

Approximately one-third of our customers operate in the transport & infrastructure market. Our expertise provides efficient, reliable and sustainable solutions for these customers, with a focus on energy efficiency and reduced operating costs.

In transport & infrastructure, there was very strong order development across data centers. The buildings segment saw weakness in all three regions in residential-related demand. Demand in the commercial construction segments varied by geography, where the U.S. and Europe remained stable through most of the year but weakness was noted in China towards the latter part of the year. In the marine segment there were positive developments for the cruise ship sector as well as strong demand in general marine and ports.

Utilities market

We deliver solutions mainly for distribution utilities and renewables customers, while continuing to service conventional power generation customers with our control and automation solutions.

During 2023, the renewables markets continued to see strong growth. Business levels in the conventional power generation market remained stable. Demand from electrical distribution utilities remained strong, with ongoing investments to increase grid reliability and resilience due to increased integration of renewables.

We serve our customers through our operating divisions which are included in our Business areas. Developments in these Business areas are discussed in more detail below. Revenue figures presented in this Businesses section are before intersegment eliminations.

Electrification Business area

Overview

Electrification provides leading electrical distribution and management technologies, solutions and services to electrify the world in a safe, smart and sustainable way. The portfolio includes medium- and low-voltage electrical components, switchgear, digital devices, enclosures, and circuit breakers, among others. With our products, solutions and services, we collaborate with customers to improve power delivery and security, enhance energy management, efficiency and operational reliability, as we seek to achieve a low carbon society.

The Electrification Business area delivers products to end customers through a global network of channel partners and end customers. More than half of the Business area's revenue is derived from distributors and approximately a quarter is derived from direct sales to end-users. The remaining revenues are generated from original equipment manufacturers (OEMs), engineering, procurement and construction (EPC) contracting companies, system integrators, utilities and panel builders. The proportion of direct compared to channel partner sales varies by segment, product technology and geographic markets.

The Electrification Business area had approximately 50,300 employees as of December 31, 2023, and generated $14.6 billion of revenues in 2023.

Customers

The Electrification Business area serves a wide range of customer segments, including residential, commercial and industrial buildings, utilities, oil and gas, chemicals, data centers, renewables, food and beverage, transport and infrastructure, among others. From some of the world's tallest buildings to the busiest airports, the Business area's products and solutions cover a wide range of applications and business segments.

Products and Services

As of December 31, 2023, the Electrification Business area's products and services are delivered through five operating divisions. The Business area divested its Power Conversion Division in July 2023, which designed, developed, and manufactured end-to-end power conversion solutions for mission-critical applications in the telecommunications, data center, and industrial sectors.

The Distribution Solutions Division facilitates the efficient and reliable distribution, protection and control of power by improving electric power quality while strengthening the resilience of the grid. The Division offers segment-specific products and solutions that largely serve utilities, industry and infrastructure segments, often providing the requisite medium-voltage link between high-voltage transmission systems and low-voltage users. With ABB Ability™ enabled connected solutions at its core, the offering includes medium-voltage air- and gas-insulated switchgear (1 to 66 kilovolts), indoor and outdoor circuit breakers, reclosers, fuses, contactors, relays, instrument transformers, sensors, motor control centers, as well as low-voltage switchgear for the ANSI standard markets.

The Smart Power Division provides energy distribution solutions for data centers, industrial and manufacturing plants, critical infrastructure and commercial buildings. The Division's technical teams work closely with industry partners, delivering advanced solutions that support rapid growth, energy transition, and sustainability objectives. The Division's portfolio includes industrial circuit breakers, low-voltage systems, motor starting applications, and safety devices like switches and relays. Its Power Protection unit supports the world's largest data center companies with advanced energy-efficient UPS solutions. The Division's ABB Ability™ Energy Manager provides a scalable, easy-to-use platform that helps organizations save energy and reduce CO_2 emissions.

The Smart Buildings Division enables optimization of energy efficiency, safety, security and comfort for any building type, through new installations or retrofit solutions. The Division offers integrated digital technologies to control HVAC, lighting, shutters, and security, in addition to energy distribution solutions including DIN rail products, enclosures and emergency lighting through to industrial plugs and sockets and conventional wiring accessories, accommodating for single family homes, multiple dwellings, commercial buildings, infrastructure and industrial applications. The Division's highly innovative technologies and digital solutions serve rising global demand among real estate developers, owners, and investors for smart building technologies that optimize energy distribution and building automation. The scalable solutions aim to deliver significant sustainable and financial benefits, meeting social and environmental demands, while being able to address even the most complex of customers' carbon reduction strategies.

The Installation Products Division helps manage the connection, protection and distribution of electrical power from source to socket. The Division's products are engineered to provide ease of installation and perform in demanding and harsh conditions, helping to ensure safety and continuous operation for utilities, businesses and people around the world. The Commercial Essentials product segment includes electrical junction boxes, commercial fittings, strut and cable tray metal framing systems for commercial and residential construction. The Premier Industrial product segment includes multiple product lines, such as Ty-Rap® cable ties, T&B Liquidtight Systems® protection products, PVC coated and nylon conduit systems, power connection and grounding systems, and cable protection systems of conduits and fittings for harsh and industrial applications. The Division also manufactures solutions for medium-voltage applications used in the utility market under its marquee brands including Elastimold™ reclosers and switchgear, capacitor switches, current limiting fuses, Homac™ distribution connectors, Hi-Tech Valiant™ full-range current limiting fuse for fire mitigation, faulted current indicators and distribution connectors, cable accessories and apparatus with products for overhead and underground distribution. Manufacturing includes made-to-stock and custom-made solutions.

The Service Division partners with our customers to improve the availability, reliability, predictability and sustainability of electrical products and installations. The Division's extensive service portfolio offers product care, modernization, and advisory services to improve performance, extend equipment lifetime and deliver new levels of operational and sustainable efficiency. We help customers keep resources in use for as long as possible, extracting the maximum value from them, and then recovering and regenerating products and materials at the end of their useful life.

Sales and Marketing

Sales and marketing is generally conducted within the divisions in the Electrification Business area. This enables the divisions to manage their respective end-to-end activities and create demand across all channels, products and solutions. They increase focus and speed for our customers to drive faster growth. Where necessary, the divisions work together on joint services, such as the management of accounts, channels, and segment-sales, engaging in a range of promotional activities, both internal and external.

Competition

The Electrification Business area's principal competitors vary by product group and include Atkore, Chint, Eaton, Hager, Hubbell, Legrand, LS Electric, Mitsubishi Electric, nVent, Panasonic, Schneider Electric, Siemens and Vertiv.

Capital Expenditures

The Electrification Business area's capital expenditures for property, plant and equipment totaled $386 million in 2023, compared to $343 million in 2022. Investments in 2023 principally related to real estate investments, capacity expansion, as well as equipment replacement and upgrades. Geographically, in 2023, Europe represented 53 percent of the capital expenditures, followed by the Americas (35 percent) and Asia, Middle East and Africa (12 percent).

Motion Business area

Overview

The Motion Business area provides pioneering technology, products, solutions and related services to industrial customers to increase energy efficiency, improve safety and reliability, and maintain precise control over processes. The portfolio includes motors, generators and drives for a wide range of applications in all industrial sectors.

The Motion Business area designs, manufactures and sells drives, motors, generators, and traction converters. Building on long-standing experience in electric powertrains, the Business area combines domain expertise and technology to deliver the optimum solution for a wide range of applications for a comprehensive range of industrial segments. In addition, the Business area, along with its channel partners, has an industry leading global service presence.

The Motion Business area had approximately 22,300 employees as of December 31, 2023, and generated $7.8 billion of revenues in 2023.

Customers

The Motion Business area serves a wide range of customers in different industrial segments such as pulp and paper, oil and gas, metals and mining, food and beverage, HVAC, water and wastewater, transportation, power generation, marine and offshore.

Products and Services

The Motion Business area's products and services are delivered through seven operating divisions.

The Drive Products Division serves the industries and infrastructure segments with world-class drives and programmable logic controllers (PLC). With its products, global scale and local presence, the Division helps customers to improve energy efficiency, productivity and safety.

The System Drives Division is the market leader in high-power, high-performance drives, drive systems and packages for industrial process and large infrastructure applications, and a leading supplier of power conversion equipment for renewable energy and other applications. The Division offers global support to help customers, partners and equipment manufacturers with asset reliability, performance improvement and energy efficiency in mission critical applications.

The Service Division serves customers worldwide by maximizing uptime, extending product life cycle and enhancing the performance and energy efficiency of their electrical motion solutions. The Division is leading the way in digitalization by securely connecting motors and drives, increasing operational uptime and improving efficiency. The services offered make the difference for our customers and partners every day by helping keep their operations running profitably, safely and reliably.

The Traction Division is a recognized leader in onboard propulsion technologies that drive innovation in rail, bus, and industrial vehicle electrification. A comprehensive range of high-performance and full lifecycle managed propulsion, auxiliary and energy storage solutions help improve energy efficiency and contribute to making transportation more sustainable.

The IEC Low Voltage Division is a technology leader delivering a full range of energy-efficient low voltage motors, including ultra-efficient solutions such as IE5 SynRM (synchronous reluctance motors). Through a global footprint, domain expertise and rugged designs, the Division provides reliable technology that improves efficiency and productivity even in the most demanding applications.

The Large Motors and Generators Division offers a comprehensive product portfolio of large AC motors and generators. The Division's induction, synchronous and special design motors and synchronous generators power critical applications across industry, infrastructure and marine

transportation. Combining the best available materials with superior technology, the large motors and generators are designed to operate efficiently and reliably, even for challenging processes or applications and to have low life cycle costs.

The NEMA Motors Division is a marketer, designer and manufacturer that offers Baldor-Reliance® industrial electric motors, primarily in North America. The Division focuses on quality, reliability and efficiency to provide a comprehensive offering of NEMA motors in the market across most industrial segments and applications.

Sales and Marketing

Sales are made both through direct sales forces and through channel partners, such as distributors and wholesalers, as well as installers, OEMs and system integrators. The proportion of direct sales to end users compared to channel partner sales varies among the different industries, products and geographic markets.

Competition

The principal competitors of the Motion Business area include Schneider Electric, Siemens, Toshiba, WEG Industries, Wolong and Danfoss.

Capital Expenditures

Capital expenditures in the Motion Business area for property, plant and equipment totaled $171 million in 2023, compared to $150 million in 2022. Principal expenditures in 2023 related to real estate investments, capacity expansion, equipment replacement and upgrades across various countries including Finland, Switzerland, the United States, China and India. Geographically, in 2023, Europe represented 54 percent of the capital expenditures, followed by the Americas (33 percent) and Asia, Middle East and Africa (13 percent).

Process Automation Business area

Overview

The Process Automation Business area provides a comprehensive range of integrated automation, electrical and digital systems and services for customers in the process, hybrid and maritime industries. These offerings, coupled with deep domain knowledge in each end market, help to optimize productivity, energy efficiency, sustainability and safety of industrial processes and operations.

The Business area's offering can be grouped into two categories, with approximately half of the offering related to solutions for new and brownfield projects and half related to service, mainly for the existing installed base. Process Automation also integrates offerings from the Electrification, Motion and Robotics & Discrete Automation Business areas into its projects. The Business area's offerings are sold primarily through its direct sales force with a smaller share through partners and distributors.

The Business area had approximately 21,100 employees as of December 31, 2023, and generated revenues of $6.3 billion in 2023.

Customers

The Process Automation Business area's end customers include companies across process, hybrid and maritime industries. These industries include oil, gas, chemicals, mining, metals, cement, pulp and paper, pharmaceuticals, battery manufacturing, food and beverage, power generation, water, marine and ports.

Products and Services

The Process Automation Business area offering includes an extensive portfolio of products, solutions, digital applications and services for the control of the simplest to the most complex and critical industrial processes and infrastructure. These systems can link various process and information flows, allowing customers to manage and control their entire production process based on real-time information. The Business area's automation offering includes the distributed control system (DCS) ABB Ability™ System 800xA®, which is also an electrical control system, a safety system and a collaboration enabler with the capacity to improve engineering efficiency, operator performance and asset utilization. Other control solutions include Symphony® Plus (designed to address automation needs of the power and water industry segments) and the Freelance DCS solution. Components for basic automation solutions, process controllers, I/O modules, panels, and Human Machine Interfaces (HMI) are available through the Compact Product Suite offering. The product portfolio is complemented by a suite of ABB Ability™ Advanced Digital Services and by ABB Care, a subscription-based lifecycle management program that provides services to maintain and continually advance and enhance ABB's distributed control systems and optimize customers' lifecycle costs. The ABB Ability™ Genix Industrial Analytics and Artificial Intelligence Suite unlocks greater value by contextualizing and integrating data from IT, engineering, and operations systems to provide deep, meaningful and actionable insights. The portfolio is complemented by a range of industry-specific applications in each division.

As of December 31, 2023, the Process Automation Business area's products and services are delivered through four operating divisions.

The Energy Industries Division serves a wide range of industrial sectors, including hydrocarbons, chemicals, pharmaceuticals, power generation and water. With its integrated solutions that automate, digitalize and electrify operations, the Division is committed to supporting traditional industries in their efforts to decarbonize. The Division also supports the development, integration and scaling up of new and renewable energy models. The Division's goal is to help customers adapt and succeed in the rapidly changing global energy transition. Harnessing data, machine learning and artificial intelligence (AI), the Division brings over 50 years of domain expertise delivering solutions designed to improve energy, process and production efficiency, as well as reduce risk, operational cost and capital cost, while minimizing waste for customers, from project start-up and throughout the entire plant lifecycle.

The Process Industries Division serves the mining, minerals processing, metals, cement, pulp and paper, battery manufacturing, and food and beverage, as well as their associated service industries. The Division brings deep industry domain expertise coupled with the ability to integrate both automation and electrical systems, increase productivity and reduce overall capital and operating costs for customers. For mining, metals and cement customers, solutions include specialized products and services, as well as total production systems. The Division designs, plans, engineers, supplies, installs and commissions integrated electrical and motion systems, including electric equipment, drives, motors, high power rectifiers and equipment for automation and supervisory control within a variety of areas including mineral handling, mining operations, aluminum smelting, hot and cold steel applications and cement production. The offering for the pulp and paper industries includes control systems, quality control systems, drive systems, on-line sensors, actuators and field instruments. Digitalization solutions, including collaborative operations and augmented reality, help improve plant and enterprise productivity, and reduce maintenance and energy costs.

The Marine & Ports Division serves the shipping and ports industries through its extensive portfolio of integrated systems and solutions that improve the flexibility, reliability and energy efficiency of vessels and container terminals. By coupling power, propulsion, automation, marine software and services that ensure maximum vessel uptime, the Division is well positioned to help the marine industry to achieve its decarbonization targets while improving the profitability and sustainability of our customers' business throughout the entire lifecycle of vessels. With ABB Ability™ Marine software solutions and ABB Ability™ Collaborative Operations Centers around the world, shipowners and operators can run their fleets at lower fuel and maintenance costs, while improving crew, passenger and cargo safety as well as overall productivity of their operations. Further, the Division delivers automation, electrical systems and digital solutions for container and bulk cargo handling, from ship to gate. These solutions help terminal operators meet the challenge of larger ships, taller cranes and bigger volumes per call, and make terminal operations safer, greener and more productive.

The Measurement & Analytics Division is among the world's leading manufacturers and suppliers of smart instrumentation and analyzers, working at the heart of industrial digital transformation. The Measurement & Analytics Division's portfolio consists of analyzers measuring compositions of gases and liquids; instrumentation measuring process variables such as temperature, pressure, flow, and level; force measurement solutions measuring parameters such as flatness, thickness, and tension; and advanced digital solutions for device management, device health check and predictive maintenance. The Measurement & Analytics Division serves key industries such as oil and gas, chemical, water and wastewater, power, hydrogen, batteries, as well as the marine industry. The Division enables the optimization of industrial processes by providing and analyzing data collected from sensing and smart measurement devices. Parameters such as emission levels and production inputs are measured by providing 'before' and 'after' values, enabling efficient operations and environmental sustainability through measurement.

Sales and Marketing

The Process Automation Business area's sales are primarily made through its direct sales force as well as third-party channel partners, such as distributors, system integrators and OEMs. The majority of revenues are derived through the Business area's own direct sales channels.

Competition

The Process Automation Business area's principal competitors vary by industry or product group. Competitors include: Emerson, Honeywell, Schneider Electric, Siemens, Siemens Energy, Yokogawa, Endress + Hauser, Kongsberg and Valmet.

Capital Expenditures

The Process Automation Business area's capital expenditures for property, plant and equipment totaled $66 million in 2023, compared to $100 million in 2022. Principal investments in 2023 primarily related to equipment replacement and upgrades, mainly in the Energy Industries Division and Measurement & Analytics Division. Geographically, in 2023, Europe represented 68 percent of the capital expenditures, followed by the Americas (19 percent) and Asia, Middle East and Africa (13 percent).

Robotics & Discrete Automation Business area

Overview

The Robotics & Discrete Automation Business area provides robotics, and machine and factory automation including products, software, solutions and services. Revenues are generated both from direct sales to end users as well as from indirect sales mainly through system integrators and machine builders.

The Robotics & Discrete Automation Business area had approximately 11,300 employees as of December 31, 2023, and generated $3.6 billion of revenues in 2023.

Customers

The Robotics & Discrete Automation Business area serves a wide range of customers. The main customers are active in industries such as automotive, machine building, metalworking, electronics, food and beverage and logistics. They include end-users such as manufacturers, system integrators and machine builders.

Products and Services

The Robotics & Discrete Automation Business area's products and services are delivered through two operating divisions.

The Robotics Division offers a wide range of products, solutions and services including robots, autonomous mobile robots, robotics application cells and smart systems, field services, spare parts, digital services, engineering and operations software. This offering provides customers with increased productivity, quality, flexibility and simplicity for operations, e.g. to meet the challenge of making smaller lots of a larger number of specific products in shorter cycles for today's dynamic global markets and coping with increasing uncertainty. Robots are also used in activities or environments which may be hazardous to employee health and safety, such as repetitive or strenuous lifting, dusty, hot or cold rooms, or painting booths and can help customers address labor shortages. Robotics solutions are used in a wide range of segments from automotive OEMs, automotive suppliers, electronics, general industry, consumer goods, food and beverage, and warehouse/logistics center automation. They are increasingly deployed in service applications for life sciences care, restaurants and retail. Typical robotic applications include welding, material handling, machine tending, machining, painting, picking, packing, palletizing and assembly.

The Machine Automation Division offers integrated automation solutions based on programmable logical controllers, industrial PCs, servo motion, industrial transport systems and machine vision. It also provides software for engineering and optimization. The range of solutions are mainly used by machine builders for various types of series machines, e.g. for plastics, metals, printing and packaging.

Sales and Marketing

Sales are made both through direct sales as well as through third-party channel partners, such as system integrators and machine builders. The proportion of direct sales compared to channel partner sales varies among the different industries, product technologies and geographic markets.

Competition

Competitors of the Robotics & Discrete Automation Business area vary by offering and include companies such as Fanuc, Kuka, Yaskawa, Epson, Dürr, Stäubli, Universal Robots, Rockwell Automation, Siemens, Mitsubishi Electric and Beckhoff.

Capital Expenditures

The Robotics & Discrete Automation Business area's capital expenditures for property, plant and equipment totaled $71 million in 2023, compared to $86 million in 2022. Principal investments in 2023 were primarily related to the expansion of the North American robotics headquarters and manufacturing facility in the United States and production enhancements in both the Robotics Division in China and the Machine Automation Division in Austria. In 2023, Europe represented 55 percent of capital expenditures, followed by the Americas (24 percent) and Asia, Middle East and Africa (21 percent).

Corporate and Other

Corporate and Other includes core headquarter functions, real estate activities, Corporate Treasury, functional shared services for human resources, finance and information services and other minor business activities. Certain strategic investments managed by ABB Technology Ventures are also included in Corporate. The remaining activities of certain EPC projects which we are completing and are in a wind-down phase are reported as non-core businesses within Corporate and Other. The historical business activities of certain divested businesses are also presented in Corporate and Other. These include the high-voltage cables business, steel structures and certain EPC contracts relating to the oil and gas industry. In addition, effective January 1, 2023, the E-mobility Division became a separate operating segment and is reported in Corporate and Other for all periods presented.

Corporate headquarters and stewardship activities include the operations of our corporate headquarters in Zurich, Switzerland, as well as limited corporate-related activities in certain countries. These activities cover staff functions with group-wide responsibilities, such as accounting and financial reporting, corporate finance and corporate treasury, taxes, internal audit, legal and integrity, compliance, risk management and insurance, corporate communications, human resources, information systems and investor relations.

We operate shared service centers globally through a network of hubs which consist of services in the areas of human resources, finance and information services. We also staff and maintain front offices in various countries. The costs of these shared services are incurred primarily for the benefit of the Business areas, which are charged for their use of such services and the related number of employees are allocated to the Business areas. Similarly, a significant portion of the shared corporate overhead costs are charged to the operating businesses. We also provide services to third parties under transitional service agreements in relation to certain divested businesses, the largest of which is Hitachi Energy (the former Power Grids business).

The E-mobility Division is contributing to a zero-emission mobility future with smart, reliable and emission-free electric vehicle charging solutions including market leading charging hardware, ABB Ability™ enabled digital services and energy and fleet management solutions. ABB E-mobility offers a leading portfolio of EV charging solutions from smart chargers for the home to high-power chargers for the highway stations of the future, solutions for the electrification of fleets and opportunity charging for electric buses and trucks.

Corporate and Other had approximately 2,900 employees at December 31, 2023, of which approximately 2,100 pertain to the E-mobility Division and our other non-core businesses.

Discontinued operations

In 2020, we completed the divestment of our Power Grids business to Hitachi Ltd (Hitachi). As a result, the Power Grids business was reported as discontinued operations in the Consolidated Financial Statements. See “Note 3 - Discontinued operations” to our Consolidated Financial Statements.

Capital expenditures

Total capital expenditures for property, plant and equipment and intangible assets (excluding intangibles acquired through business combinations) amounted to $770 million, $762 million and $820 million in 2023, 2022 and 2021, respectively. In 2023 and 2022, capital expenditures were 1 percent and 6 percent lower, respectively, than depreciation and amortization. Excluding acquisition-related amortization, capital expenditures were 37 percent higher in 2023 and 30 percent higher in 2022, respectively, than depreciation and amortization.

Capital expenditures in 2023 primarily focused in mature markets, reflecting the geographic distribution of our existing production facilities. Capital expenditures in Europe and the Americas in 2023 were driven primarily by upgrades of existing production facilities and capacity expansion, mainly in the U.S., Germany, Italy, Finland, Switzerland and Austria. In Asia, Middle East and Africa, capital expenditures were made primarily to increase production capacity by investing in new or expanded facilities, the highest of which were in China and India. The share of emerging markets capital expenditures as a percentage of total capital expenditures in 2023 and 2022 was 23 percent and 24 percent, respectively.

At December 31, 2023, construction in progress for property, plant and equipment was $713 million, mainly in the U.S., Germany, Switzerland and Finland, while at December 31, 2022, construction in progress for property, plant and equipment was $586 million, mainly in the U.S., Germany, Switzerland, Finland, Austria, China and Sweden.

Our capital expenditures relate primarily to property, plant and equipment and are funded primarily through cash flows from operating activities. For 2024, we estimate the expenditures for property, plant and equipment will be higher than our annual depreciation and amortization charge, excluding acquisition-related amortization.

Supplies and raw materials

We purchase a variety of supplies and products which contain raw materials for use in our production and project execution processes. The primary materials used in our products, by weight, are copper, steel, aluminum, mineral oil and various plastics. We also purchase a wide variety of fabricated products, electronic components and systems. We operate a worldwide supply chain management network with employees dedicated to this function in our Business areas, divisions and in key countries. Our supply chain operations consists of a number of teams, each focusing on different product categories. These category teams are tasked with taking advantage of opportunities to leverage the scale of ABB on a global, Business area and/or division level, as appropriate, to optimize the efficiency of our supply networks in a sustainable manner.

Our supply chain management organization's activities and objectives include:

- pool and leverage procurement of materials and services,
- provide transparency of ABB's global spending through a comprehensive performance and reporting system linked to our enterprise resource planning (ERP) systems,
- strengthen ABB's supply chain network by implementing an effective product category management structure and extensive competency-based training, and
- monitor and develop our supply base to ensure sustainability, both in terms of materials and processes used.

We buy many categories of products which contain copper, steel, aluminum, crude oil and other commodities. Continuing global economic growth in many emerging economies, coupled with the volatility in foreign currency exchange rates, has led to significant fluctuations in these raw material costs over the last few years. While we expect global commodity prices to remain highly volatile, we expect to offset some market volatility through the use of long-term contracts and global sourcing.

We seek to mitigate the majority of our exposure to commodity price risk by entering into derivative contracts. For example, we manage copper, steel, aluminum, and silver price risk using principally swap contracts based on prices for these commodities quoted on leading exchanges. ABB's hedging policy is designed to safeguard margins by minimizing price volatility and providing a stable cost base during order execution. In addition to using derivatives to reduce our exposure to fluctuations in raw materials prices, in some cases we can reduce this risk by incorporating changes in raw materials prices into the prices of our end products (through price escalation clauses).

Throughout 2023, we continued to optimize our value chain in all aspects of our business, while ensuring high standards of quality and delivery. Despite some continuing global supply chain challenges such as rising costs, port congestion, material access issues and some geopolitical uncertainty, we were able to mitigate these difficulties with efforts from our dedicated category teams, supply chain management personnel and Business area task forces. We also enhanced our rigorous supplier onboarding process involving comprehensive integrity due diligence and competitive bidding for our potential and existing vendors. This helps in reducing the risk of fraud, corruption and non-compliance as well as in securing the best value and quality for our products and services. As a result, we were able to minimize the impact of supply chain disruptions, maintain a high level of customer satisfaction and support our business growth.

Through our Sustainable Supply Base Management (SSBM) approach, we assess environment, social and governance (ESG) risks, compliance, and the performance of our suppliers in these areas to make sure they meet our expectations. These expectations are detailed in the ABB Supplier Code of Conduct and the ABB Code of Conduct. In 2023, the Supplier Code of Conduct was revised and updated to reflect the increasing legal and stakeholder requirements as well as our Sustainability Framework 2030.

In August 2012, the SEC issued its final rules regarding "Conflict Minerals", as required by section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act. We initiated conflict mineral processes in 2013 and have continuously aimed at improving and tailoring the processes to our value chain. We continue to work with our suppliers and customers, to enable us to comply with the rules and disclosure obligations. Further information on ABB's Conflict Minerals policy and supplier requirements can be found under "Responsible Minerals Sourcing" at https://global.abb/group/en/about/supplying/responsible-minerals.

Furthermore, ABB has developed a list of prohibited and restricted substances to ensure that the materials we use do not contribute to environmental degradation. We update this list regularly in line with international regulations, including the U.S. Toxic Substances Control Act (TSCA) regulations and California Proposition 65. More information on our Product Material Compliance program and supplier requirements can be found under "Material Compliance" at https://global.abb/group/en/about/supplying/material-compliance.

As announced in 2022, ABB is working closely with its most impactful suppliers to reduce GHG emissions along the supply chain. In 2023, we partnered with EcoVadis, a leading service provider in the ESG domain, to engage with suppliers for GHG emission data collection and supplier education on this topic.

Patents and trademarks

While we are not materially dependent on any one of our intellectual properties, as a technology-driven company, we believe that intellectual property rights are crucial to protect the assets of our business. We continue to file new patent applications to protect our new inventions. As of December 31, 2023, we have a portfolio of approximately 26,000 pending patent applications and granted patents, of which approximately 5,700 are pending applications. This portfolio includes approximately 3,600 utility models and design rights, of which approximately 170 are pending applications. In 2023, we filed over 650 priority patents, utility model and design applications, each covering a unique invention or unique angle on an invention. Additionally, we filed approximately 1,900 secondary patents, utility model and design applications, each extending the coverage of a previously filed priority application.

Based on our existing intellectual property strategy, we believe that we have adequate control over our core technologies. The "ABB" trademarks and logo are protected in all of the countries in which we operate. We proactively assert our intellectual property rights to safeguard the reputation associated with the ABB technology and brand. While these intellectual property rights are fundamental to all of our businesses, there is no dependency of the business on any single patent, utility model or design application.

Management overview

In 2023 we delivered a strong operational result as we executed on our strong order backlog which was built up during a period of a strained value chain, inflation and an energy crisis. It was also another year of robust price execution where the linked benefits more than offset the inflation in labor costs while the margin was further supported by lower inflation-affected input costs and freight. In the wake of normalizing value chains, price management progressively returned to be customer value driven. The energy crisis triggered a series of customer investments throughout the year and further highlighted their need to ramp up investments in energy efficiency and transition to renewable energy sources. During the year we saw high customer activity in the areas of LNG and hydrogen, highlighting how relevant our offering and technologies are to address these energy challenges.

The ABB Way operating model facilitates more efficient ways of working which, combined with a strong market situation, led to increased operational results. We delivered record segment profit (Operational EBITA) and continued to see our divisions progress through their strategic mandates of stability and profitability before growth. With approximately 70 percent of division revenues now covered under a growth mandate we are increasingly shifting our focus to growth.

We continued to be active in portfolio management and completed the sale of our Power Conversion Division in July 2023, marking the completion of the three announced divisional exits.

Active portfolio management continues to be part of our performance culture and is an integrated part of the responsibilities of divisional management teams. This includes identifying areas for inorganic growth through acquisitions related to new segments, new market access, better economies of scale or filling technology gaps. The divisions also assess, based on systematic portfolio reviews, whether, ultimately, their division is the best owner of their different businesses. During 2023, we also continued to make strategic venture capital investments focused in the areas of digital capabilities and software, completing nine new investments during the year and a number of follow-on investments in existing ventures. The divisions continue to build up their acquisition target pipelines and, during 2023, we completed the acquisitions of the Siemens low-voltage motor business led by the NEMA Motors Division, strengthened our smart home technology portfolio with the acquisition of EVE systems led by the Smart Buildings Division, and completed four other smaller bolt-on acquisitions primarily related to software and AI technology. As part of our future strategy, we continue to aim to complete five to ten small to mid-size bolt-on acquisitions each year. On the divestment side, the Energy Industries Division completed the divestment of its technical engineering consultancy business in the United Kingdom and the Smart Buildings Division divested their industrial plugs & sockets product line.

Business progress

During 2023, underlying demand for ABB's offering remained resilient from the previous year's already high level with reported orders being steady, somewhat negatively impacted by exchange rates and business divestments. Throughout the year we noted that order momentum was strongest in the systems- and project-related businesses, driven predominantly by utilities and datacenters as well as process-related industries. This offset some softening of demand in the short-cycle business from the previous year's high order level, mainly in the residential construction segment and in the discrete manufacturing sectors apart from the automotive segment, as customers normalized order patterns in the face of shortening delivery lead times. In total, orders continued to exceed revenues in three out of four Business areas, and we further increased total order backlog.

While our orders decreased 1 percent (increased 1 percent in local currencies) in 2023, revenue growth was stronger, reaching 9 percent (11 percent in local currencies). As supply chain constraints and imbalances in the overall supply chain eased we were able to effectively convert orders into deliveries.

Group profitability showed strong improvement during 2023 with the level of segment profit improving in all Business areas. The result was driven by strong pricing execution, increased volumes and improved internal efficiency. Active price management and productivity gains were able to offset increasing labor inflation as well as some limited cost inflation related to commodities which were still present in the first half of the year.

The profitability improvement as well as our ability to keep working capital steady facilitated by the normalization of supply chains allowed us to achieve strong operating cashflows. Cash flows from operating activities in continuing operations improved to $4.3 billion in 2023, an increase of $3 billion compared to 2022. This improvement was further helped as the previous year's results included significant cash outflows relating to the exit of a non-core business, the payment for the settlement related to regulatory penalties for the Kusile project, costs for the spinoff of the Turbocharging Division as well as ongoing restructuring and business transformation costs.

We continued to make organic growth investments in a disciplined manner, prioritizing research and development while reducing administrative costs. Total non-order related research and development was $1.3 billion in 2023, or 4.1 percent of revenues.

Updated financial targets

During 2023, we raised our growth target to 5 to 7 percent (up from 3 to 5 percent) for comparable average revenue growth, through an economic cycle, in constant currencies and excluding acquisitions and divestments. In addition we continue to target 1 to 2 percent acquired revenue growth through the economic cycle net of acquisitions and divestments.

For the Operational EBITA margin, having reached our target of at least 15 percent a year earlier than planned, we raised our target to be in the range of 16 to 19 percent on an annual basis commencing in 2024.

As a result of our higher growth and Operational EBITA margin targets and increasing focus on capital returns, including in the annual employee incentive plans, we have increased our Return on Capital Employed (ROCE) target to be above 18 percent excluding transformative deals defined as being larger than 3 percent of Group revenues annually (up from the range of 15 to 20 percent).

Additionally, we have sharpened our EPS growth target to be at least high-single digit through the economic cycle (from basic EPS growth above revenue growth) reflecting our confidence in our ability to sustainably reduce the gap between Operational EBITA and Income from operations.

Lastly, we maintain our target to achieve Free cash flow conversion of approximately 100 percent on an annual basis.

Capital allocation

Our capital allocation priorities are unchanged:

- funding organic growth, research and development, and capital expenditures at attractive returns,
- paying a rising, sustainable dividend per share over time,
- investing in value-creating acquisitions, and
- returning additional cash to shareholders.

We expect that our strong cash generation, on the back of the ABB Way operating model, will enhance our flexibility to invest in both organic growth and bolt-on acquisitions, while providing attractive returns to shareholders.

At the 2024 Annual General Meeting (AGM), the Board of Directors is proposing a dividend of 0.87 Swiss francs per share. Under the various share buyback programs we repurchased $893 million of shares in 2023.

Sustainability Agenda

With our sustainability agenda, we are actively contributing to a more sustainable world, leading by example in our own operations and partnering with customers and suppliers to enable a low-carbon society, preserve resources and promote social progress. All three pillars of our sustainability agenda are underpinned by our commitment to create a culture of integrity and transparency across our value chain.

Amongst other focus areas in 2023, we've reinforced and accelerated our sustainability efforts, aligning our methodologies with recognized international frameworks. We have submitted updated SBTi (Science Based Targets initiative) targets to be net-zero aligned. In this context, we increased our scope 3 emissions reduction target to 25 percent by 2030. By 2050, we target to have a 100 percent reduction in Scope 1 and 2 emissions versus the 2019 baseline and a 90 percent reduction in Scope 3 emissions versus the 2022 baseline. Furthermore, we aligned our methodology for our avoided emissions to the World Business Council for Sustainable Development (WBCSD) 2023 guidance and moved from a target to an ambition to avoid 600 megatons of CO_2e emissions by 2030, providing increased credibility and comparability to our contribution of enabling a low carbon society. For a detailed discussion of our sustainability strategy 2030 and our progress in 2023, see "Item 4. Information on the Company—Sustainability activities".

Critical accounting policies and estimates

General

We prepare our Consolidated Financial Statements in accordance with U.S. GAAP and present these in U.S. dollars unless otherwise stated.

The preparation of our financial statements requires us to make assumptions and estimates that affect the reported amounts of assets, liabilities, revenues and expenses and the related disclosure of contingent assets and liabilities. We evaluate our estimates on an ongoing basis (see "Note 2 - Significant accounting policies" to our Consolidated Financial Statements for a listing of our most significant accounting estimates). Where appropriate, we base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from our estimates and assumptions.

We deem an accounting policy to be critical if it requires an accounting estimate to be made based on assumptions about matters that are highly uncertain at the time the estimate is made and if different estimates that reasonably could have been used, or if changes in the accounting estimates that are reasonably likely to occur periodically, could materially impact our Consolidated Financial Statements. We also deem an accounting policy to be critical when the application of such policy is essential to our ongoing operations. We believe the following critical accounting policies require us to make subjective judgments, often as a result of the need to make estimates regarding matters that are inherently uncertain and material to our Consolidated Financial Statements. These policies should be considered when reading our Consolidated Financial Statements.

Revenue recognition

A customer contract exists if collectability under the contract is considered probable, the contract has commercial substance, contains payment terms, the rights and commitments of both parties, and has been approved. By analyzing the type, terms and conditions of each contract or arrangement with a customer, we determine which revenue recognition method applies.

We recognize revenues when control of goods or services is transferred to customers in an amount that reflects the consideration we expect to be entitled to in exchange for these goods or services. Control is transferred when the customer has the ability to direct the use and obtain the benefits from the goods or services.

The percentage-of-completion method of accounting is generally used when recognizing revenue on an over time basis and involves the use of assumptions and projections, principally relating to future material, labor, subcontractor and project-related overhead costs as well as estimates of the amount of variable consideration to which we expect to be entitled. As a consequence, there is a risk that total contract costs or the amount of variable consideration will, respectively, either exceed or be lower than those we originally estimated (based on all information reasonably available to us) and the margin will decrease or the contract may become unprofitable. This risk increases if the duration of a contract increases because there is a higher probability that the circumstances upon which we originally developed our estimates will change, resulting in increased costs that we may not recover. Factors that could cause costs to increase include:

- unanticipated technical problems with equipment supplied or developed by us which may require us to incur additional costs to remedy,
- changes in the cost of components, materials or labor,
- difficulties in obtaining required governmental permits or approvals,
- project modifications creating unanticipated costs,
- suppliers' or subcontractors' failure to perform, and
- delays caused by unexpected conditions or events.

Changes in our initial assumptions, which we review on a regular basis between balance sheet dates, may result in revisions to estimated costs, current earnings and anticipated earnings. We recognize these changes in the period in which the changes in estimates are determined. By recognizing changes in estimates cumulatively, recorded revenue and costs to date reflect the current estimates of the stage of completion of each project. Additionally, losses on such contracts are recognized in the period when they are identified and are based upon the anticipated excess of contract costs over the related contract revenues.

Pension and other postretirement benefits

As more fully described in "Note 17 - Employee benefits" to our Consolidated Financial Statements, we have a number of defined benefit pension and other postretirement plans and recognize an asset for a plan's overfunded status or a liability for a plan's underfunded status in our Consolidated Balance Sheets. We measure such a plan's assets and obligations that determine its funded status as of the end of the year.

Significant differences between assumptions and actual experience, or significant changes in assumptions, may materially affect the pension obligations. The effects of actual results differing from assumptions and the changing of assumptions are included in net actuarial loss within Accumulated other comprehensive loss.

We recognize actuarial gains and losses gradually over time. Any cumulative unrecognized actuarial gain or loss that exceeds 10 percent of the greater of the present value of the projected benefit obligation (PBO) and the fair value of plan assets is recognized in earnings over the expected average remaining working lives of the employees participating in the plan, or the expected average remaining lifetime of the inactive plan participants if the plan is comprised of all or almost all inactive participants. Otherwise, the actuarial gain or loss is not recognized in the Consolidated Income Statements.

We use actuarial valuations to determine our pension costs and credits. The amounts calculated depend on a variety of key assumptions, including discount rates, mortality rates and expected return on plan assets. Under U.S. GAAP, we are required to consider current market conditions in making these assumptions. In particular, the discount rates are reviewed annually based on changes in long-term, highly-rated corporate bond yields. Decreases in the discount rates result in an increase in the PBO and a decrease in pension costs. Conversely, an increase in the discount rates results in a decrease in the PBO and an increase in pension costs. The mortality assumptions are reviewed annually by management. Decreases in mortality rates result in an increase in the PBO and in pension costs. Conversely, an increase in mortality rates results in a decrease in the PBO and in pension costs.

Holding all other assumptions constant, a 0.25 percentage-point decrease in the discount rate would have increased the PBO related to our defined benefit pension plans by $157 million while a 0.25 percentage-point increase in the discount rate would have decreased the PBO related to our defined benefit pension plans by $153 million.

The expected return on plan assets is reviewed regularly and considered for adjustment annually based upon the target asset allocations and represents the long-term return expected to be achieved. Decreases in the expected return on plan assets result in an increase to pension costs. Holding all other assumptions constant, an increase or decrease of 0.25 percentage points in the expected long-term rate of asset return would have decreased or increased, respectively, the net periodic benefit cost in 2023 by $16 million.

The funded status, which can increase or decrease based on the performance of the financial markets or changes in our assumptions, does not represent a mandatory short-term cash obligation. Instead, the funded status of a defined benefit pension plan is the difference between the PBO and the fair value of the plan assets. Our defined benefit pension plans were overfunded by $212 million and $326 million at December 31, 2023 and 2022, respectively.

Income taxes

In preparing our Consolidated Financial Statements, we are required to estimate income taxes in each of the jurisdictions in which we operate. Tax expense from continuing operations is reconciled from the weighted-average global tax rate (rather than from the Swiss domestic statutory tax rate). As the parent company of the ABB Group, ABB Ltd, is domiciled in Switzerland, income which has been generated in jurisdictions outside of Switzerland (hereafter “foreign jurisdictions”) and has already been subject to corporate income tax in those foreign jurisdictions is, to a large extent, tax exempt in Switzerland. Therefore, generally no or only limited Swiss income tax has to be provided for on the repatriated earnings of foreign subsidiaries. There is no requirement in Switzerland for a parent company of a group to file a tax return of the group determining domestic and foreign pre-tax income and as our consolidated income from continuing operations is predominantly earned outside of Switzerland, corporate income tax in foreign jurisdictions largely determines our global weighted-average tax rate.

We account for deferred taxes by using the asset and liability method. Under this method, we determine deferred tax assets and liabilities based on temporary differences between the financial reporting and the tax bases of assets and liabilities. Deferred tax assets and liabilities are measured using the enacted tax rates and laws that are expected to be in effect when the differences are expected to reverse. We recognize a deferred tax asset when it is more likely than not that the asset will be realized. We regularly review our deferred tax assets for recoverability and establish a valuation allowance based upon historical losses, projected future taxable income and the expected timing of the reversals of existing temporary differences. To the extent we increase or decrease this allowance in a period, we recognize the change in the allowance within Income tax expense in the Consolidated Income Statements unless the change relates to discontinued operations, in which case the change is recorded in Loss from discontinued operations, net of tax. Unforeseen changes in tax rates and tax laws, as well as differences in the projected taxable income as compared to the actual taxable income, may affect these estimates.

Certain countries levy withholding taxes, dividend distribution taxes or additional corporate income taxes (hereafter “withholding taxes”) on dividend distributions. Such taxes cannot always be fully reclaimed by the shareholder, although they have to be declared and withheld by the subsidiary. Switzerland has concluded double taxation treaties with many countries in which we operate. These treaties either eliminate or reduce such withholding taxes on dividend distributions. It is our policy to distribute retained earnings of subsidiaries, insofar as such earnings are not permanently reinvested or no other reasons exist that would prevent the subsidiary from distributing them. No deferred tax liability is set up if retained earnings are considered as indefinitely reinvested and used for financing current operations as well as business growth through working capital and capital expenditure in those countries.

We operate in numerous tax jurisdictions and, as a result, are regularly subject to audit by tax authorities, including for transfer pricing. We provide for tax contingencies whenever it is deemed more likely than not that a tax asset has been impaired or a tax liability has been incurred for events such as tax claims or changes in tax laws. Contingency provisions are recorded based on the technical merits of our filing position, considering the applicable tax laws and OECD guidelines and are based on our evaluations of the facts and circumstances as of the end of each reporting period. Changes in the facts and circumstances could result in a material change to the tax accruals. Although we believe that our tax estimates are reasonable and that appropriate tax reserves have been made, the final determination of tax audits and any related litigation could be different than that which is reflected in our income tax provisions and accruals.

An estimated loss from a tax contingency must be accrued as a charge to income if it is more likely than not that a tax asset has been impaired or a tax liability has been incurred and the amount of the loss can be reasonably estimated. We apply a two-step approach to recognize and measure uncertainty in income taxes. The first step is to evaluate the tax position for recognition by determining if the weight of available evidence indicates that it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount which is more than 50 percent likely of being realized upon ultimate settlement. The required amount of provisions for contingencies of any type may change in the future due to new developments.

Goodwill and intangible assets

We review goodwill for impairment annually as of October 1, or more frequently if events or circumstances indicate the carrying value may not be recoverable. We use either a qualitative or quantitative assessment method for each reporting unit.

As each of our divisions have full ownership and accountability for their respective strategies, performance and resources, we have determined our reporting units to be at the division level, which is generally one level below our reportable segments of Electrification, Motion, Process Automation and Robotics & Discrete Automation.

When performing the qualitative assessment, we first determine, for a reporting unit, factors which would affect the fair value of the reporting unit including: (i) macroeconomic conditions related to the business, (ii) industry and market trends, and (iii) the overall future financial performance and future opportunities in the markets in which the business operates. We then consider how these factors would impact the most recent quantitative analysis of the reporting unit's fair value. Key assumptions in determining the fair value of the reporting unit include the projected level of business operations including future expected profit margins, the reporting unit's weighted-average cost of capital and the terminal growth rate.

During 2023, we divested our Power Conversion Division resulting in nineteen divisions and reporting units. There were no additions to our divisions and reporting units during 2023. For each change in reporting unit which arose during 2023, an interim impairment test was conducted before and after the change. In both the "before" and "after" tests, it was concluded that the fair value of the reporting units exceeded the carrying value by a significant amount.

In 2023, we elected to perform quantitative assessments for seven divisions, being Installation Products, IEC LV Motors, Large Motors and Generators, NEMA Motors, Robotics, Machine Automation and E-mobility. For each of these divisions the fair value was determined using a discounted cash flow fair value estimate based on objective information available at the measurement date. The significant assumptions used to develop the estimates of fair value for each division included management's best estimates of the expected future results, as well as discount and terminal growth rates specific to the reporting unit. The fair value estimates were based on assumptions that a market participant would expect to use, but which are inherently uncertain and thus, actual results may differ from those estimates. The fair values for each of the individual reporting units and their associated goodwill were determined using Level 3 measurements. In each of the above quantitative assessments, it was concluded that the fair value of the reporting unit exceeded its carrying value by more than 100 percent. For the remaining divisions, we performed qualitative assessments and determined that it was not more likely than not that the fair value for each of these reporting units was below the carrying value.

Intangible assets are reviewed for recoverability upon the occurrence of certain triggering events (such as a decision to divest a business or projected losses of an entity) or whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. We record impairment charges other than impairments of goodwill in Other income (expense), net, in our Consolidated Income Statements, unless they relate to a discontinued operation, in which case the charges are recorded in Loss from discontinued operations, net of tax.

New accounting pronouncements

For a description of accounting changes and recent accounting pronouncements, including the expected dates of adoption and estimated effects, if any, on our Consolidated Financial Statements, see “Note 2 - Significant accounting policies” to our Consolidated Financial Statements.

Research and development

Each year, we invest significantly in research and development. Our research and development focuses on developing and commercializing the technologies, products and solutions of our businesses that are of strategic importance to our future growth. In 2023, we invested $1,317 million, or approximately 4.1 percent of our 2023 consolidated revenues, on research and development activities in our continuing operations. We also had expenditures of approximately $55 million on order-related development activities. These are customer- and project-specific development efforts that we undertake to develop or adapt equipment and systems to the unique needs of our customers in connection with specific orders or projects.

In addition to continuous product development, and order-related engineering work, we develop platforms for technology applications in our businesses in our research and development laboratories, which operate on a global basis. Through active management of our investment in research and development, we seek to maintain a balance between short-term and long-term research and development programs and optimize our return on investment. We protect these results by holding patents, copyrights and other appropriate intellectual property protection.

To complement our business-focused product development, our businesses invest together in collaborative research activities covering topics such as artificial intelligence, software, sensors, control and optimization, mechatronics and robotics, power electronics, communication technologies, material and manufacturing, electrodynamics and electrical switching technologies. This results in advancing the state-of-the-art technologies used in our products and in common technology platforms that can be applied across multiple product lines.

Universities are incubators of future technology, and one task of our research and development teams is to transform university research into industry-ready technology platforms. We collaborate with multiple universities and research institutions to build research networks and foster new technologies. We believe these collaborations shorten the amount of time required to turn basic ideas into viable products, and they additionally help us to recruit and train new personnel. We have built numerous university strategic relationships with a number of leading institutions in various countries around the world.

We are also leveraging our ecosystem to enhance our innovation efforts and gain speed with strategic partners with complementary competencies. In addition, we invest and collaborate with start-ups worldwide via our corporate venture arm ABB Technology Ventures and our start-up collaboration arm SynerLeap.

The result of our investment in research and development is that ABB is widely recognized for its world-class technology.

Acquisitions and divestments

Acquisitions

During 2023, 2022 and 2021, ABB paid $175 million, $195 million and $212 million to purchase seven, five and two businesses, respectively.

The principal acquisition in 2022 was InCharge Energy, Inc. (In-Charge), where we increased our ownership to a 60 percent controlling interest, expanding the market presence of the E-mobility operating segment, particularly in the North American market. In-Charge is headquartered in Santa Monica, United States, and is a provider of turn-key commercial electric vehicle charging hardware and software solutions. See “Note 4 - Acquisitions, divestments and equity-accounted companies” to our Consolidated Financial Statements.

The principal acquisition in 2021 was ASTI Mobile Robotics Group SL (ASTI). ASTI is headquartered in Burgos, Spain.

There were no significant acquisitions in 2023.

Divestments and spin-offs

Divestment of the Power Conversion Division

In July 2023, we completed the sale of our Power Conversion Division to AcBel Polytech Inc. for cash proceeds of $496 million, net of transaction costs and cash disposed, and recognized a net gain on sale of $59 million. Prior to its disposal, the Power Conversion Division was part of our Electrification Business area. See “Note 4 - Acquisitions, divestments and equity-accounted companies” to our Consolidated Financial Statements.

Spin-off of the Turbocharging Division

In September 2022, the shareholders approved the spin-off of our Turbocharging Division into an independent, publicly traded company, Accelleron Industries AG (Accelleron), which was completed through the distribution of common stock of Accelleron to the stockholders of ABB on October 3, 2022. As a result of the spin-off of this Division, we distributed net assets of $272 million, net of amounts attributable to noncontrolling interests of $12 million, which was reflected as a reduction in Retained earnings. In addition, total accumulated comprehensive income of $95 million, including the cumulative translation adjustment, was reclassified to Retained earnings. Cash and cash equivalents distributed with Accelleron was $172 million. Prior to being spun-off, the Turbocharging Division was part of our Process Automation Business area. See “Note 4 - Acquisitions, divestments and equity-accounted companies” to our Consolidated Financial Statements.

Divestment of the Mechanical Power Transmission Division

In November 2021, we completed the sale of our Mechanical Power Transmission Division (Dodge) to RBC Bearings Inc. for cash proceeds of $2,862 million, net of transaction costs and cash disposed, and recognized a net gain on sale of $2,195 million. Prior to its disposal, the Dodge business was part of our Motion Business area. See “Note 4 - Acquisitions, divestments and equity-accounted companies” to our Consolidated Financial Statements.

Divestment of the Power Grids business

On July 1, 2020, we completed the divestment of 80.1 percent of our former Power Grids business (Hitachi Energy) to Hitachi. As this divestment represented a strategic shift that would have a major effect on our operations and financial results, the results of operations for this business are presented as discontinued operations and the assets and liabilities are reflected as held for sale for all periods presented. For more information on the divestment of the Power Grids business see “Note 3 - Discontinued operations” to our Consolidated Financial Statements.

Hitachi held a call option which required ABB to sell the remaining 19.9 percent interest in Hitachi Energy at a price consistent with what was paid by Hitachi to acquire the initial 80.1 percent or at fair value, if higher. In September 2022, we agreed with Hitachi that we would sell our remaining investment in Hitachi Energy and concurrently settle certain outstanding contractual obligations relating to the initial sale of the business, including certain indemnification guarantees (see Note 15 - Commitments and contingencies). The transaction was completed in December 2022, and we received proceeds of $1,552 million. See “Note 4 - Acquisitions, divestments and equity-accounted companies” to our Consolidated Financial Statements.

Exchange rates

We report our financial results in U.S. dollars. Due to our global operations, a significant amount of our revenues, expenses, assets and liabilities are denominated in other currencies. As a consequence, movements in exchange rates between currencies may affect: (i) our profitability, (ii) the comparability of our results between periods and (iii) the reported carrying value of our assets and liabilities.

We translate non-USD denominated results of operations, assets and liabilities to USD in our Consolidated Financial Statements. Balance sheet items are translated to USD using year-end currency exchange rates. Income statement and cash flow items are translated to USD using the relevant monthly average currency exchange rate.

Increases and decreases in the value of the USD against other currencies will affect the reported results of operations in our Consolidated Income Statements and the value of certain of our assets and liabilities in our Consolidated Balance Sheets, even if our results of operations or the value of those assets and liabilities have not changed in their original currency. As foreign exchange rates impact our reported results of operations and the reported value of our assets and liabilities, changes in foreign exchange rates could significantly affect the comparability of our reported results of operations between periods and result in significant changes to the reported value of our assets, liabilities and stockholders’ equity.

While we operate globally and report our financial results in USD, exchange rate movements between the USD and the EUR, the CNY and the CHF are of particular importance to us due to (i) the location of our significant operations and (ii) our corporate headquarters being in Switzerland.

The exchange rates between the USD and the EUR, the USD and the CHF and the USD and the CNY at December 31, 2023, 2022 and 2021, were as follows:

Exchange rates into $	2023	2022	2021
EUR 1.00	1.11	1.07	1.13
CHF 1.00	1.20	1.08	1.10
CNY 1.00	0.14	0.14	0.16

The average exchange rates between the USD and the EUR, the USD and the CHF and the USD and the CNY for the years ended December 31, 2023, 2022 and 2021, were as follows:

Exchange rates into $	2023	2022	2021
EUR 1.00	1.08	1.05	1.18
CHF 1.00	1.11	1.05	1.09
CNY 1.00	0.14	0.15	0.16

When we incur expenses that are not denominated in the same currency as the related revenues, foreign exchange rate fluctuations could affect our profitability. To mitigate the impact of exchange rate movements on our profitability, it is our policy to enter into forward foreign exchange contracts to manage the foreign exchange transaction risk of our operations.

In 2023, approximately 74 percent of our consolidated revenues were reported in currencies other than the USD. The following percentages of consolidated revenues were reported in the following currencies:

- Euro, approximately 25 percent, and
- Chinese renminbi, approximately 14 percent.

In 2023, approximately 72 percent of our cost of sales and selling, general and administrative expenses were reported in currencies other than the USD. The following percentages of consolidated cost of sales and selling, general and administrative expenses were reported in the following currencies:

- Euro, approximately 22 percent, and
- Chinese renminbi, approximately 12 percent.

We also incur expenses other than cost of sales and selling, general and administrative expenses in various currencies.

The results of operations and financial position of our subsidiaries outside of the U.S. are generally accounted for in the currencies of the countries in which those subsidiaries are located. We refer to these currencies as “local currencies”. Local currency financial information is then translated into USD at applicable exchange rates for inclusion in our Consolidated Financial Statements.

The discussion of our results of operations below provides certain information with respect to orders, revenues, income from operations and other measures as reported in USD (as well as in local currencies). We measure period-to-period variations in local currency results by using a constant foreign exchange rate for all periods under comparison. Differences in our results of operations in local currencies as compared to our results of operations in USD are caused exclusively by changes in currency exchange rates.

While we consider our results of operations as measured in local currencies to be a significant indicator of business performance, local currency information should not be relied upon to the exclusion of U.S. GAAP financial measures. Instead, local currencies reflect an additional measure of comparability and provide a means of viewing aspects of our operations that, when viewed together with the U.S. GAAP results, provide a more complete understanding of factors and trends affecting the business. As local currency information is not standardized, it may not be possible to compare our local currency information to other companies’ financial measures that have the same or a similar title. We encourage investors to review our financial statements and publicly filed reports in their entirety and not to rely on any single financial measure.

Orders

Our policy is to book and report an order when a binding contractual agreement has been concluded with a customer covering, at a minimum, the price and scope of products or services to be supplied, the delivery schedule and the payment terms. The reported value of an order corresponds to the undiscounted value of revenues that we expect to recognize following delivery of the goods or services subject to the order, less any trade discounts and excluding any value added or sales tax. The value of orders received during a given period of time represents the sum of the value of all orders received during the period, adjusted to reflect the aggregate value of any changes to the value of orders received during the period and orders existing at the beginning of the period. These adjustments, which may in the aggregate increase or decrease the orders reported during the period, may include changes in the estimated order price up to the date of contractual performance, changes in the scope of products or services ordered and cancellations of orders. The undiscounted value of future revenues we expect to generate from our orders at any point in time is represented by our order backlog.

The level of orders fluctuates from year to year. Portions of our business involve orders for long-term projects that can take months or years to complete and many larger orders result in revenues in periods after the order is booked. Consequently, the level of orders generally cannot be used to accurately predict future revenues or operating performance. Orders that have been placed can often be cancelled, delayed or modified by the customer. These actions can reduce or delay any future revenues from the order or may result in the elimination of the order.

Performance measures

We evaluate the performance of our operating segments based on orders received, revenues and Operational EBITA. Operational EBITA represents income from operations excluding:

- amortization expense on intangibles arising upon acquisitions (acquisition-related amortization),
- restructuring, related and implementation costs,
- changes in the amount recorded for obligations related to divested businesses occurring after the divestment date (changes in obligations related to divested businesses),
- gains and losses from sale of businesses (including fair value adjustment on assets and liabilities held for sale),
- acquisition- and divestment-related expenses and integration costs,
- certain other non-operational items, as well as
- foreign exchange/commodity timing differences in income from operations consisting of: (a) unrealized gains and losses on derivatives (foreign exchange, commodities, embedded derivatives), (b) realized gains and losses on derivatives where the underlying hedged transaction has not yet been realized, and (c) unrealized foreign exchange movements on receivables/payables (and related assets/liabilities).

Certain other non-operational items generally includes: certain regulatory, compliance and legal costs, certain asset write downs/impairments and certain other fair value changes, changes in estimates relating to opening balance sheets of acquired businesses (changes in pre-acquisition estimates), as well as other items which are determined by management on a case-by-case basis.

See “Note 23 - Operating segment and geographic data” to our Consolidated Financial Statements for a reconciliation of the total Operational EBITA to income from continuing operations before taxes.

Transactions with affiliates and associates

In the normal course of our business, we purchase products from, sell products to and engage in other transactions with entities in which we hold an equity interest. The amounts involved in these transactions are not material to ABB Ltd. Prior to its sale in December 2022 our most significant equity method investment was in Hitachi Energy Ltd (see “Note 4 - Acquisitions, divestments and equity-accounted companies” for details). Also, in the normal course of our business, we engage in transactions with businesses that we have divested. We believe that the terms of the transactions we conduct with these companies are negotiated on an arm’s length basis.

Analysis of results of operations

The discussion in the following sections below provides a comparative analysis between 2023 and 2022. See the sections under “Operating and Financial Review and Prospects” in our 2022 Annual Report for a comparative discussion and analysis between 2022 and 2021, with the exception of subsections "Electrification" and "Corporate and Other" under "Business analysis" below, where a comparative analysis between 2022 and 2021 has been provided to reflect the realignment of E-mobility (see “Note 23 - Operating segment and geographic data” for details).

Our consolidated results from operations were as follows:

Income Statement Data:

($ in millions, except per share data in $)	**2023**	**2022**	**2021**
Revenues	32,235	29,446	28,945
Cost of sales	(21,021)	(19,736)	(19,478)
Gross profit	**11,214**	**9,710**	**9,467**
Selling, general and administrative expenses	(5,543)	(5,132)	(5,162)
Non-order related research and development expenses	(1,317)	(1,166)	(1,219)
Other income (expense), net	517	(75)	2,632
Income from operations	**4,871**	**3,337**	**5,718**
Interest and dividend income	165	72	51
Interest and other finance expense	(275)	(130)	(148)
Non-operational pension (cost) credit	17	115	166
Income tax expense	(930)	(757)	(1,057)
Income from continuing operations, net of tax	**3,848**	**2,637**	**4,730**
Loss from discontinued operations, net of tax	(24)	(43)	(80)
Net income	**3,824**	**2,594**	**4,650**
Net income attributable to noncontrolling interests and redeemable noncontrolling interests	(79)	(119)	(104)
Net income attributable to ABB	**3,745**	**2,475**	**4,546**
Amounts attributable to ABB shareholders:			
Income from continuing operations, net of tax	3,769	2,517	4,625
Loss from discontinued operations, net of tax	(24)	(42)	(79)
Net income	3,745	2,475	4,546
Basic earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	2.03	1.33	2.31
Loss from discontinued operations, net of tax	(0.01)	(0.02)	(0.04)
Net income	2.02	1.30	2.27
Diluted earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	2.02	1.32	2.29
Loss from discontinued operations, net of tax	(0.01)	(0.02)	(0.04)
Net income	2.01	1.30	2.25

A more detailed discussion of the orders, revenues, income from operations and Operational EBITA for our Business areas follows in the sections of “Business analysis” below for Electrification, Motion, Process Automation, Robotics & Discrete Automation, and Corporate and Other. Orders and revenues of our businesses include intersegment transactions which are eliminated in the “Corporate and Other” line in the tables below.

Orders

				% Change	
($ in millions)	2023	2022	2021	2023	2022
Electrification	15,189	15,182	13,850	0%	10%
Motion	8,222	7,896	7,616	4%	4%
Process Automation	7,535	6,825	6,779	10%	1%
Robotics & Discrete Automation	3,066	4,116	3,844	(26)%	7%
Total Business areas	**34,012**	**34,019**	**32,089**	**0%**	**6%**
Corporate and Other					
E-mobility, Non-core and divested businesses	720	787	593	(9)%	33%
Intersegment eliminations	(914)	(818)	(814)	n.a.	n.a.
Total	**33,818**	**33,988**	**31,868**	**(1)%**	**7%**

In 2023, total orders decreased 1 percent compared with 2022 (increased 1 percent in local currencies). The decrease reflects the steep decline in orders for the Robotics & Discrete Automation Business area as customers normalized order patterns in response to shortened delivery lead times, as well as an overall weakness in the Robotics market outside the automotive segment. Orders in the Electrification Business area were steady despite the sale of the Power Conversion Division in July 2023. The Process Automation Business area had a strong increase, reflecting the receipt of higher large orders which more than offset the impact from the spin-off of the Turbocharging Division in October 2022 which affected total order growth by 1 percent. The increase in Orders in the Motion Business area reflects strong demand in long-cycle markets and project businesses. For additional information about individual Business area order performance, refer to the relevant sections of “Business analysis” below.

We determine the geographic distribution of our orders based on the location of the ultimate destination of the products’ end use, if known, or the location of the customer. The geographic distribution of our consolidated orders was as follows:

				% Change	
($ in millions)	2023	2022	2021	2023	2022
Europe	11,458	11,778	11,857	(3)%	(1)%
The Americas	12,437	11,825	9,940	5%	19%
of which: United States	9,204	8,920	7,453	3%	20%
Asia, Middle East and Africa	9,923	10,385	10,071	(4)%	3%
of which: China	4,488	5,087	5,036	(12)%	1%
Total	**33,818**	**33,988**	**31,868**	**(1)%**	**7%**

In 2023, orders increased 5 percent in the Americas (5 percent in local currencies), with orders growing in the U.S., Canada and Chile. The increase in the U.S. includes two large orders with multi-year fulfillment periods for $285 million and $150 million, respectively. In Europe, orders decreased 3 percent (4 percent in local currencies). Orders were higher in Norway and the United Kingdom while they declined in Switzerland and Poland. Despite the impact of an order reversal of approximately $170 million recorded in 2022, orders decreased in Germany as well. In Asia, Middle East and Africa, orders decreased 4 percent (increased 1 percent in local currencies). In local currencies, order growth in India and Saudi Arabia more than offset the decline in China. The spin-off of the Turbocharging Division in October 2022 also had a negative impact of 3 percent on the order growth in Asia, Middle East and Africa and 2 percent in Europe.

Order backlog

December 31, ($ in millions)	2023	2022	2021	% Change 2023	% Change 2022
Electrification	6,808	6,404	5,105	6%	25%
Motion	5,343	4,726	3,749	13%	26%
Process Automation	7,519	6,229	6,079	21%	2%
Robotics & Discrete Automation	2,141	2,679	1,919	(20)%	40%
Total Business areas	**21,811**	**20,038**	**16,852**	**9%**	**19%**
Corporate and Other					
E-mobility, Non-core and divested businesses	508	552	467	(8)%	18%
Intersegment eliminations	(752)	(723)	(712)	n.a.	n.a.
Total	**21,567**	**19,867**	**16,607**	**9%**	**20%**

At December 31, 2023, consolidated order backlog was 9 percent higher (7 percent in local currencies) compared to December 31, 2022. Order backlog increased in all Business areas except Robotics & Discrete Automation. The order backlog in the Process Automation Business area was supported by a strong order increase in most Divisions except the Measurement & Analytics Division. The increase also includes the impact of two large orders with multi-year fulfillment periods for $285 million and $150 million, respectively, in the Marine & Ports Division. The order backlog in the Electrification Business area was driven by order growth in the Smart Power Division, partially offset by a decrease from the divestment of the Power Conversion Division in July 2023. An increase in orders in both the Systems Drives and Traction Divisions contributed to the increase in the order backlog in the Motion Business area while the decrease in the order backlog in the Robotics & Discrete Automation Business area was a result of the decline in orders in both Divisions.

Revenues

($ in millions)	2023	2022	2021	% Change 2023	% Change 2022
Electrification	14,584	13,619	12,894	7%	6%
Motion	7,814	6,745	6,925	16%	(3)%
Process Automation	6,270	6,044	6,259	4%	(3)%
Robotics & Discrete Automation	3,640	3,181	3,297	14%	(4)%
Total Business areas	**32,308**	**29,589**	**29,375**	**9%**	**1%**
Corporate and Other					
E-mobility, Non-core and divested businesses	769	653	348	18%	88%
Intersegment eliminations	(842)	(796)	(778)	n.a.	n.a.
Total	**32,235**	**29,446**	**28,945**	**9%**	**2%**

In 2023, revenues increased by 9 percent (11 percent in local currencies). The normalization of supply chains facilitated strong execution of our order backlog into revenue growth during the year. All Business areas reported revenue growth, with both increased volumes and product prices. Growth was highest in the Robotics & Discrete Automation and Motion Business areas. The increase in the Robotics & Discrete Automation Business area reflects improved order backlog execution as supply chain constraints eased in 2023. The Electrification Business area achieved a high single-digit growth rate despite the adverse impact from the divestment of the Power Conversion Division in July 2023, while the Process Automation Business area achieved single-digit growth in local currencies despite the spin-off of the Turbocharging Division in October 2022. These two business portfolio changes had a combined negative impact on the growth in total Revenues of 2 percent. For additional analysis of revenues for each of the Business areas, refer to the relevant sections of “Business analysis” below.

We determine the geographic distribution of our revenues based on the location of the ultimate destination of the products' end use, if known, or the location of the customer. The geographic distribution of our consolidated revenues was as follows:

($ in millions)	2023	2022	2021	% Change 2023	% Change 2022
Europe	11,568	10,285	10,529	12%	(2)%
The Americas	11,090	9,573	8,686	16%	10%
of which: United States	8,248	7,023	6,397	17%	10%
Asia, Middle East and Africa	9,577	9,588	9,730	0%	(1)%
of which: China	4,468	4,696	4,932	(5)%	(5)%
Total	**32,235**	**29,446**	**28,945**	**9%**	**2%**

In 2023, revenues increased 16 percent in the Americas (15 percent in local currencies), where revenues in the United States increased 17 percent (17 percent in local currencies). Revenues in the Americas also experienced strong growth in Canada, Brazil, Argentina and Chile. In Europe, revenues increased 12 percent (11 percent in local currencies) and were higher across all Business areas. Revenue growth was the highest in Italy, Turkiye, Sweden, Norway and the United Kingdom. In Asia, Middle East and Africa, revenues were flat (increased 5 percent in local currencies) compared to 2022. Revenues grew strongest in India and Saudi Arabia while they decreased in China and South Korea. The spin-off of the Turbocharging Division in October 2022 also had a negative impact of 3 percent on the revenue growth in Asia, Middle East and Africa, 2 percent in Europe and 1 percent in the Americas.

Cost of sales

Cost of sales consists primarily of labor, raw materials and component costs but also includes indirect production costs, expenses for warranties, contract and project charges, as well as order-related development expenses incurred in connection with projects for which corresponding revenues have been recognized.

In 2023, costs of sales increased 7 percent (8 percent in local currencies) to $21,021 million. Cost of sales as a percentage of revenues decreased to 65.2 percent from 67.0 percent in 2022. The increase in the gross margin was primarily due to the stabilization of commodity and freight costs and certain mitigation actions taken in response to higher labor costs as well as some positive impact from changes in the product portfolio. The improvement in 2023 was realized in all Business areas.

Selling, general and administrative expenses

The components of selling, general and administrative expenses were as follows:

($ in millions)	2023	2022	2021
Selling expenses	3,415	3,248	3,281
General and administrative expenses	2,128	1,884	1,881
Total	**5,543**	**5,132**	**5,162**

In 2023, general and administrative expenses increased 13 percent (15 percent in local currencies) compared to 2022. As a percentage of revenues, general and administrative expenses slightly increased to 6.6 percent from 6.4 percent in 2022. The increase represents inflation impacts as well as increased business transformation and employee short-term incentive compensation costs. General and administrative expenses in 2023 also includes the ongoing costs required to deliver services to Hitachi Energy Ltd and Accelleron under transition service agreements for which we are compensated. We have recorded $121 million in Other income (expense), net, during 2023 compared to $162 million in 2022 related to these agreements with Hitachi Energy and Accelleron.

In 2023, selling expenses increased 5 percent (5 percent in local currencies) compared to 2022 and was higher across all Business areas apart from Process Automation. Selling expenses as a percentage of orders increased from 9.6 percent in 2022 to 10.1 percent in 2023.

Non-order related research and development expenses

In 2023, non-order related research and development expenses increased 13 percent (14 percent in local currencies) compared to 2022. In 2023, non-order related research and development expenses as a percentage of revenues remained similar to prior year levels (4.1 percent in 2023 compared to 4.0 percent in 2022) as we continued investing in research and development in line with revenue growth.

Other income (expense), net

($ in millions)	2023	2022	2021
Income from provision of services under transition services agreements	175	221	173
Net gain from sale of property, plant and equipment	116	84	38
Gain (loss) from change in fair value of investments in equity securities	3	52	108
Brand income from Hitachi Energy	39	57	89
Net gain from sale of businesses and equity-accounted investments[(1)]	101	36	2,193
Asset impairments	(49)	(55)	(33)
Income (loss) from equity-accounted companies	(16)	(102)	(100)
Restructuring and restructuring-related expenses[(2)]	(20)	(227)	(48)
Regulatory penalties in connection with Kusile project	—	(313)	—
Other income (expense)	168	172	212
Total	**517**	**(75)**	**2,632**

(1) 2022 includes gain on sale of the remaining 19.9 percent investment in Hitachi Energy Ltd.
(2) Excluding asset impairments

In 2023, Other income (expense), net, was a gain of $517 million compared to a loss of $75 million in 2022. The primary reason for the change was that in 2022, we recorded costs of $313 million associated with regulatory penalties assessed in connection with the Kusile project and $195 million of restructuring and restructuring-related expenses in connection with the exit of the full train retrofit business. The amount in 2022 also included higher losses from equity-accounted companies which principally represented losses in Hitachi Energy. In 2023, we recorded higher gains from sales of businesses primarily due to the sale of the Power Conversion Division. In 2022, we recorded a gain of $43 million relating to the sale of the remaining 19.9 percent of Hitachi Energy to Hitachi. In 2023, we recorded lower gains for net fair value increases in various equity investments compared to 2022, the most significant of which in 2022 related to InCharge Energy, Inc.

Income from operations

				% Change	
($ in millions)	2023	2022	2021	2023	2022
Electrification	2,800	2,140	1,827	31%	17%
Motion	1,390	1,092	3,276	27%	(67)%
Process Automation	947	663	713	43%	(7)%
Robotics & Discrete Automation	446	247	269	81%	(8)%
Total Business areas	**5,583**	**4,142**	**6,085**	**35%**	**(32)%**
Corporate and Other	(711)	(804)	(371)	n.a.	n.a.
Intersegment elimination	(1)	(1)	4	n.a.	n.a.
Total	**4,871**	**3,337**	**5,718**	**46%**	**(42)%**

In 2023 and 2022, changes in income from operations were a result of the factors discussed above and in “Business analysis” below.

Financial income and expenses

Financial income and expenses include Interest and dividend income and Interest and other finance expense.

Interest and other finance expense includes interest expense on our debt, the amortization of upfront transaction costs associated with long-term debt and committed credit facilities, commitment fees on credit facilities, foreign exchange gains and losses on financial items, and gains and losses on marketable securities. In addition, interest costs relating to uncertain tax positions are included within interest expense.

($ in millions)	2023	2022	2021
Interest and dividend income	165	72	51
Interest and other finance expense	(275)	(130)	(148)

In 2023, both interest income and interest expense reflect increases in market interest rates especially for the U.S. dollar and the euro. Interest on cash deposits reflects primarily interest income on U.S. dollar deposits. Interest expense on our external debt increased due to higher debt levels as well as higher interest rates on floating rate obligations. Due to our internal funding structure and the resulting currency hedging requirements, our interest expense reflects more the short-term Swiss franc interest rates than the direct underlying interest costs incurred in the currencies of our external debt, especially the euro.

Non-operational pension (cost) credit

A non-operational pension credit of $17 million was recorded in 2023 compared to a $115 million credit in 2022. The decrease in the non-operational pension credit compared to 2022 is primarily due to higher interest costs on the benefit obligations (see “Note 17 - Employee benefits” to our Consolidated Financial Statements).

Income tax expense

($ in millions)	2023	2022	2021
Income from continuing operations before taxes	4,778	3,394	5,787
Income tax expense	(930)	(757)	(1,057)
Effective tax rate for the year	19.5%	22.3%	18.3%

In 2023, the effective tax rate decreased to 19.5 percent from 22.3 percent in 2022. In 2023, the effective tax rate benefited from a favorable resolution of an uncertain tax position early in the year which reduced the effective tax rate by approximately 4 percentage points. In 2022, the effective tax was approximately 2 percentage points higher due to the non-deductible regulatory penalties in connection with the Kusile project and 3 percentage points higher due to not benefiting losses in entities having a participation exemption. The effective tax rate in 2022 also reflects a benefit of approximately 6 percentage points due to changes in assessment of recoverability of deferred tax assets.

See “Note 16 - Income taxes” to our Consolidated Financial Statements for additional information.

Income from continuing operations, net of tax

As a result of the factors discussed above, compared to 2022, Income from continuing operations, net of tax, increased by $1,211 million to $3,848 million in 2023.

Loss from discontinued operations, net of tax

In 2020, we completed the divestment of 80.1 percent of our former Power Grids business to Hitachi. As a result of the sale, substantially all Power Grids related assets and liabilities have been sold. As this divestment represented a strategic shift that would have a major effect on our operations and financial results, the results of operations for this business were presented as discontinued operations. In addition, we also have retained obligations (primarily for environmental and taxes) related to other businesses disposed or otherwise exited that qualified as discontinued operations. Changes to these retained obligations are also included in Loss from discontinued operations, net of tax.

For additional information on the divestment and discontinued operations, see “Note 3 - Discontinued operations” to our Consolidated Financial Statements.

Net income attributable to ABB

As a result of the factors discussed above, compared to 2022, Net income attributable to ABB increased by $1,270 million to $3,745 million in 2023.

Earnings per share attributable to ABB shareholders

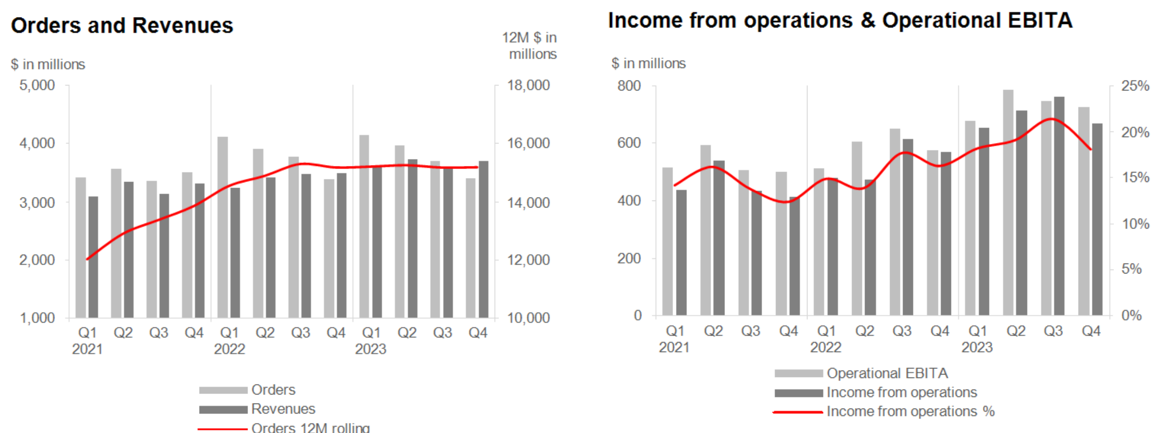
(in $)	2023	2022	2021
Basic earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	2.03	1.33	2.31
Loss from discontinued operations, net of tax	(0.01)	(0.02)	(0.04)
Net income	2.02	1.30	2.27
Diluted earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	2.02	1.32	2.29
Loss from discontinued operations, net of tax	(0.01)	(0.02)	(0.04)
Net income	2.01	1.30	2.25

Basic earnings per share is calculated by dividing income by the weighted-average number of shares outstanding during the year. Diluted earnings per share is calculated by dividing income by the weighted-average number of shares outstanding during the year, assuming that all potentially dilutive securities were exercised, if dilutive. Potentially dilutive securities comprise: outstanding written call options and outstanding options and shares granted subject to certain conditions under our share-based payment arrangements. See “Note 20 - Earnings per share” to our Consolidated Financial Statements.

Business analysis

Electrification Business area

The financial results of our Electrification Business area were as follows:



				% Change	
($ in millions)	2023	2022	2021	2023	2022
Orders	15,189	15,182	13,850	0%	10%
Order backlog at December 31,	6,808	6,404	5,105	6%	25%
Revenues	14,584	13,619	12,894	7%	6%
Income from operations	2,800	2,140	1,827	31%	17%
Operational EBITA	2,937	2,343	2,120	25%	11%

Orders

Approximately two-thirds of the Business area's orders are for products with short lead times; these orders are usually recorded and delivered within a three-month period and thus are generally considered as short-cycle. The remainder is comprised of smaller project orders that require longer lead times, as well as larger solutions requiring engineering and installation. Approximately half of the Business area's orders are received via third-party distributors. As a consequence, end-customer market data is based partially on management estimates.

In 2023, orders were flat (increased 1 percent in local currencies) compared to 2022, despite the divestment of the Power Conversion Division in July 2023, which negatively impacted the growth rate by approximately 2 percent. Order growth was strong in the Smart Power Division, partially offset by decreased demand in the Smart Buildings and Installation Products Divisions. Orders improved on strength in demand in customer segments such as data centers, utilities, chemical, and oil and gas. This was partially offset by weakness in the building segment, the Electrification Business area's largest end-user segment, led by a slowdown in residential construction while commercial construction showed positive momentum, mainly in the United States.

In 2022, orders increased 10 percent (16 percent in local currencies) as demand improved across all key end-user segments. Demand in the buildings segment was robust, with strong growth particularly in the non-residential building sector. Solid growth in the residential building sector in the first half of the year was partially offset by a slowdown in the second half of 2022, particularly in certain European markets. We experienced strong growth in data centers, food and beverage, infrastructure and renewables. Demand from the oil and gas segment increased significantly during the year, while growth in the utilities and rail segments was solid even if geographically uneven.

The geographic distribution of orders for our Electrification Business area was as follows:

($ in millions)	2023	2022	2021
Europe	4,629	4,595	4,789
The Americas	6,567	6,509	5,000
of which: United States	5,001	5,062	3,733
Asia, Middle East and Africa	3,993	4,078	4,061
of which: China	1,815	1,992	2,103
Total	**15,189**	**15,182**	**13,850**

In 2023, orders in Europe increased 1 percent (decreased 1 percent in local currencies) as a result of growth in markets such as the United Kingdom, Turkiye and Ireland. This was partially offset by a decrease in demand in Germany, particularly in the building segment, as well as in the Netherlands and France. Orders in the Americas increased 1 percent (1 percent in local currencies) despite the divestment of the Power Conversion Division, which had a large market presence in the Americas and negatively impacted growth in the region by 2 percent. Orders decreased 2 percent in Asia, Middle East and Africa (increased 5 percent in local currencies) as a lower level of orders in China, reflecting a slowdown in demand, were more than offset by strong growth in Saudi Arabia and India.

In 2022, orders in local currencies increased in all regions. The pandemic-related challenges improved compared to 2021 in most geographies. Orders in the Americas increased 30 percent (31 percent in local currencies), with demand strengthening across all key markets, led by increases in the U.S. and Brazil. Orders in Europe decreased 4 percent, reflecting the weakening of many European currencies against the U.S. dollar, but increased 6 percent in local currencies, with growth across the region including in key markets such as Italy and Germany. Orders in Asia, Middle East and Africa were on the same level as in 2021, but increased 6 percent in local currencies, with strong order growth in India throughout the year offsetting a slowdown in China. Orders in China were lower in most end-user segments mainly as business activity was hampered by pandemic-related measures and also reflected a challenging comparable due to strong order performance in 2021.

Order backlog

In 2023, the order backlog increased 6 percent (6 percent in local currencies). The divestment of the Power Conversion Division in July 2023 negatively impacted the growth rate by approximately 8 percent. Order backlog benefited from the strong order intake in the Smart Power Division.

In 2022, order backlog increased 25 percent (32 percent in local currencies). Order backlog benefited from strong order intake, but was also impacted by execution challenges caused by material shortages, transportation constraints as well as pandemic-related production pressures in some local markets.

Revenues

In 2023, revenues increased 7 percent (8 percent in local currencies) compared to 2022. The divestment of the Power Conversion Division in July 2023 negatively impacted the growth rate by approximately 2 percent. The supply chain tightness that negatively impacted revenues in 2022 normalized in 2023, however, inflation and labor market shortages continued to pose challenges. Pricing actions taken to mitigate increasing material, labor and transportation costs again contributed strongly to the higher revenue level and accounted for almost half of the revenue growth in 2023, excluding the negative impact from the divestment of the Power Conversion Division. The revenue growth was led by the Distribution Solutions and Smart Power Divisions, reflecting high demand as well as strong order backlog execution, while revenues in the Smart Buildings and Installation Products Divisions decreased.

In 2022, revenues increased 6 percent (12 percent in local currencies). Revenues in local currencies increased in all divisions reflecting the strong demand across regions and end-user segments, however growth was hampered by component shortages, logistics challenges and a tight labor market. Pricing actions taken to mitigate increasing material, labor and transportation costs contributed strongly to the higher revenue level and accounted for around three quarters of the revenue growth in 2022. The revenue growth was led by the Smart Power Division, mirroring the very high demand in this segment. There was also strong double-digit revenue growth in local currencies in the Power Conversion Division as well as in the Installation Products Division.

The geographic distribution of revenues for our Electrification Business area was as follows:

($ in millions)	2023	2022	2021
Europe	4,641	4,318	4,489
The Americas	5,968	5,181	4,418
of which: United States	4,480	3,791	3,252
Asia, Middle East and Africa	3,975	4,120	3,987
of which: China	1,797	1,969	2,079
Total	**14,584**	**13,619**	**12,894**

In 2023, revenues in the Americas increased 15 percent (15 percent in local currencies) compared to 2022, despite the divestment of the Power Conversion Division, which negatively impacted growth in the region by 4 percent. Revenues increased 7 percent (5 percent in local currencies) in Europe, led by growth in the United Kingdom, Turkiye and Italy and supported by the strengthening of key European currencies against the U.S. dollar. Revenues in Asia, Middle East and Africa decreased 4 percent (increased 3 percent in local currencies), mainly reflecting lower revenues in China caused by a slowdown in demand.

In 2022, revenues in the Americas increased 17 percent (18 percent in local currencies) with widespread regional growth. Revenues increased 3 percent (10 percent in local currencies) in Asia, Middle East and Africa, supported by strong growth in India, while revenues in China were lower than the previous year. Revenues in Europe decreased 4 percent, impacted by weakening currencies in many European countries versus the U.S. dollar, while revenues in the region grew 6 percent in local currencies.

Income from operations

In 2023, income from operations increased 31 percent, supported by higher volumes as well as pricing actions to offset the adverse impact from cost inflation, primarily in labor. Gains from sale of businesses amounted to $75 million primarily reflecting the gain from the divestment of the Power Conversion Division in July 2023. Benefits of savings realized from ongoing restructuring and cost savings programs also positively influenced income from operations. These positive effects were partially dampened by widespread inflationary cost pressures in 2023. The level of research and development spending was higher in 2023 than in 2022, driven mainly by our expansion in the United States, as well as increased investments in sustainability and in our service offering. Restructuring-related expenses and implementation costs increased in 2023 compared to 2022 mainly due to right-sizing actions following lower demand in certain market segments. Changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, negatively impacted income from operations in 2023 by 1 percent.

In 2022, income from operations increased 17 percent supported by higher volumes as well as strong price management, which helped offset the adverse impact from cost inflation in raw materials, freight and labor. Benefits of savings realized from ongoing restructuring and cost savings programs also positively influenced income from operations. Restructuring-related expenses and implementation costs in our operating divisions were lower in 2022 than in 2021, mainly due to the substantial completion of the integration of GEIS, which we acquired in 2018. Also, lower GEIS integration costs contributed to the higher income from operations in 2022 compared to 2021. These positive effects were partially dampened by widespread inflationary cost pressures in 2022, as well as higher personnel expenses driven by a ramp-up of manufacturing capacity to meet higher demand. Changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, negatively impacted income from operations by approximately 6 percent.

Operational EBITA

The reconciliation of Income from operations to Operational EBITA for the Electrification Business area was as follows:

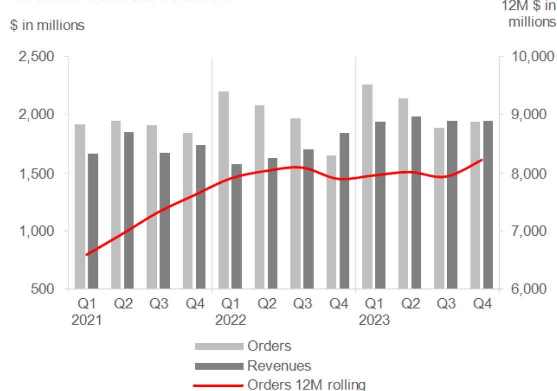
($ in millions)	2023	2022	2021
Income from operations	**2,800**	**2,140**	**1,827**
Acquisition-related amortization	88	104	115
Restructuring, related and implementation costs	76	28	66
Changes in obligations related to divested businesses	1	1	—
Gains and losses from sale of businesses	(75)	(1)	13
Acquisition- and divestment-related expenses and integration costs	30	36	69
Certain other non-operational items	16	41	7
FX/commodity timing differences in income from operations	1	(6)	23
Operational EBITA	**2,937**	**2,343**	**2,120**

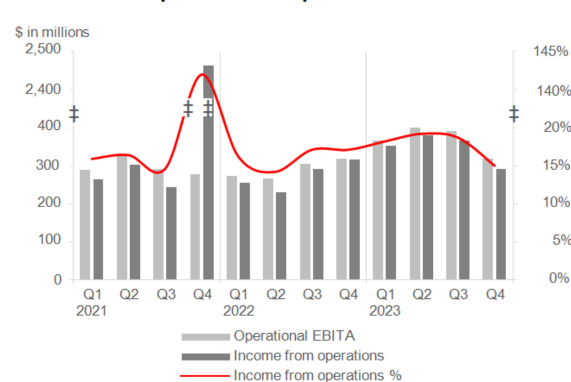
In 2023, Operational EBITA increased 25 percent (27 percent excluding the impact from changes in foreign currency exchange rates) compared to 2022, primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

In 2022, Operational EBITA increased 11 percent (20 percent excluding the impact from changes in foreign currency exchange rates) compared to 2021, primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

Motion Business area

The financial results of our Motion Business area were as follows:





($ in millions)	2023	2022	2021	% Change 2023	% Change 2022
Orders	8,222	7,896	7,616	4%	4%
Order backlog at December 31,	5,343	4,726	3,749	13%	26%
Revenues	7,814	6,745	6,925	16%	(3)%
Income from operations	1,390	1,092	3,276	27%	(67)%
Operational EBITA	1,475	1,163	1,183	27%	(2)%

Orders

In 2023, orders increased 4 percent, (5 percent in local currencies) compared to 2022. The Business area experienced strong double-digit order growth in long-cycle markets and project businesses served by the System Drives, Large Motors and Generators, and Traction Divisions, partially offset by decreased demand in the short-cycle product-related divisions. The Business area recorded strong double-digit order growth in process-related segments such as chemical, oil and gas, and also growth in cement, mining and minerals. Transport segments related to rail and marine also experienced order growth during the year while orders declined in the buildings segment (heating, ventilation and air conditioning) as well as food and beverage. Overall, the Business area has benefited from the market shift towards carbon reduction and increased energy efficiency in critical processes, such as the electrification of propulsion systems and investments in hydrogen and renewables.

The geographic distribution of orders for our Motion Business area was as follows:

($ in millions)	2023	2022	2021
Europe	2,797	2,710	2,617
The Americas	2,715	2,583	2,677
of which: United States	2,186	2,128	2,200
Asia, Middle East and Africa	2,710	2,603	2,322
of which: China	1,300	1,314	1,232
Total	**8,222**	**7,896**	**7,616**

In 2023, orders increased 3 percent (1 percent in local currencies) in Europe as orders increased particularly in Norway, Austria, Finland and Spain partially offset by lower orders in Sweden, France, Switzerland and Italy. In Asia, Middle East and Africa, orders increased 4 percent (10 percent in local currencies) driven by growth in India and China, with the latter impacted by a weakened Chinese currency. In the Americas, orders increased 5 percent (4 percent in local currencies) driven by increased orders in the U.S. and Canada.

Order backlog

Order backlog in 2023 increased 13 percent (9 percent in local currencies) compared to 2022 reaching $5.3 billion. Order backlog increase was driven by large orders in the long-cycle business. In the short-cycle business, supply chain constraints eased from the prior year and resulted in a reduction of the high backlog built up in 2022.

Revenues

In 2023, revenues increased 16 percent (17 percent in local currencies) compared to 2022. Strong revenue growth was delivered across all divisions, both in the short- and long-cycle businesses. The revenue growth was supported by strong demand and execution of the order backlog, as well as a positive full-year impact from successful price increases in the prior year.

The geographic distribution of revenues for our Motion Business area was as follows:

($ in millions)	2023	2022	2021
Europe	2,704	2,271	2,258
The Americas	2,650	2,208	2,396
of which: United States	2,176	1,823	1,974
Asia, Middle East and Africa	2,460	2,266	2,271
of which: China	1,256	1,245	1,256
Total	**7,814**	**6,745**	**6,925**

In 2023, revenues in Europe increased 19 percent (16 percent in local currencies) compared to 2022. The revenue increase was driven by Italy, Germany, Sweden, Turkiye and Spain while revenues declined in Switzerland. In Asia, Middle East and Africa, revenues increased by 9 percent (14 percent in local currencies) with solid revenue growth in India, Australia and China with the latter partially impacted by a weakened Chinese currency. In the Americas, revenues increased 20 percent (20 percent in local currencies) with strong growth in the U.S., Canada and Mexico.

Income from operations

In 2023, income from operations increased 27 percent. The increase was driven by higher revenues reflecting a strong demand, solid order backlog execution and benefits from a strong price execution which more than offset cost inflation related to labor and materials. Profitability was also supported by continued cost discipline and a positive divisional mix. All divisions apart from the Traction and IEC LV Motors Divisions reported strong profitability improvements in 2023. Changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, positively impacted income from operations by approximately 1 percent.

Operational EBITA

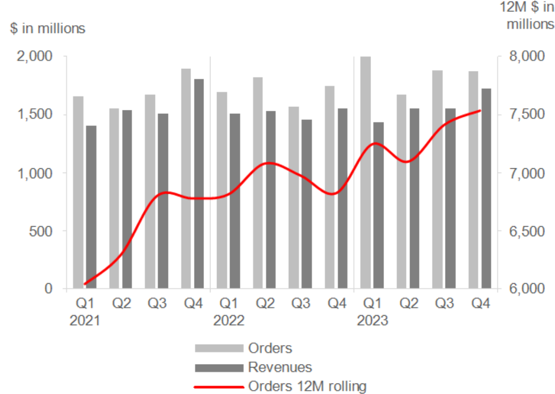
The reconciliation of Income from operations to Operational EBITA for the Motion Business area was as follows:

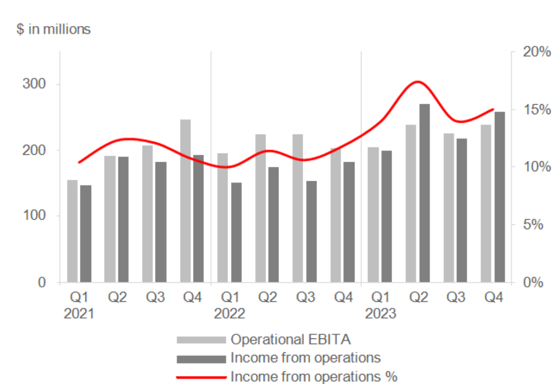
($ in millions)	**2023**	**2022**	**2021**
Income from operations	**1,390**	**1,092**	**3,276**
Acquisition-related amortization	35	31	43
Restructuring, related and implementation costs	46	16	22
Gains and losses from sale of businesses	—	8	(2,196)
Acquisition- and divestment-related expenses and integration costs	17	15	26
Certain other non-operational items	6	—	1
FX/commodity timing differences in income from operations	(19)	1	11
Operational EBITA	**1,475**	**1,163**	**1,183**

In 2023, Operational EBITA increased 27 percent (27 percent excluding the impact from changes in foreign currency exchange rates) compared to 2022, primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

Process Automation Business area

The financial results of our Process Automation Business area were as follows:





				% Change	
($ in millions)	**2023**	**2022**	**2021**	**2023**	**2022**
Orders	7,535	6,825	6,779	10%	1%
Order backlog at December 31,	7,519	6,229	6,079	21%	2%
Revenues	6,270	6,044	6,259	4%	(3)%
Income from operations	947	663	713	43%	(7)%
Operational EBITA	909	848	801	7%	6%

Orders

In 2023, orders increased 10 percent (12 percent in local currencies) compared to 2022. Order growth was negatively impacted by approximately 12 percent due to the spin-off of the Turbocharging Division in October 2022. Orders grew in all divisions excluding the Measurement & Analytics Division and was strong in long-cycle projects, reflecting a significant increase in large orders. Strong demand was seen for the product, systems and service businesses and supported by most customer segments. Demand was particularly strong in sectors such as marine and ports, and oil and gas, with additional positive developments in the areas of mining and metals. Customer activities increased in the power generation segments, and were flat in chemicals and refining, whereas demand in pulp and paper was lower. Customer interest continued to be high in the hydrogen segment, which remains a growing part of the business.

The geographic distribution of orders for our Process Automation Business area was as follows:

($ in millions)	2023	2022	2021
Europe	2,662	2,361	2,614
The Americas	2,441	1,994	1,645
of which: United States	1,506	1,201	1,047
Asia, Middle East and Africa	2,432	2,470	2,520
of which: China	729	748	821
Total	**7,535**	**6,825**	**6,779**

Orders in Europe increased 13 percent (14 percent in local currencies). In local currencies, orders increased in Norway, Italy and Germany, however the increase in Germany included the impact of an order reversal of approximately $170 million recorded in 2022. Orders in Asia, Middle East and Africa decreased 2 percent (increased 2 percent in local currencies). Higher orders in Saudi Arabia were more than offset by lower order volumes in Japan, Singapore and South Africa. In the Americas, orders increased 22 percent (21 percent in local currencies) supported by strong demand in the U.S. and Canada, with the former impacted by two large orders with multi-year fulfillment periods for $285 million and $150 million, respectively, in the Marine & Ports Division. This is partially offset by declined demand in Argentina which received several large order bookings in 2022.

Order backlog

In 2023, Order backlog increased 21 percent (19 percent in local currencies) compared to 2022. Order backlog increased in all divisions except the Measurement & Analytics Division due to strong order intake during 2023. The increase in Order backlog also includes the impact of the two large orders with multi-year fulfillment periods in the Marine & Ports Division.

Revenues

In 2023, revenues increased 4 percent (increased 5 percent in local currencies) in 2023. Revenue growth was negatively impacted by approximately 11 percent due to the spin-off of the Turbocharging Division in October 2022. Revenues increased in all divisions, reflecting strong execution of the order backlog in the long-cycle businesses and strong underlying demand in the current year.

The geographic distribution of revenues for our Process Automation Business area was as follows:

($ in millions)	2023	2022	2021
Europe	2,311	2,266	2,439
The Americas	1,741	1,569	1,439
of which: United States	1,077	943	836
Asia, Middle East and Africa	2,218	2,209	2,381
of which: China	708	668	742
Total	**6,270**	**6,044**	**6,259**

Revenues in 2023 were 11 percent higher (10 percent in local currencies) in the Americas, flat (5 percent higher in local currencies) in Asia, Middle East and Africa and 2 percent higher (2 percent in local currencies) in Europe compared to 2022. The spin-off of the Turbocharging Division in October 2022 had a negative impact on the growth rate in 2023 of 10 percent in the Americas, 12 percent in Asia, Middle East and Africa, and 12 percent in Europe. In the Americas, revenue growth was driven by the U.S. and Argentina. In Asia, Middle East and Africa, revenues were higher in India and Saudi Arabia but declined in South Korea and the United Arab Emirates. Growth in Europe was reported in key markets including Norway, Sweden and Poland.

Income from operations

In 2023, income from operations increased 43 percent compared to 2022, driven by strong business performance in all divisions, partly offset by the impact of the spin-off of the Turbocharging Division. All divisions reported higher income from operations. Growth was driven by higher revenue volumes, continued operational improvements in project execution and a favorable business mix. The impact of inflation on input costs was more than offset by the impact of successful pricing actions taken in 2022, especially in the short-cycle business. The increase in income from operations is also impacted by gains from sales of businesses of $26 million while 2022 included significant costs in connection with the spin-off of the Turbocharging Division. Changes in foreign currencies, including the effect from changes in the FX/commodity timing differences summarized in the table below, positively impacted income from operations by approximately 2 percent.

Operational EBITA

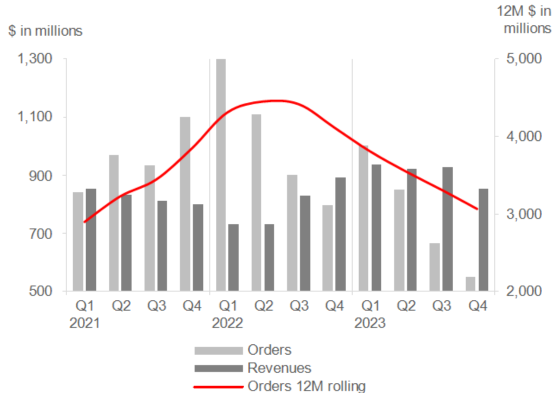
The reconciliation of Income from operations to Operational EBITA for the Process Automation Business area was as follows:

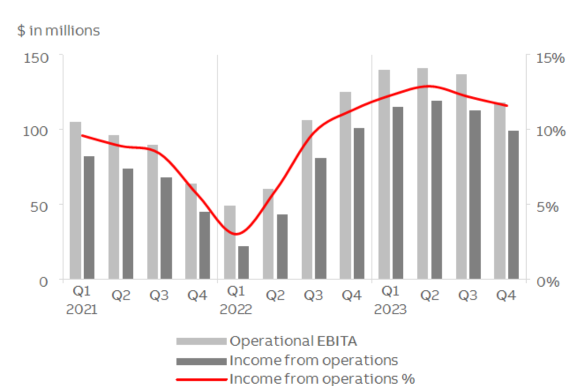
($ in millions)	2023	2022	2021
Income from operations	**947**	**663**	**713**
Acquisition-related amortization	5	4	5
Restructuring, related and implementation costs	3	29	48
Gains and losses from sale of businesses	(26)	—	(13)
Acquisition- and divestment-related expenses and integration costs	(7)	134	35
Certain other non-operational items	—	—	1
FX/commodity timing differences in income from operations	(13)	18	12
Operational EBITA	**909**	**848**	**801**

In 2023, Operational EBITA increased 7 percent (8 percent excluding the impact from changes in foreign currency exchange rates) compared to 2022, primarily due to the reasons described under "Income from operations", excluding the explanations related to the reconciling items in the table above.

Robotics & Discrete Automation Business area

The financial results of our Robotics & Discrete Automation Business area were as follows:





($ in millions)	2023	2022	2021	% Change 2023	% Change 2022
Orders	3,066	4,116	3,844	(26)%	7%
Order backlog at December 31,	2,141	2,679	1,919	(20)%	40%
Revenues	3,640	3,181	3,297	14%	(4)%
Income from operations	446	247	269	81%	(8)%
Operational EBITA	536	340	355	58%	(4)%

Orders

In 2023, orders decreased 26 percent (25 percent in local currencies) as customers normalized order patterns and the market in China softened. In the Machine Automation Division, the shortening of delivery lead times and easing of supply chain constraints led to customers normalizing order patterns, as the previous year saw customers placing orders early in an effort to secure deliveries. In the Robotics Division, lower orders were driven by the weakness in the underlying market in China with additional pressure from local inventory reductions among channel partners, apart from the automotive segment.

The geographic distribution of orders for our Robotics & Discrete Automation Business area was as follows:

($ in millions)	2023	2022	2021
Europe	1,481	2,043	1,978
The Americas	544	609	530
of which: United States	335	404	371
Asia, Middle East and Africa	1,041	1,464	1,336
of which: China	752	1,151	976
Total	**3,066**	**4,116**	**3,844**

In 2023, orders decreased in all regions. Orders in Europe decreased 28 percent (28 percent in local currencies) driven by decreased demand, mainly in Germany, Italy, France and Austria. Orders in the Americas decreased 11 percent (12 percent in local currencies) compared to 2022, driven by the normalization of orders in the U.S. due to shortened delivery lead times. Orders in Asia, Middle East and Africa decreased 29 percent (25 percent in local currencies) with lower demand in China, primarily in the Robotics Division.

Order backlog

In 2023, order backlog decreased 20 percent (20 percent in local currencies) compared to 2022. Order backlog decreased in both divisions due primarily to lower order intake, along with improved order backlog execution.

Revenues

In 2023, revenues increased 14 percent (14 percent in local currencies) compared to 2022. Revenues increased in both divisions due to improved order backlog execution, higher volumes from book-and-bill business and the realization of the impacts of successful price increases. Service revenues also increased in 2023, driven by strong demand from the automotive segment. The higher revenues in 2023 also reflects the impacts of the COVID-19 shutdown of the robotics factory in China during April 2022.

The geographic distribution of revenues for our Robotics & Discrete Automation Business area was as follows:

($ in millions)	2023	2022	2021
Europe	1,942	1,498	1,582
The Americas	577	525	441
of which: United States	361	374	309
Asia, Middle East and Africa	1,121	1,158	1,274
of which: China	805	899	950
Total	**3,640**	**3,181**	**3,297**

Revenues from Asia, Middle East and Africa decreased 3 percent (increased 1 percent in local currencies) compared to 2022 due to improved order backlog execution. Revenues in Europe increased 30 percent (27 percent in local currencies) with strong deliveries to Germany, Italy and France. In the Americas, revenues increased 10 percent (8 percent in local currencies) due to improved order backlog execution in Mexico and Canada.

Income from operations

In 2023, the Business area recorded income from operations of $446 million compared to $247 million in 2022, with both divisions contributing to the higher income level. The operational performance in 2023 reflected improved sales volumes, price increases, a favorable change in the revenue mix, and the benefit of cost reduction measures put in place in the second half of 2022. These positive drivers were partially offset by inflationary cost pressures in 2023 as well as some under absorption of fixed costs in the Robotics Division as demand softened towards the second half of the year. Changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, negatively impacted income from operations by approximately 1 percent.

Operational EBITA

The reconciliation of Income (loss) from operations to Operational EBITA for the Robotics & Discrete Automation Business area was as follows:

($ in millions)	2023	2022	2021
Income from operations	**446**	**247**	**269**
Acquisition-related amortization	79	78	83
Restructuring, related and implementation costs	6	11	7
Acquisition- and divestment-related expenses and integration costs	14	6	1
Certain other non-operational items	(10)	(8)	—
FX/commodity timing differences in income from operations	1	6	(5)
Operational EBITA	**536**	**340**	**355**

In 2023, Operational EBITA increased 58 percent (increased 60 percent excluding the impact from changes in foreign currency exchange rates) compared to 2022, primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

Corporate and Other

Net loss from operations for Corporate and Other was as follows:

($ in millions)	2023	2022	2021
Corporate headquarters and stewardship	(557)	(430)	(399)
Other corporate costs	(18)	(25)	(29)
Loss from equity-accounted companies	(6)	(101)	(102)
Fair value adjustment on equity securities	(2)	(4)	94
Regulatory penalty in connection with Kusile project	—	(313)	—
Net gain (loss) from sale of businesses[1]	—	43	(3)
Corporate brand income from Hitachi Energy	39	57	89
Corporate real estate	103	66	41
E-mobility Division	(234)	19	14
Divested businesses and other non-core activities	(37)	(117)	(72)
Total Corporate and Other	**(712)**	**(805)**	**(367)**

(1) 2022 includes gain on sale of the remaining 19.9 percent investment in Hitachi Energy Ltd.

In 2023, the net loss from operations within Corporate and Other decreased by $93 million to $712 million compared to 2022. This decrease was primarily driven by the impact of certain charges incurred in 2022 including the regulatory penalties in connection with the Kusile project and the loss from equity-accounted companies recorded for our investment in Hitachi Energy, which was sold in December 2022, partially offset by the net loss from operations in the E-mobility Division in 2023.

Corporate

In 2023, Corporate headquarters and stewardship costs increased by $127 million, mainly due to higher external consulting costs for system implementations and related process design, as well as higher costs in 2023 for employee short-term incentive compensation.

Corporate brand income results from granting the use of the ABB Brand to Hitachi Energy, the fair value of which was initially determined on the date of the divestment of the former Power Grids business in 2020. A portion of the proceeds received for the sale was allocated to the fair value of the granting of the use of the brand and is being amortized over the expected period of benefit received by Hitachi Energy.

Corporate real estate primarily includes income and expenses from property rentals and gains from the sale of real estate properties. In 2023, income from operations in corporate real estate included gains from the sale of real estate properties of approximately $102 million compared to $73 million in 2022.

Other corporate costs consists of operational costs of Corporate Treasury and other minor items.

Other - E-mobility

Commencing in 2023, the E-mobility Division became an independent Division and separate operating segment within ABB. Previously, the Division was managed in the Electrification Business area. In connection with this change, the results of the Division for all periods are reported within Corporate and Other as the Division does not meet any of the size thresholds in any period to be considered a reportable segment.

In 2023, the E-mobility Division reported a net loss from operations of $234 million compared to income from operations of $19 million in 2022. The loss in 2023 was impacted by combined charges in connection with excess and obsolete components and unfavorable inventory purchase commitments of $70 million, restructuring, related and implementation costs of $27 million and higher costs for system implementations and related process design. The amount in 2023 also reflects higher personnel costs as the Division continues its growth strategy as the revenues within the Division grew 33 percent. The change compared to 2022 also reflects $54 million of gains recorded in 2022 for net fair value gains on investments.

The E-mobility Division experienced revenue growth of 89 percent from 2021 to 2022. The income from operations in 2022 included the fair value gains as described above, while in 2021 it included $17 million of fair value gains. The Division also experienced increases in administrative costs in 2022 as it expanded its cost base in anticipation of significant revenue growth.

Other - Divested businesses and other non-core activities

The results of operations for certain divested businesses and other non-core activities are presented in Corporate and Other. Divested businesses include the high-voltage cables business, steel structures business and the oil & gas EPC business. Other continuing non-core activities include the execution and wind-down of certain legacy EPC and other contracts.

In 2023 and 2022, the amounts represent charges and losses relating to divested businesses and the winding down of the remaining EPC projects. We recorded losses of $37 million in 2023, down significantly from 2022, in which we recorded a restructuring expense of $195 million in connection with the exit of the full train retrofit business primarily for contract settlement costs, partially offset by the reversal of a provision of $61 million that we had previously recorded related to one of our divested businesses based on a settlement proposal issued by the ruling court.

At December 31, 2023, our remaining non-core activities primarily include the completion of the remaining EPC contracts for substations and oil & gas.

Liquidity and capital resources

Principal sources of funding

We meet our liquidity needs principally using cash from operations, proceeds from the issuance of debt instruments (bonds and commercial paper), and short-term bank borrowings. In 2023, we also received funds from the sale of our Power Conversion Division.

Our net debt is shown in the table below:

December 31, ($ in millions)	2023	2022
Short-term debt and current maturities of long-term debt	2,607	2,535
Long-term debt	5,221	5,143
Cash and equivalents	(3,891)	(4,156)
Restricted cash - current	(18)	(18)
Marketable securities and short-term investments	(1,928)	(725)
Net debt (defined as the sum of the above lines)	**1,991**	**2,779**

During 2023, although we continued to return high amounts of cash to shareholders in the form of dividends and purchases of treasury stock, we significantly increased cash from operating activities, resulting in a decrease in net debt, as presented in the table above.

During 2023, our net debt decreased $788 million to a net debt position of $1,991 million at December 31, 2023. The effect of exchange rate movements increased net debt by approximately $433 million. In 2023, we received net proceeds of $553 million for the sales of businesses. We generated cash flows from operating activities during 2023 of $4,290 million and sold treasury stock in relation to our employee share plans for $154 million. We also issued shares in our subsidiary ABB E-Mobility to third parties in private placements for $328 million. These items were mostly offset by amounts for purchases of treasury shares of $1,258 million, including $909 million relating to the announced buybacks of our shares, as well as $1,713 million for the payment of the dividend to our shareholders. We made net purchases of property, plant and equipment and intangible assets of $623 million and made payments of dividends to noncontrolling shareholders totaling $93 million. See "Financial position", "Investing activities" and "Financing activities" for further details.

Our Corporate Treasury is responsible for providing a range of treasury management services to our Group companies, including investing cash in excess of current business requirements. At December 31, 2023 and 2022, the proportion of our aggregate "Cash and equivalents" (including restricted cash) and "Marketable securities and short-term investments" managed by Corporate Treasury amounted to approximately 59 percent and 51 percent, respectively.

Our investment strategy for cash (in excess of current business requirements) has generally been to invest in short-term time deposits with maturities of less than 3 months, supplemented at times by investments in money market funds and in some cases, government securities. We actively monitor credit risk in our investment and derivative portfolios. Credit risk exposures are controlled in accordance with policies approved by our senior management to identify, measure, monitor and control credit risks. We have minimum rating requirements for our counterparts and closely monitor developments in the credit markets making appropriate changes to our investment policy as deemed necessary. In addition to minimum rating criteria, we have strict investment parameters and specific approved instruments as well as restrictions on the types of investments we make. These parameters are closely monitored on an ongoing basis and amended as we consider necessary.

Our cash is held in various currencies around the world. Approximately 51 percent of our cash and equivalents held at December 31, 2023, was in U.S. dollars, while the most significant foreign currencies in which cash and equivalents was held was euros (15 percent) and Chinese Renminbi (5 percent).

We believe the ongoing cash flows generated from our business, supplemented, when necessary, through access to the capital markets (including short-term commercial paper) and our credit facilities are sufficient to support business operations, capital expenditures, business acquisitions, the payment of dividends to shareholders and contributions to pension plans. Consequently, we believe that our ability to obtain funding from these sources will continue to provide the cash flows necessary to satisfy our working capital and capital expenditure requirements, as well as meet our debt repayments and other financial commitments for the next 12 months. See "Contractual obligations and commitments".

Due to the nature of our operations, including the timing of annual incentive payments to employees, our cash flow from operations generally tends to be weaker in the first half of the year than in the second half of the year.

Debt and interest rates

Total outstanding debt was as follows:

December 31, ($ in millions)	2023	2022
Short-term debt and current maturities of long-term debt	2,607	2,535
Long-term debt:		
Bonds	5,051	4,944
Other long-term debt	170	199
Total debt	**7,828**	**7,678**

In 2023, while the reduction of commercial paper outstanding and the repayment of long-term debt due in 2023 offset the reclassifications to short-term of long-term debt due in 2024, movements in foreign exchange rates resulted in a small increase of short-term debt of 3 percent.

At December 31, 2023, Long-term debt was $78 million higher compared to the end of 2022. We issued five new instruments in 2023 which remain classified as Long-term debt at December 31, 2023 (CHF 325 million 1.965% Bonds due 2026, EUR 500 million 3.25% Instruments due 2027, CHF 150 million 1.9775% Bonds due 2028, EUR 750 million 3.375% Instruments due 2031, and CHF 275 million 2.1125% Bonds due 2033). This was more than offset by the reclassification to current of the EUR 700 million 0.625% Instruments due 2024, EUR 500 million floating rate Instruments due 2024, EUR 750 million 0.75% Instruments due 2024, and CHF 150 million 0.3% Bonds due 2024. Decreases in interest rates also resulted in an increase in our long-term debt of approximately $97 million due to the application of fair value hedge accounting on certain outstanding instruments.

Our debt has been obtained in a range of currencies and maturities and with various interest rate terms. For certain of our debt obligations, we use derivatives to manage the fixed interest rate exposure. For example, we use interest rate swaps and cross-currency interest rate swaps to effectively convert fixed rate debt into floating rate liabilities. After considering the effects of interest rate swaps and cross-currency interest rate swaps, at December 31, 2023, the effective average interest rate on our floating rate long-term debt (including current maturities) of $2,907 million and our fixed rate long-term debt (including current maturities) of $4,834 million was 4.8 percent and 2.7 percent, respectively. This compares with an effective rate of 2.8 percent for floating rate long-term debt of $3,459 million and 2.2 percent for fixed rate long-term debt of $2,771 million at December 31, 2022.

For a discussion of our use of derivatives to modify the interest characteristics of certain of our individual bond issuances, see “Note 12 - Debt” to our Consolidated Financial Statements.

Credit facility

In December 2019, we replaced our previous multicurrency revolving credit facility with a new $2 billion multicurrency revolving credit facility, maturing in 2024. In 2021 we exercised our option to extend the maturity of this facility to 2026. No amount was drawn under the facility at December 31, 2023 and 2022. The facility is available for general corporate purposes and contains cross-default clauses whereby an event of default would occur if we were to default on indebtedness, as defined in the facility, at or above a specified threshold. In February 2023, we amended and restated our facility for the purpose of addressing the discontinuation of LIBOR. Under the amended and restated credit facility, the margin is unchanged, but advances in USD are referenced to CME Term SOFR, whilst advances in CHF and GBP are referenced to overnight SARON and SONIA, respectively, and subject to applicable credit adjustment spreads.

The credit facility does not contain financial covenants that would restrict our ability to pay dividends or raise additional funds in the capital markets. For further details of the credit facility, see “Note 12 - Debt” to our Consolidated Financial Statements.

Commercial paper

At December 31, 2023, we had two commercial paper programs in place:

- a $2 billion commercial paper program for the private placement of U.S. dollar denominated commercial paper in the United States, and
- a $2 billion Euro-commercial paper program for the issuance of commercial paper in a variety of currencies.

At December 31, 2023 and 2022, there were no amounts outstanding under the $2 billion program in the United States.

At December 31, 2023, there was no amount outstanding under the $2 billion Euro-commercial paper program while at December 31, 2022, there was $1,383 million outstanding.

European program for the issuance of debt

The European program for the issuance of debt allows the issuance of up to the equivalent of $8 billion in certain debt instruments. The terms of the program do not obligate any third party to extend credit to us and the terms and possibility of issuing any debt under the program are determined with respect to, and as of the date of issuance of, each debt instrument. At December 31, 2023, six bonds (principal amount of EUR 700 million due in 2024, principal amount of EUR 500 million due in 2024, principal amount of EUR 750 million due in 2024, principal amount of EUR 500 million due in 2027, principal amount of EUR 800 million due in 2030, and principal amount of EUR 750 million due in 2031) having a combined carrying amount of $4,259 million were outstanding under the program. The carrying amount of the five bonds outstanding under the program at December 31, 2022, was $3,444 million.

Credit ratings

Credit ratings are assessments by the rating agencies of the credit risk associated with ABB and are based on information provided by us or other sources that the rating agencies consider reliable. Higher ratings generally result in lower borrowing costs and increased access to capital markets. Our ratings are of “investment grade” which is defined as Baa3 (or above) from Moody’s and BBB− (or above) from Standard & Poor’s.

At December 31, 2023 and 2022, our long-term debt was rated A3 by Moody’s and with a Stable outlook. At December 31, 2023 and 2022, our long-term debt was rated A- by Standard & Poor’s and with a Stable outlook.

Limitations on transfers of funds

Currency and other local regulatory limitations related to the transfer of funds exist in a number of countries where we operate or otherwise have bank deposits, including: Argentina, Egypt, India, Indonesia, Malaysia, the Russian Federation, South Africa, South Korea, Thailand, Turkiye and Vietnam. Funds, other than regular dividends, fees or loan repayments, cannot be readily transferred offshore from these countries and are therefore deposited and used for working capital needs in those countries. In addition, there are certain countries where, for tax reasons, it is not considered optimal to transfer the cash offshore. Consequently, these funds are not available within Corporate Treasury to meet short-term cash obligations outside the relevant country. The above-described funds are reported as cash in our Consolidated Balance Sheets, but we do not consider these funds immediately available for the repayment of debt outside the respective countries where the cash is situated, including those described above. At December 31, 2023 and 2022, the balance of “Cash and equivalents” and “Marketable securities and other short-term investments” under such limitations (either regulatory or sub-optimal from a tax perspective) totaled $1,479 million and $1,381 million, respectively.

During 2023, we continued to direct our subsidiaries in countries with restrictions to place such cash with our core banks or investment grade banks, where possible, in order to minimize credit risk on such cash positions. We continue to closely monitor the situation to ensure bank counterparty risks are minimized.

Financial position

Balance sheets

December 31, ($ in millions)	2023	2022	% Change
Current assets			
Cash and equivalents	3,891	4,156	(6)%
Restricted cash	18	18	0%
Marketable securities and short-term investments	1,928	725	166%
Receivables, net	7,446	6,858	9%
Contract assets	1,090	954	14%
Inventories, net	6,149	6,028	2%
Prepaid expenses	235	230	2%
Other current assets	520	601	(13)%
Total current assets	**21,277**	**19,570**	**9%**

For a discussion on Cash and equivalents, see sections “Liquidity and Capital Resources—Principal sources of funding” and “Cash flows” for further details.

Marketable securities and short-term investments increased in 2023. The change primarily reflects higher amounts placed in bank time deposits and an increase in amounts placed in money market funds classified as equity securities (see “Note 5 - Cash and equivalents, marketable securities and short-term investments” to our Consolidated Financial Statements).

Receivables, net, increased 9 percent (7 percent in local currencies) reflecting the higher revenues in all Business areas primarily a result of higher business in 2023 compared to 2022.

Contract assets increased 14 percent (12 percent in local currencies) due to the higher level of business activity in all Business areas as well as timing of invoices issued. The increase is primarily driven by the Process Automation Business area.

Inventories, net, increased 2 percent primarily due to movements in foreign currencies. In local currency, Inventories, net, decreased 1 percent, reflecting a net decrease from acquisitions and divestments of approximately 1 percent. Inventory was stable on increased business volumes as the previous year included some stockpiling of certain key components due to supply chain challenges.

December 31, ($ in millions)	2023	2022	% Change
Current liabilities			
Accounts payable, trade	4,847	4,904	(1)%
Contract liabilities	2,844	2,216	28%
Short-term debt and current maturities of long-term debt	2,607	2,535	3%
Current operating leases	249	220	13%
Provisions for warranties	1,210	1,028	18%
Other provisions	1,201	1,171	3%
Other current liabilities	5,046	4,455	13%
Total current liabilities	**18,004**	**16,529**	**9%**

Accounts payable, trade, decreased 1 percent (3 percent in local currencies) reflecting some decrease in average days payable in 2023 compared to 2022.

Contract liabilities increased 28 percent (27 percent in local currency) primarily due to higher levels of progress billings and advances at the end of 2023 compared to 2022. The increase reflects higher levels in all Business areas except for Robotics & Discrete Automation.

The increase in short-term debt and current maturities of long-term debt in 2023 reflects the reclassification to current of the EUR 700 million 0.625% Instruments due 2024, EUR 500 million Floating Rate Instruments due 2024, EUR 750 million 0.75% Instruments due 2024 and the CHF 280 million 0.3% Bonds due 2024, offset by the repayment at maturity of the EUR 700 million 0.625% Instruments due 2023 and the CHF 275 million 0% Bonds due 2023 as well as by the full repayment of commercial paper borrowings under the Euro-commercial program in 2023. Movements in foreign currency rates increased short-term debt by 6 percent.

Current operating leases includes the portion of the operating lease liabilities that are due to be paid in the next 12 months. For a summary of operating lease liabilities, see “Note 14 - Leases” to our Consolidated Financial Statements.

Provisions for warranties increased 18 percent (15 percent in local currencies). The increase reflects the higher provisioning in 2023 on increased revenues as well as increases in expected costs for certain newer product lines. For details on the change in the Provisions for warranties, see “Note 15 - Commitments and contingencies” to our Consolidated Financial Statements.

December 31, ($ in millions)	**2023**	**2022**	**% Change**
Non-current assets			
Property, plant and equipment, net	4,142	3,911	6%
Operating lease right-of-use assets	893	841	6%
Investments in equity-accounted companies	187	130	44%
Prepaid pension and other employee benefits	780	916	(15)%
Intangible assets, net	1,223	1,406	(13)%
Goodwill	10,561	10,511	0%
Deferred taxes	1,381	1,396	(1)%
Other non-current assets	496	467	6%
Total non-current assets	**19,663**	**19,578**	**0%**

In 2023, Property, plant and equipment, net, increased 6 percent (3 percent in local currencies) as capital expenditures exceeded the annual depreciation expense.

In 2023, Goodwill remained flat (flat in local currencies). While currency movements increased goodwill by 1 percent, the net impact of acquisitions and divestments mostly offset this movement.

Intangible assets, net, decreased 13 percent (15 percent in local currencies). The decrease primarily represents the amortization recorded during the year. While the divestment of the Power Conversion division decreased Intangible assets, net, by 5 percent this was mostly offset by other acquisitions in 2023. For additional information on goodwill and intangible assets see “Note 11 - Goodwill and intangible assets” to our Consolidated Financial Statements.

Prepaid pension and other employee benefits decreased 15 percent (22 percent in local currencies). For additional information on Pension and employee benefits see “Note 17 - Employee benefits” to our Consolidated Financial Statements.

In 2023, Deferred taxes decreased 1 percent (4 percent in local currencies). For details on deferred tax assets see “Note 16 - Income taxes” to our Consolidated Financial Statements.

December 31, ($ in millions)	**2023**	**2022**	**% Change**
Non-current liabilities			
Long-term debt	5,221	5,143	2%
Non-current operating leases	666	651	2%
Pension and other employee benefits	686	719	(5)%
Deferred taxes	669	729	(8)%
Other non-current liabilities	1,548	2,105	(26)%
Total non-current liabilities	**8,790**	**9,347**	**(6)%**

Long-term debt increased 2 percent (decreased 3 percent in local currencies). The balance at December 31, 2023, includes five instruments newly issued in 2023: (i) CHF 325 million 1.965% Bonds due 2026, (ii) EUR 500 million 3.25% Instruments due 2027, (iii) CHF 150 million 1.9775% Bonds due 2028, (iv) EUR 750 million 3.375% Instruments due 2031 and (v) CHF 275 million 2.1125% Bonds due 2033. The increase was more than offset by the reclassification to current of the EUR 700 million 0.625% Instruments due 2024, EUR 500 million Floating Rate Instruments due 2024, EUR 750 million 0.75% Instruments due 2024 and CHF 280 million 0.3% Bonds due 2024. For additional information on Long-term debt, see "Liquidity and Capital Resources—Debt and interest rates" as well as "Note 12 - Debt" to our Consolidated Financial Statements.

Non-current operating leases includes the portion of the operating lease liabilities that are due to be paid in more than 12 months.

Pension and employee benefits decreased 5 percent (6 percent in local currencies). For additional information on Pension and employee benefits see "Note 17 - Employee benefits" to our Consolidated Financial Statements.

For a breakdown of Other non-current liabilities, see "Note 13 - Other provisions, other current liabilities and other non-current liabilities" to our Consolidated Financial Statements.

Cash flows

The Consolidated Statements of Cash Flows are shown on a continuing operations basis, with the effects of discontinued operations shown in aggregate for each major cash flow activity and also include the impact from changes in restricted cash.

The Consolidated Statements of Cash Flows can be summarized as follows:

($ in millions)	2023	2022	2021
Net cash provided by operating activities	4,290	1,287	3,330
Net cash provided by (used in) investing activities	(1,615)	981	2,307
Net cash used in financing activities	(2,897)	(2,394)	(4,968)
Effects of exchange rate changes on cash and equivalents	(43)	(189)	(81)
Net change in cash and equivalents and restricted cash	**(265)**	**(315)**	**588**

Operating activities

($ in millions)	2023	2022	2021
Net income	3,824	2,594	4,650
Loss from discontinued operations, net of tax	24	43	80
Depreciation and amortization	780	814	893
Total adjustments to reconcile net income to net cash provided by operating activities (excluding depreciation and amortization)	(200)	(434)	(2,593)
Total changes in operating assets and liabilities	(127)	(1,683)	308
Net cash provided by operating activities — continuing operations	**4,301**	**1,334**	**3,338**
Net cash used in operating activities — discontinued operations	**(11)**	**(47)**	**(8)**

Cash flows from operating activities in continuing operations in 2023 provided net cash of $4,301 million, more than three times the amount reported in 2022. In 2023, we had significantly higher cash effective net income (i.e. net income from continuing operations adjusted for depreciation, amortization and other non-cash items) reflecting the increase in business volumes and operating margins. Lower cash flows in 2022 were also partially due to costs relating to business restructurings as well as costs for the spin-off of the Turbocharging Division and other business portfolio transactions. In 2022, the amount also includes payments of approximately $315 million in relation to regulatory penalties for the Kusile project.

Our cash flows in 2023 improved on stronger working capital management especially in the area of inventories which contributed more than $1 billion of improvements in cash flows with some additional modest improvements in the timing of collections of cash from customers. In 2023, we were able to keep our working capital steady even while realizing increasing business volumes and some inflation-driven cost and price changes. This compares to the increase in working capital in 2022 which was driven by the significant buildup of inventories. In 2023 and 2022, there were no significant cash flows from operating activities of discontinued operations.

Investing activities

($ in millions)	2023	2022	2021
Purchases of investments	(1,957)	(321)	(1,528)
Purchases of property, plant and equipment and intangible assets	(770)	(762)	(820)
Acquisition of businesses (net of cash acquired) and increases in cost- and equity-accounted companies	(225)	(288)	(241)
Proceeds from sales of investments	610	697	2,272
Proceeds from maturity of investments	149	73	81
Proceeds from sales of property, plant and equipment	147	127	93
Proceeds from sales of businesses (net of transaction costs and cash disposed) and cost- and equity-accounted companies	553	1,541	2,958
Net cash from settlement of foreign currency derivatives	(109)	(166)	(121)
Changes in loans receivable, net	3	320	(19)
Other investing activities	7	(14)	(4)
Net cash provided by (used in) investing activities — continuing operations	**(1,592)**	**1,207**	**2,671**
Net cash used in investing activities — discontinued operations	**(23)**	**(226)**	**(364)**

Net cash used in investing activities for continuing operations in 2023 was $1,592 million compared to $1,207 million provided by investing activities during 2022, a change of $2,799 million. This difference primarily represents changes in amounts invested in money market funds as well as other short-term investments as the significantly higher operating cash flows generated in 2023 resulted in higher investments made, especially at the end of the year. In 2023, net proceeds from sales of businesses was lower at $553 million, primarily representing the sale of our Power Conversion Division, while in 2022 we received net proceeds in connection with the sale of our remaining equity-method investment in Hitachi Energy of $1,552 million. In addition, during 2022, Changes in loans receivable, net, includes funds collected from a subsidiary of Accelleron in October 2022, related to a short-term intercompany loan granted in anticipation of the Turbocharging Division spin-off.

The following presents purchases of property, plant and equipment and intangible assets by significant asset category:

($ in millions)	2023	2022	2021
Construction in progress	532	540	479
Purchase of machinery and equipment	176	127	150
Purchase of land and buildings	11	26	158
Purchase of intangible assets	51	69	33
Purchases of property, plant and equipment and intangible assets	**770**	**762**	**820**

There were no significant acquisitions in 2023 while the amount in 2022 primarily reflects the amount paid to acquire In-Charge.

Cash flows used in investing activities for discontinued operations includes amounts relating to the original sale of the Power Grids business to Hitachi in 2020. Certain amounts related to the purchase price were subject to adjustment, including the final settlement for working capital balances as well as other payments which were contractually due to be transferred to Hitachi in periods after the initial sale. In 2023 and 2022, payments totaling $23 million and $227 million, respectively, were made.

Financing activities

($ in millions)	2023	2022	2021
Net changes in debt with maturities of 90 days or less	(1,365)	1,366	(83)
Increase in debt	2,586	3,849	1,400
Repayment of debt	(1,567)	(2,703)	(1,538)
Delivery of shares	154	394	826
Purchase of treasury stock	(1,258)	(3,553)	(3,708)
Dividends paid	(1,713)	(1,698)	(1,726)
Cash associated with the spin-off of the Turbocharging Division	—	(172)	—
Dividends paid to noncontrolling shareholders	(93)	(99)	(98)
Proceeds from issuance of subsidiary shares	328	216	—
Other financing activities	31	6	(41)
Net cash used in financing activities — continuing operations	**(2,897)**	**(2,394)**	**(4,968)**
Net cash provided by financing activities — discontinued operations	**—**	**—**	**—**

Our financing cash flow activities primarily include debt transactions (both from the issuance of debt securities and borrowings directly from banks), share transactions (including share transactions in consolidated subsidiaries) and payments of distributions to controlling and noncontrolling shareholders.

In 2023, the net outflow for debt with maturities of 90 days or less related to net repayments of amounts outstanding under the Euro-commercial paper program and various local country borrowings.

In 2023, "Increase in debt" primarily represents initial borrowings for terms longer than 90 days under the Euro-commercial paper program of $400 million and borrowings under the following five long-term debt transactions (total cashflow amount at date of borrowings of approximately $2,170 million):

- CHF 325 million 1.965% Bonds due 2026
- EUR 500 million 3.25% Instruments due 2027
- CHF 150 million 1.9775% Bonds due 2028
- EUR 750 million 3.375% Instruments due 2031
- CHF 275 million 2.1125% Bonds due 2033

In 2023, "Repayment of debt" includes the repayment at maturity of the EUR 700 million 0.625% Instruments and CHF 275 million 0% Bonds and repayments of $418 million under the Euro-commercial paper program for borrowings having terms longer than 90 days.

"Delivery of shares" in 2023 primarily reflects cash received from the exercise of options in connection with our Management Incentive Plan (resulting in a delivery of 6 million shares). All shares were delivered out of Treasury stock.

"Proceeds from issuance of subsidiary shares" in 2023 relates to the sale of shares by ABB E-mobility Holdings Ltd through a private placement of $328 million.

In 2023, "Purchase of treasury stock" reflects $909 million of cash payments to purchase 25 million of our own shares in connection with the announced share buyback programs. It also reflects $349 million paid to purchase 9 million shares on the open market during the year.

Contractual obligations and commitments

The contractual obligations presented in the table below represent our estimates of future payments under fixed contractual obligations and commitments. These amounts may differ from those reported in our Consolidated Balance Sheet at December 31, 2023. Changes in our business needs, cancellation provisions and changes in interest rates, as well as actions by third parties and other factors, may cause these estimates to change. Therefore, our actual payments in future periods may vary from those presented below. The table below summarizes certain of our cash requirements for known contractual obligations and principal and interest payments under our debt instruments and purchase obligations at December 31, 2023, and the timing thereof. For details of future operating and finance lease payments, see "Note 14 - Leases" to our Consolidated Financial Statements.

At December 31, 2023 ($ in millions)	Current	Non-current	Total
Long-term debt obligations	2,507	5,237	**7,744**
Interest payments related to long-term debt obligations	131	910	**1,041**
Purchase obligations	3,150	1,297	**4,447**
Total	**5,788**	**7,444**	**13,232**

In the table above, the "Long-term debt obligations" reflect the cash amounts to be repaid upon maturity of those debt obligations. The cash obligations above will differ from Long-term debt due to the impacts of fair value hedge accounting adjustments and premiums or discounts on certain debt.

We have determined the interest payments related to long-term debt obligations by reference to the payments due under the terms of our debt obligations at the time such obligations were incurred. However, we use interest rate swaps to modify the interest characteristics of certain of our debt obligations. The net effect of these swaps may increase or decrease the actual amount of our cash interest payment obligations, which may differ from those stated in the above table. For further details on our debt obligations and the related hedges, see "Note 12 - Debt" to our Consolidated Financial Statements.

Purchase obligations are defined as agreements to purchase goods and services that are enforceable and legally binding, that specify all significant terms, including the quantities to be purchased, price provisions and the approximate timing of the transactions. Purchase obligations includes procurement contracts for raw materials, sub-contracted work, supplies and services. Purchase obligations include amounts recorded as well as amounts that are not recorded in the Consolidated Balance Sheets.

Off-balance sheet arrangements

Commercial commitments

We disclose the maximum potential exposure of certain guarantees, as well as possible recourse provisions that may allow us to recover from third parties amounts paid out under such guarantees. The maximum potential exposure does not allow any discounting of our assessment of actual exposure under the guarantees. The information below reflects our maximum potential exposure under the guarantees, which is higher than our assessment of the expected exposure.

Guarantees

The following table provides quantitative data regarding our third-party guarantees. The maximum potential payments represent a worst-case scenario, and do not reflect our expected outcomes.

	Maximum potential payments	
December 31, ($ in millions)	**2023**	**2022**
Performance guarantees	3,451	4,300
Financial guarantees	94	96
Total	**3,545**	**4,396**

The carrying amount of liabilities recorded in the Consolidated Balance Sheets reflects our best estimate of future payments, which we may incur as part of fulfilling our guarantee obligations. In respect of the above guarantees, the carrying amounts of liabilities at December 31, 2023 and 2022, were not significant.

In addition, in the normal course of bidding for and executing certain projects, we have entered into standby letters of credit, bid/performance bonds and surety bonds (collectively “performance bonds”) with various financial institutions. Customers can draw on such performance bonds in the event that we do not fulfill our contractual obligations. We would then have an obligation to reimburse the financial institution for amounts paid under the performance bonds. At December 31, 2023 and 2022, the total outstanding performance bonds aggregated to $3.1 billion and $2.9 billion, respectively. There have been no significant amounts reimbursed to financial institutions under these types of arrangements in 2023 and 2022.

For additional descriptions of our performance, financial and indemnification guarantees see “Note 15 - Commitments and contingencies” to our Consolidated Financial Statements.

02 Consolidated Financial Statements

CONSOLIDATED FINANCIAL STATEMENTS OF ABB GROUP

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Report of management on internal control over financial reporting

The Board of Directors and Management of ABB Ltd and its consolidated subsidiaries ("ABB") are responsible for establishing and maintaining adequate internal control over financial reporting. ABB's internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation and fair presentation of the published Consolidated Financial Statements in accordance with U.S. generally accepted accounting principles.

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

Management conducted an assessment of the effectiveness of internal control over financial reporting based on the criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on this assessment, management has concluded that ABB's internal control over financial reporting was effective as of December 31, 2023.

KPMG AG, the independent registered public accounting firm who audited the Company's consolidated financial statements, has issued an opinion on the effectiveness of ABB's internal control over financial reporting as of December 31, 2023, which is included on page 62 of this Annual Report.

Björn Rosengren
Chief Executive Officer

Timo Ihamuotila
Chief Financial Officer

Zurich, February 22, 2024

Statutory Auditor’s Report

To the General Meeting of ABB Ltd, Zurich

Report on the Audit of the Consolidated Financial Statements

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of ABB Ltd and subsidiaries (the Group) as of December 31, 2023 and 2022, the related consolidated income statements, consolidated statements of comprehensive income, consolidated statements of cash flows, and consolidated statements of changes in stockholders’ equity for each of the years in the three-year period ended December 31, 2023, and the related notes to the consolidated financial statements (collectively, the consolidated financial statements on page 64 to124, including a summary of significant accounting policies. In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Group as of December 31, 2023 and 2022, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2023, in conformity with U.S. generally accepted accounting principles (US GAAP) and comply with Swiss law.

Basis for Opinion

We conducted our audit in accordance with Swiss law, Swiss Standards on Auditing (SA-CH) and the standards of the Public Company Accounting Oversight Board (United States) (PCAOB). Our responsibility is to express an opinion on these consolidated financial statements based on our audit and our responsibilities under those provisions and standards are further described in the “Auditor’s Responsibilities for the Audit of the Consolidated Financial Statements” section of our report. We are a public accounting firm and are independent of the Group in accordance with the provisions of Swiss law and U.S. federal securities laws, together with the requirements of the Swiss audit profession, the U.S. Securities and Exchange Commission and the PCAOB, and we have fulfilled our other ethical responsibilities in accordance with these requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a 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.

Revenue recognition for certain long-term fixed price contracts using the percentage-of-completion method

Critical Audit Matter

As discussed in Note 2 to the consolidated financial statements, revenues from the sale of customized products, including long-term fixed price contracts for integrated automation and electrification systems and solutions are generally recognized on an over time basis using the percentage-of-completion method of accounting. For the year ended December 31, 2023, the Group/Company reported $27,010 million of revenue from sales of products, a portion of which related to long-term fixed price contracts.

We identified the evaluation of estimated costs to complete related to revenue recognition of certain long-term fixed price contracts using the percentage of-completion method of accounting as a critical audit matter. In particular, a high degree of subjective auditor judgment was required to evaluate the Group's estimates regarding the amount of future direct materials, labor and subcontract costs, and indirect costs to complete the contracts.

Our response

The following are the primary procedures we performed to address this critical audit matter. We evaluated the design and tested the operating effectiveness of certain internal controls related to the Group's revenue process including controls over the development of estimates regarding the amount of future direct materials, labor and subcontract costs, and indirect costs. We assessed the Group's historical ability to accurately estimate costs to complete by comparing historical estimates to actual results for a selection of contracts. We evaluated the estimate of remaining costs to be incurred for a selection of contracts by assessing progress to date and the nature and complexity of work to be performed through interviewing project managers and inspecting correspondence, if any, between the Group and the customer and/or subcontractors.

For further information on revenue recognition for long-term fixed price contracts refer to the following:

- Note 2 “Significant accounting policies

Other Information in the ABB Annual Reporting Suite

The Board of Directors is responsible for the other information. The other information comprises the information included in the ABB Annual Reporting Suite (consisting of the Integrated Report, the Financial Report, the Corporate Governance Report, and the Compensation Report), but does not include the consolidated financial statements, the stand-alone financial statements of the company, the compensation report and our auditor's reports thereon.

Our opinion on the consolidated financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the consolidated financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the consolidated financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated.

If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of the Board of Directors for the Consolidated Financial Statements

The Board of Directors is responsible for the preparation and fair presentation of consolidated financial statements in accordance with US GAAP and the provisions of Swiss law, and for such internal control as the Board of Directors determines is necessary to enable the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the Board of Directors is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Board of Directors either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

Auditor's Responsibilities for the Audit of the Consolidation Financial Statements

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

As part of an audit in accordance with Swiss law, SA-CH and PCAOB standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made.
- Conclude on the appropriateness of the Board of Directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the Group audit. We remain solely responsible for our audit opinion.

We communicate with the Board of Directors and the Audit Committee regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies or material weaknesses in internal control that we identify during our audit.

We also provide the Board of Directors and the Audit Committee with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, actions taken to eliminate threats or safeguards applied.

From the matters arising from the audit of the financial statements that were communicated or required to be communicated to the Board of Directors and the Audit Committee, we determine those matters that related to accounts or disclosures that are material to the financial statements and involved especially challenging, subjective, or complex auditor judgment in current period and are therefore critical audit matters.

Report on Other Legal and Regulatory Requirement

In accordance with article 728a para. 1 item 3 CO and PS-CH 890, we confirm that an internal control system exists, which has been designed for the preparation of consolidated financial statements according to the instructions of the Board of Directors.

We recommend that the consolidated financial statements submitted to you be approved.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Group's internal control over financial reporting as of December 31, 2023, 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, 2024, expressed an unqualified opinion on the effectiveness of the Group's internal control over financial reporting.

We have served as the Group's auditor since 2018.

KPMG AG

Achim Wolper
Licensed Audit Expert
Auditor in Charge

Mohammad Nafeie

Zurich, Switzerland
February 22, 2024

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EXPERTsuisse Certified Company

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of ABB Ltd

Opinion on Internal Control Over Financial Reporting

We have audited ABB Ltd and subsidiaries' (the Group) internal control over financial reporting as of December 31, 2023, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Group maintained, in all material respects, effective internal control over financial reporting as of December 31, 2023, based on criteria established in Internal Control – Integrated Framework (2013) issued by COSO.

We also have audited, in accordance with the Swiss law, Swiss Standards on Auditing (SA-CH) and the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2023 and 2022, the related consolidated income statements, statements of comprehensive income, cash flows and changes in stockholders' equity for each of the years in the three-year period ended December 31, 2023, and the related notes (collectively, the consolidated financial statements), and our report dated February 22, 2024, expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's Board of Directors and management are 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 report of management 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.

KPMG AG

Achim Wolper
Licensed Audit Expert
Auditor in Charge

Mohammad Nafeie

Zurich, Switzerland
February 22, 2024

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EXPERTsuisse Certified Company

ABB Ltd Consolidated Income Statements

Year ended December 31 ($ in millions, except per share data in $)	2023	2022	2021
Sales of products	27,010	24,471	23,745
Sales of services and other	5,225	4,975	5,200
Total revenues	**32,235**	**29,446**	**28,945**
Cost of sales of products	(17,938)	(16,804)	(16,364)
Cost of services and other	(3,083)	(2,932)	(3,114)
Total cost of sales	**(21,021)**	**(19,736)**	**(19,478)**
Gross profit	**11,214**	**9,710**	**9,467**
Selling, general and administrative expenses	(5,543)	(5,132)	(5,162)
Non-order related research and development expenses	(1,317)	(1,166)	(1,219)
Other income (expense), net	517	(75)	2,632
Income from operations	**4,871**	**3,337**	**5,718**
Interest and dividend income	165	72	51
Interest and other finance expense	(275)	(130)	(148)
Non-operational pension (cost) credit	17	115	166
Income from continuing operations before taxes	**4,778**	**3,394**	**5,787**
Income tax expense	(930)	(757)	(1,057)
Income from continuing operations, net of tax	**3,848**	**2,637**	**4,730**
Loss from discontinued operations, net of tax	(24)	(43)	(80)
Net income	**3,824**	**2,594**	**4,650**
Net income attributable to noncontrolling interests and redeemable noncontrolling interests	(79)	(119)	(104)
Net income attributable to ABB	**3,745**	**2,475**	**4,546**
Amounts attributable to ABB shareholders:			
Income from continuing operations, net of tax	3,769	2,517	4,625
Loss from discontinued operations, net of tax	(24)	(42)	(79)
Net income	3,745	2,475	4,546
Basic earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	2.03	1.33	2.31
Loss from discontinued operations, net of tax	(0.01)	(0.02)	(0.04)
Net income	2.02	1.30	2.27
Diluted earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	2.02	1.32	2.29
Loss from discontinued operations, net of tax	(0.01)	(0.02)	(0.04)
Net income	2.01	1.30	2.25
Weighted-average number of shares outstanding (in millions) used to compute:			
Basic earnings per share attributable to ABB shareholders	1,855	1,899	2,001
Diluted earnings per share attributable to ABB shareholders	1,867	1,910	2,019

Due to rounding, numbers presented may not add to the totals provided.

See accompanying Notes to the Consolidated Financial Statements

ABB Ltd Consolidated Statements of Comprehensive Income

Year ended December 31 ($ in millions)	2023	2022	2021
Net income	**3,824**	**2,594**	**4,650**
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments:			
Foreign currency translation adjustments	(290)	(685)	(521)
Net loss on complete or substantially complete liquidations of foreign subsidiaries	—	5	—
Changes attributable to divestments	9	41	(9)
Foreign currency translation adjustments	**(281)**	**(639)**	**(530)**
Available-for-sale securities:			
Net unrealized gains (losses) arising during the year	5	(23)	(10)
Reclassification adjustments for net (gains) losses included in net income	6	2	(5)
Unrealized gains (losses) on available-for-sale securities	**11**	**(21)**	**(15)**
Pension and other postretirement plans:			
Prior service (costs) credits arising during the year	(1)	—	—
Net actuarial gains (losses) arising during the year	(282)	226	411
Amortization of prior service credit included in net income	(9)	(16)	(14)
Amortization of net actuarial loss included in net income	38	44	69
Net losses from settlements and curtailments included in net income	14	9	7
Changes attributable to divestments	3	(8)	(6)
Pension and other postretirement plan adjustments	**(237)**	**255**	**467**
Derivative instruments and hedges:			
Net unrealized gains (losses) arising during the year	(10)	(12)	8
Reclassification adjustments for net (gains) losses included in net income	8	12	(13)
Changes in derivative instruments and hedges	**(2)**	**—**	**(5)**
Total other comprehensive income (loss), net of tax	**(509)**	**(405)**	**(83)**
Total comprehensive income, net of tax	**3,315**	**2,189**	**4,567**
Total comprehensive (income) loss attributable to noncontrolling interests and redeemable noncontrolling interests, net of tax	(84)	(87)	(108)
Total comprehensive income attributable to ABB, net of tax	**3,231**	**2,102**	**4,459**

Due to rounding, numbers presented may not add to the totals provided.
See accompanying Notes to the Consolidated Financial Statements

ABB Ltd Consolidated Balance Sheets

December 31 ($ in millions, except share data)	2023	2022
Cash and equivalents	3,891	4,156
Restricted cash	18	18
Marketable securities and short-term investments	1,928	725
Receivables, net	7,446	6,858
Contract assets	1,090	954
Inventories, net	6,149	6,028
Prepaid expenses	235	230
Other current assets	520	601
Total current assets	**21,277**	**19,570**
Property, plant and equipment, net	4,142	3,911
Operating lease right-of-use assets	893	841
Investments in equity-accounted companies	187	130
Prepaid pension and other employee benefits	780	916
Intangible assets, net	1,223	1,406
Goodwill	10,561	10,511
Deferred taxes	1,381	1,396
Other non-current assets	496	467
Total assets	**40,940**	**39,148**
Accounts payable, trade	4,847	4,904
Contract liabilities	2,844	2,216
Short-term debt and current maturities of long-term debt	2,607	2,535
Current operating leases	249	220
Provisions for warranties	1,210	1,028
Other provisions	1,201	1,171
Other current liabilities	5,046	4,455
Total current liabilities	**18,004**	**16,529**
Long-term debt	5,221	5,143
Non-current operating leases	666	651
Pension and other employee benefits	686	719
Deferred taxes	669	729
Other non-current liabilities	1,548	2,105
Total liabilities	**26,794**	**25,876**
Commitments and contingencies		
Redeemable noncontrolling interest	89	85
Stockholders' equity:		
Common stock, CHF 0.12 par value (1,882 million and 1,965 million shares issued at December 31, 2023 and 2022, respectively)	163	171
Additional paid-in capital	7	141
Retained earnings	19,724	20,082
Accumulated other comprehensive loss	(5,070)	(4,556)
Treasury stock, at cost (40 million and 100 million shares at December 31, 2023 and 2022, respectively)	(1,414)	(3,061)
Total ABB stockholders' equity	**13,410**	**12,777**
Noncontrolling interests	647	410
Total stockholders' equity	**14,057**	**13,187**
Total liabilities and stockholders' equity	**40,940**	**39,148**

Due to rounding, numbers presented may not add to the totals provided.

See accompanying Notes to the Consolidated Financial Statements

ABB Ltd Consolidated Statements of Cash Flows

Year ended December 31 ($ in millions)	2023	2022	2021
Operating activities:			
Net income	3,824	2,594	4,650
Loss from discontinued operations, net of tax	24	43	80
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	780	814	893
Changes in fair values of investments	(29)	(33)	(123)
Pension and other employee benefits	(48)	(125)	(216)
Deferred taxes	(25)	(344)	(289)
Loss from equity-accounted companies	16	102	100
Net loss (gain) from derivatives and foreign exchange	(55)	(23)	49
Net gain from sale of property, plant and equipment	(116)	(84)	(38)
Net loss (gain) from sale of businesses	(101)	7	(2,193)
Other	158	66	117
Changes in operating assets and liabilities:			
Trade receivables, net	(661)	(831)	(142)
Contract assets and liabilities	412	416	29
Inventories, net	(3)	(1,599)	(771)
Accounts payable, trade	(106)	395	659
Accrued liabilities	254	136	454
Provisions, net	211	(70)	(48)
Income taxes payable and receivable	(190)	(94)	117
Other assets and liabilities, net	(44)	(36)	10
Net cash provided by operating activities — continuing operations	**4,301**	**1,334**	**3,338**
Net cash used in operating activities — discontinued operations	**(11)**	**(47)**	**(8)**
Net cash provided by operating activities	**4,290**	**1,287**	**3,330**
Investing activities:			
Purchases of investments	(1,957)	(321)	(1,528)
Purchases of property, plant and equipment and intangible assets	(770)	(762)	(820)
Acquisition of businesses (net of cash acquired) and increases in cost- and equity-accounted companies	(225)	(288)	(241)
Proceeds from sales of investments	610	697	2,272
Proceeds from maturity of investments	149	73	81
Proceeds from sales of property, plant and equipment	147	127	93
Proceeds from sales of businesses (net of transaction costs and cash disposed) and cost- and equity-accounted companies	553	1,541	2,958
Net cash from settlement of foreign currency derivatives	(109)	(166)	(121)
Changes in loans receivable, net	3	320	(19)
Other investing activities	7	(14)	(4)
Net cash provided by (used in) investing activities — continuing operations	**(1,592)**	**1,207**	**2,671**
Net cash used in investing activities — discontinued operations	**(23)**	**(226)**	**(364)**
Net cash provided by (used in) investing activities	**(1,615)**	**981**	**2,307**

Year ended December 31 ($ in millions)	2023	2022	2021
Financing activities:			
Net changes in debt with maturities of 90 days or less	(1,365)	1,366	(83)
Increase in debt	2,586	3,849	1,400
Repayment of debt	(1,567)	(2,703)	(1,538)
Delivery of shares	154	394	826
Purchase of treasury stock	(1,258)	(3,553)	(3,708)
Dividends paid	(1,713)	(1,698)	(1,726)
Cash associated with the spin-off of the Turbocharging Division	—	(172)	—
Dividends paid to noncontrolling shareholders	(93)	(99)	(98)
Proceeds from issuance of subsidiary shares	328	216	—
Other financing activities	31	6	(41)
Net cash used in financing activities — continuing operations	**(2,897)**	**(2,394)**	**(4,968)**
Net cash provided by financing activities — discontinued operations	**—**	**—**	**—**
Net cash used in financing activities	**(2,897)**	**(2,394)**	**(4,968)**
Effects of exchange rate changes on cash and equivalents and restricted cash	(43)	(189)	(81)
Net change in cash and equivalents and restricted cash	**(265)**	**(315)**	**588**
Cash and equivalents and restricted cash, beginning of period	4,174	4,489	3,901
Cash and equivalents and restricted cash, end of period	**3,909**	**4,174**	**4,489**
Supplementary disclosure of cash flow information:			
Interest paid	250	90	132
Income taxes paid	1,147	1,188	1,292

Due to rounding, numbers presented may not add to the totals provided.
See accompanying Notes to the Consolidated Financial Statements

ABB Ltd Consolidated Statements of Changes in Stockholders' Equity

Years ended December 31, 2023, 2022 and 2021 ($ in millions)	Common stock	Additional paid-in capital	Retained earnings	Accumulated other comprehensive loss	Treasury stock	Total ABB stockholders' equity	Non-controlling interests	Total stockholders' equity
Balance at January 1, 2021	**188**	**83**	**22,946**	**(4,002)**	**(3,530)**	**15,685**	**314**	**15,999**
Net income			4,546			4,546	104	4,650
Foreign currency translation adjustments, net of tax				(534)		(534)	4	(530)
Effect of change in fair value of available-for-sale securities, net of tax				(15)		(15)		(15)
Unrecognized income (expense) related to pensions and other postretirement plans, net of tax				467		467		467
Change in derivative instruments and hedges, net of tax				(5)		(5)		(5)
Changes in noncontrolling interests		(37)	(20)			(57)	55	(2)
Dividends to noncontrolling shareholders						—	(98)	(98)
Dividends to shareholders			(1,730)			(1,730)		(1,730)
Cancellation of treasury shares	(10)	(17)	(3,130)		3,157	—		—
Share-based payment arrangements		60				60		60
Purchase of treasury stock					(3,682)	(3,682)		(3,682)
Delivery of shares		(84)	(136)		1,046	826		826
Other		16				16		16
Balance at December 31, 2021	**178**	**22**	**22,477**	**(4,088)**	**(3,010)**	**15,579**	**378**	**15,957**
Net income[(1)]			2,475			2,475	124	2,599
Foreign currency translation adjustments, net of tax				(608)		(608)	(31)	(639)
Effect of change in fair value of available-for-sale securities, net of tax				(21)		(21)		(21)
Unrecognized income (expense) related to pensions and other postretirement plans, net of tax				256		256	(1)	255
Change in derivative instruments and hedges, net of tax				—		—		—
Issuance of subsidiary shares		120				120	86	206
Other changes in noncontrolling interests		10				10	(34)	(24)
Dividends to noncontrolling shareholders						—	(100)	(100)
Dividends to shareholders			(1,700)			(1,700)		(1,700)
Spin-off of the Turbocharging Division			(177)	(95)		(272)	(12)	(284)
Cancellation of treasury shares	(8)	(4)	(2,864)		2,876	—		—
Share-based payment arrangements		42				42		42
Purchase of treasury stock					(3,502)	(3,502)		(3,502)
Delivery of shares		(51)	(130)		575	394		394
Other		2				2		2
Balance at December 31, 2022	**171**	**141**	**20,082**	**(4,556)**	**(3,061)**	**12,777**	**410**	**13,187**
Net income[(1)]			3,745			3,745	83	3,828
Foreign currency translation adjustments, net of tax				(286)		(286)	5	(281)
Effect of change in fair value of available-for-sale securities, net of tax				11		11		11
Unrecognized income (expense) related to pensions and other postretirement plans, net of tax				(237)		(237)		(237)
Change in derivative instruments and hedges, net of tax				(2)		(2)		(2)
Issuance of subsidiary shares		170				170	168	338
Other changes in noncontrolling interests		(31)	(37)			(68)	67	(1)
Dividends to noncontrolling shareholders						—	(93)	(93)
Dividends to shareholders			(1,706)			(1,706)		(1,706)
Cancellation of treasury shares	(7)	(201)	(2,359)		2,567	—		—
Share-based payment arrangements		101				101	2	103
Purchase of treasury stock					(1,247)	(1,247)		(1,247)
Delivery of shares		(173)			327	154		154
Other		(2)				(2)	5	3
Balance at December 31, 2023	**163**	**7**	**19,724**	**(5,070)**	**(1,414)**	**13,410**	**647**	**14,057**

(1) Amounts attributable to noncontrolling interests in 2023 and 2022 exclude net losses of $4 million and $5 million, respectively, related to redeemable noncontrolling interests, which are reported in the mezzanine equity section on the Consolidated Balance Sheets. See Note 4 for details.

Due to rounding, numbers presented may not add to the totals provided.

See accompanying Notes to the Consolidated Financial Statements

Notes to the Consolidated Financial Statements

Note 1
The Company

ABB Ltd and its subsidiaries (collectively, the Company) together form a technology leader in electrification and automation, enabling a more sustainable and resource-efficient future. The Company's solutions connect engineering know-how and software to optimize how things are manufactured, moved, powered, and operated.

Note 2
Significant accounting policies

The following is a summary of significant accounting policies followed in the preparation of these Consolidated Financial Statements.

Basis of presentation

The Consolidated Financial Statements are prepared in accordance with United States of America (United States or U.S.) generally accepted accounting principles (U.S. GAAP) and are presented in United States dollars ($ or USD) unless otherwise stated. Due to rounding, numbers presented may not add to the totals provided. The par value of capital stock is denominated in Swiss francs.

Reclassifications

Certain amounts reported for prior years in the Consolidated Financial Statements and the accompanying Notes have been reclassified to conform to the current year's presentation. These changes relate primarily to the reorganization of the Company's operating segments (see Note 23 for details).

Scope of consolidation

The Consolidated Financial Statements include the accounts of ABB Ltd and companies which are directly or indirectly controlled by ABB Ltd. Additionally, the Company consolidates variable interest entities if it has determined that it is the primary beneficiary. Intercompany accounts and transactions are eliminated. Investments in joint ventures and affiliated companies in which the Company has the ability to exercise significant influence over operating and financial policies (generally through direct or indirect ownership of 20 percent to 50 percent of the voting rights and/or board of director representation), are recorded in the Consolidated Financial Statements using the equity method of accounting.

Translation of foreign currencies and foreign exchange transactions

The functional currency for most of the Company's subsidiaries is the applicable local currency. The translation from the applicable functional currencies into the Company's reporting currency is performed for balance sheet accounts using exchange rates in effect at the balance sheet date and for income statement accounts using average exchange rates prevailing during the year. The resulting translation adjustments are excluded from the determination of earnings and are recognized in Accumulated other comprehensive loss until the subsidiary is sold, substantially liquidated or evaluated for impairment in anticipation of disposal.

Foreign currency exchange gains and losses, such as those resulting from foreign currency denominated receivables or payables, are included in the determination of earnings, except as they relate to intercompany loans that are equity-like in nature with no reasonable expectation of repayment, which are recognized in Accumulated other comprehensive loss. Exchange gains and losses are recognized in earnings and classified in the line item consistent with the underlying transaction or item.

Discontinued operations

The Company reports a disposal, or planned disposal, of a component or a group of components as a discontinued operation if the disposal represents a strategic shift that has or will have a major effect on the Company's operations and financial results. A strategic shift could include a disposal of a major geographical area, a major line of business or other major parts of the Company. A component may be a reportable segment or an operating segment, a reporting unit, a subsidiary, or an asset group.

The assets and liabilities of a component reported as a discontinued operation are presented separately as held for sale and in discontinued operations in the Company's Consolidated Balance Sheets.

Interest expense that is not directly attributable to or related to the Company's continuing business or discontinued business is allocated to discontinued operations based on the ratio of net assets to be sold less debt that is required to be paid as a result of the planned disposal transaction to the sum of total net assets of the Company plus consolidated debt. General corporate overhead is not allocated to discontinued operations.

Operating cycle

For classification of certain current assets and liabilities, the Company has elected to use the duration of individual contracts as its operating cycle. Accordingly, there are contract assets and liabilities, accounts receivable, inventories and provisions related to these contracts which will not be realized within one year that have been classified as current. Long-term system integration activities comprise the majority of the Company's activities which have an operating cycle in excess of one year that have been classified as current.

Use of estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make assumptions and estimates that directly affect the amounts reported in the Consolidated Financial Statements and the accompanying Notes. These accounting assumptions and estimates include:

- estimates to determine valuation allowances for deferred tax assets and amounts recorded for unrecognized tax benefits,
- estimates related to credit losses expected to occur over the remaining life of financial assets such as trade and other receivables, loans and other instruments,
- estimates of loss contingencies associated with litigation or threatened litigation and other claims and inquiries, environmental damages, product warranties, self-insurance reserves, regulatory and other proceedings,
- assumptions and projections, principally related to future material, labor and project-related overhead costs, used in determining the percentage-of-completion on projects where revenue is recognized over time, as well as the amount of variable consideration the Company expects to be entitled to,
- assumptions used in the calculation of pension and postretirement benefits and the fair value of pension plan assets,
- estimates used to record expected costs for employee severance in connection with restructuring programs,
- assumptions used in determining inventory obsolescence and net realizable value,
- growth rates, discount rates and other assumptions used to determine impairment of long-lived assets and in testing goodwill for impairment,
- estimates and assumptions used in determining the fair values of assets and liabilities assumed in business combinations, and
- estimates and assumptions used in determining the initial fair value of retained noncontrolling interests and certain obligations in connection with divestments.

The actual results and outcomes may differ from the Company's estimates and assumptions.

Cash and equivalents

Cash and equivalents include highly liquid investments with maturities of three months or less at the date of acquisition.

Currency and other local regulatory limitations related to the transfer of funds exist in a number of countries where the Company operates. Funds, other than regular dividends, fees or loan repayments, cannot be readily transferred abroad from these countries and are therefore deposited and used for working capital needs locally. These funds are included in cash and equivalents as they are not considered restricted.

Cash and equivalents that are subject to contractual restrictions or other legal obligations and are not readily available are classified as “Restricted cash”.

Marketable securities and short-term investments

Management determines the appropriate classification of held-to-maturity and available-for-sale debt securities at the time of purchase. Debt securities are classified as held-to-maturity when the Company has the positive intent and ability to hold the securities to maturity. Held-to-maturity debt securities are carried at amortized cost, adjusted for accretion of discounts or amortization of premiums to maturity computed under the effective interest method. Such accretion or amortization is included in Interest and dividend income. Marketable debt securities not classified as held-to-maturity are classified as available-for-sale and reported at fair value.

Unrealized gains and losses on available-for-sale debt securities are excluded from the determination of earnings and are instead recognized in the Accumulated other comprehensive loss component of stockholders’ equity, net of tax, until realized. Realized gains and losses on available-for-sale debt securities are computed based upon the historical cost of these securities, using the specific identification method.

Marketable debt securities are classified as either “Cash and equivalents” or “Marketable securities and short-term investments” according to their maturity at the time of acquisition.

Marketable equity securities are generally classified as “Marketable securities and short-term investments”, however, any marketable securities held as a long-term investment rather than as an investment of excess liquidity are classified as “Other non-current assets”. Marketable equity securities are measured at fair value with fair value changes reported in net income. Fair value changes for marketable equity securities are generally reported in Interest and other finance expense, however, fair value changes for certain marketable equity securities classified as long-term investments are reported in Other income (expense), net.

For debt securities classified as available-for-sale where fair value has declined below amortized cost due to credit losses, the Company records an allowance for expected credit losses and adjusts the allowance in subsequent periods in Interest and other finance expense. All fair value changes other than those related to credit risk are reported in Accumulated other comprehensive loss until the security is sold.

In addition, equity securities without readily determinable fair values are remeasured if there is an observable price change in an orderly transaction for the same investment, or if a qualitative assessment indicates that the investment is impaired and the fair value of the investment is less than its carrying amount. Similar to other fair value changes as described above, depending on the nature of the investment, this fair value change is either recorded in Other income (expense), net or Interest and other finance expense.

Accounts receivable and allowance for expected credit losses

Accounts receivable are recorded at the invoiced amount. The Company has a group-wide policy on the management of credit risk. The policy includes a credit assessment methodology to assess the creditworthiness of customers and assign to those customers a risk category. Third-party agencies’ ratings are considered, if available. For customers where agency ratings are not available, the customer’s most recent financial statements, payment history and other relevant information are considered in the assignment to a risk category. Customers are assessed at least annually or more frequently when information on significant changes in the customer’s financial position becomes known. In addition to the assignment to a risk category, a credit limit per customer is set.

The Company recognizes an allowance for credit losses to present the net amount of receivables expected to be collected at the balance sheet date. The allowance is based on the credit losses expected to arise over the asset's contractual term taking into account historical loss experience, customer-specific data as well as forward looking estimates. The Company's accounts receivable are first grouped by the individual legal entity which generally has a geographic concentration of receivables, resulting in different risk levels for different entities. Receivables are then further subdivided within the entity into pools based on similar risk characteristics to estimate expected credit losses. Expected credit losses are estimated individually when the related assets do not share similar risk characteristics.

Accounts receivable are written off when deemed uncollectible and are recognized as a deduction from the allowance for credit losses. Expected recoveries, which are not to exceed the amount previously written off, are considered in determining the allowance balance at the balance sheet date.

The Company, in its normal course of business, transfers receivables to third parties, generally without recourse. The transfer is accounted for as a sale when the Company has surrendered control over the receivables. Control is deemed to have been surrendered when (i) the transferred receivables have been put presumptively beyond the reach of the Company and its creditors, even in bankruptcy or other receivership, (ii) the third-party transferees have the right to pledge or exchange the transferred receivables, and (iii) the Company has relinquished effective control over the transferred receivables and does not retain the ability or obligation to repurchase or redeem the transferred receivables. At the time of sale, the sold receivables are removed from the Consolidated Balance Sheets and the related cash inflows are classified as operating activities in the Consolidated Statements of Cash Flows. Transfers of receivables that do not meet the requirements for treatment as sales are accounted for as secured borrowings and the related cash flows are classified as financing activities in the Consolidated Statements of Cash Flows.

Concentrations of credit risk

The Company sells a broad range of products, systems, services and software to a wide range of industrial, commercial and utility customers as well as various government agencies and quasi-governmental agencies throughout the world. Concentrations of credit risk with respect to accounts receivable are limited, as the Company's customer base is comprised of a large number of individual customers. Ongoing credit evaluations of customers' financial positions are performed to determine whether the use of credit support instruments such as guarantees, letters of credit or credit insurance are necessary; collateral is not generally required. The Company maintains an allowance for credit losses as discussed above in "Accounts receivable and allowance for expected credit losses". Such losses, in the aggregate, are in line with the Company's expectations.

It is the Company's policy to invest cash in deposits with banks throughout the world with certain minimum credit ratings and in high quality, low risk, liquid investments. The Company actively manages its credit risk by routinely reviewing the creditworthiness of the banks and the investments held. The Company has not incurred significant credit losses related to such investments.

The Company's exposure to credit risk on derivative financial instruments is the risk that the counterparty will fail to meet its obligations. To reduce this risk, the Company has credit policies that require the establishment and periodic review of credit limits for individual counterparties. In addition, the Company has entered into close-out netting agreements with most derivative counterparties. Close-out netting agreements provide for the termination, valuation and net settlement of some or all outstanding transactions between two counterparties on the occurrence of one or more pre-defined trigger events. Derivative instruments are presented on a gross basis in the Consolidated Financial Statements.

Revenue recognition

A customer contract exists if collectability under the contract is considered probable, the contract has commercial substance, contains payment terms, as well as the rights and commitments of both parties, and has been approved.

The Company offers arrangements with multiple performance obligations to meet its customers' needs. These arrangements may involve the delivery of multiple products and/or performance of services (such as installation and training) and the delivery and/or performance may occur at different points in time or over different periods of time. Goods and services under such arrangements are evaluated to determine whether they form distinct performance obligations and should be accounted for as separate revenue transactions. The Company allocates the sales price to each distinct performance obligation based on the price of each item sold in separate transactions at the inception of the arrangement.

The Company generally recognizes revenues for the sale of non-customized products including circuit breakers, modular substation packages, control products, motors, generators, drives, robots, measurement and analytical instrumentation, and other goods which are manufactured on a standardized basis at a point in time. Revenues are recognized at the point in time that the customer obtains control of the goods, which is when it has taken title to the products and assumed the risks and rewards of ownership of the products specified in the purchase order or sales agreement. Generally, the transfer of title and risks and rewards of ownership are governed by the contractually defined shipping terms. The Company uses various International Commercial Terms (as promulgated by the International Chamber of Commerce) in its sales of products to third party customers, such as Ex Works (EXW), Free Carrier (FCA) and Delivered Duty Paid (DDP).

Billing terms for these point in time contracts vary but generally coincide with delivery to the customer. Payment is generally due upon receipt of the invoice, payable within 90 days or less.

The Company generally recognizes revenues for the sale of customized products, including integrated automation and electrification systems and solutions, on an over time basis using the percentage-of-completion method of accounting. These systems are generally accounted for as a single performance obligation as the Company is required to integrate equipment and services into one deliverable for the customer. Revenues are recognized as the systems are customized during the manufacturing or integration process and as control is transferred to the customer as evidenced by the Company's right to payment for work performed or by the customer's ownership of the work in process. The Company principally uses the cost-to-cost method to measure progress towards completion on contracts. Under this method, progress of contracts is measured by actual costs incurred in relation to the Company's best estimate of total costs based on the Company's history of manufacturing or constructing similar assets for customers. Estimated costs are reviewed and updated routinely for contracts in progress to reflect changes in quantity or pricing of the inputs. The cumulative effect of any change in estimate is recorded in the period when the change in estimate is determined. Contract costs include all direct materials, labor and subcontract costs and indirect costs related to contract performance, such as indirect labor, supplies, tools and depreciation costs.

The nature of the Company's contracts for the sale of customized products gives rise to several types of variable consideration, including claims, unpriced change orders, liquidated damages and penalties. These amounts are estimated based upon the most likely amount of consideration to which the customer or the Company will be entitled. The estimated amounts are included in the sales price to the extent it is probable that a significant reversal of cumulative revenues recognized will not occur when the uncertainty associated with the variable consideration is resolved. All estimates of variable consideration are reassessed periodically. Back charges to suppliers or subcontractors are recognized as a reduction of cost when it is determined that recovery of such cost is probable and the amounts can be reliably estimated.

Billing terms for these over-time contracts vary but are generally based on achieving specified milestones. The differences between the timing of revenues recognized and customer billings result in changes to contract assets and contract liabilities. Payment is generally due upon receipt of the invoice, payable within 90 days or less. Contractual retention amounts billed to customers are generally due upon expiration of the contractual warranty period.

Service revenues reflect revenues earned from the Company's activities in providing services to customers primarily subsequent to the sale and delivery of a product or complete system. Such revenues consist of maintenance type contracts, repair services, equipment upgrades, field service activities that include personnel and accompanying spare parts, training, and installation and commissioning of products as a stand-alone service or as part of a service contract. The Company generally recognizes revenues from service transactions as services are performed or at the point in time that the customer obtains control of the spare parts. For long-term service contracts including monitoring and maintenance services, revenues are recognized on a straight-line basis over the term of the contract consistent with the nature, timing and extent of the services or, if the performance pattern is other than straight line, as the services are provided based on costs incurred relative to total expected costs.

In limited circumstances the Company sells extended warranties that extend the warranty coverage beyond the standard coverage offered on specific products. Revenues for these warranties are recorded over the length of the warranty period based on their stand-alone selling price.

Billing terms for service contracts vary but are generally based on the occurrence of a service event. Payment is generally due upon receipt of the invoice, payable within 90 days or less.

Revenues are reported net of customer rebates, early settlement discounts, and similar incentives. Rebates are estimated based on sales terms, historical experience and trend analysis. The most common incentives relate to amounts paid or credited to customers for achieving defined volume levels.

Taxes assessed by a governmental authority that are directly imposed on revenue-producing transactions between the Company and its customers, such as sales, use, value added and some excise taxes, are excluded from revenues.

The Company does not adjust the contract price for the effects of a financing component if the Company expects, at contract inception, that the time between control transfer and cash receipt is less than 12 months.

Sales commissions are expensed immediately when the amortization period for the costs to obtain the contract is less than a year.

Contract loss provisions

Losses on contracts are recognized in the period when they are identified and are based upon the anticipated excess of contract costs over the related contract revenues.

Shipping and handling costs

Shipping and handling costs are recorded as a component of cost of sales.

Inventories

Inventories are stated at the lower of cost or net realizable value. Cost is determined using the first-in, first-out method, the weighted-average cost method, or the specific identification method. Inventoried costs are stated at acquisition cost or actual production cost, including direct material and labor and applicable manufacturing overheads. Adjustments to reduce the cost of inventory to its net realizable value are made, if required, for decreases in sales prices, obsolescence or similar reductions in value.

Impairment of long-lived assets

Long-lived assets that are held and used are evaluated for impairment for each of the Company's asset groups when events or circumstances indicate that the carrying amount of the long-lived asset or asset group may not be recoverable. If the asset group's net carrying value exceeds the asset group's net undiscounted cash flows expected to be generated over its remaining useful life including net proceeds expected from disposition of the asset group, if any, the carrying amount of the asset group is reduced to its estimated fair value. The estimated fair value is determined using a market, income and/or cost approach.

Property, plant and equipment

Property, plant and equipment is stated at cost, less accumulated depreciation and is depreciated using the straight-line method. The estimated useful lives of the assets are generally as follows:

- factories and office buildings: 30 to 40 years,
- other facilities: 15 years,
- machinery and equipment: 3 to 15 years,
- furniture and office equipment: 3 to 8 years, and
- leasehold improvements are depreciated over their estimated useful life or, for operating leases, over the lease term, if shorter.

Goodwill and intangible assets

Goodwill is reviewed for impairment annually as of October 1, or more frequently if events or circumstances indicate that the carrying value may not be recoverable.

Goodwill is evaluated for impairment at the reporting unit level. A reporting unit is an operating segment or one level below an operating segment. For the annual impairment reviews performed in 2023 the reporting units were determined to be one level below the operating segments.

When evaluating goodwill for impairment, the Company uses either a qualitative or quantitative assessment method for each reporting unit. The qualitative assessment involves determining, based on an evaluation of qualitative factors, if it is more likely than not that the fair value of a reporting unit is less than its carrying value. If, based on this qualitative assessment, it is determined to be more likely than not that the reporting unit's fair value is less than its carrying value, a quantitative impairment test is performed, otherwise no further analysis is required. If the Company elects not to perform the qualitative assessment for a reporting unit, then a quantitative impairment test is performed.

When performing a quantitative impairment test, the Company generally calculates the fair value of a reporting unit using an income approach based on the present value of future cash flows, applying a discount rate that represents the reporting unit's weighted-average cost of capital, and compares it to the reporting unit's carrying value. If the carrying value of the net assets of a reporting unit exceeds the fair value of the reporting unit then the Company records an impairment charge equal to the difference, provided that the loss recognized does not exceed the total amount of goodwill allocated to that reporting unit.

The cost of acquired intangible assets with a finite life is amortized using a method of amortization that reflects the pattern of intangible assets' expected contributions to future cash flows. If that pattern cannot be reliably determined, the straight-line method is used. The amortization periods range from 3 to 5 years for software and from 5 to 20 years for customer-, technology- and marketing-related intangibles. Intangible assets with a finite life are tested for impairment upon the occurrence of certain triggering events.

Derivative financial instruments and hedging activities

The Company uses derivative financial instruments to manage currency, commodity, interest rate and equity exposures, arising from its global operating, financing and investing activities (see Note 6).

The Company recognizes all derivatives, other than certain derivatives indexed to the Company's own stock, at fair value in the Consolidated Balance Sheets. Derivatives that are not designated as hedging instruments are reported at fair value with derivative gains and losses reported through earnings and classified consistent with the nature of the underlying transaction.

If the derivatives are designated as a hedge, depending on the nature of the hedge, changes in the fair value of the derivatives will either be offset against the change in fair value of the hedged item attributable to the risk being hedged through earnings (in the case of a fair value hedge) or recognized in Accumulated other comprehensive loss until the hedged item is recognized in earnings (in the case of a cash flow hedge). Where derivative financial instruments have been designated as cash flow hedges of forecasted transactions and such forecasted transactions are no longer probable of occurring, hedge accounting is discontinued and any derivative gain or loss previously included in Accumulated other comprehensive loss is reclassified into earnings consistent with the nature of the original forecasted transaction. Gains or losses from derivatives designated as hedging instruments in a fair value hedge are reported through earnings and classified consistent with the nature of the underlying hedged transaction.

Certain commercial contracts may grant rights to the Company or the counterparties, or contain other provisions that are considered to be derivatives. Such embedded derivatives are assessed at inception of the contract and depending on their characteristics, accounted for as separate derivative instruments and shown at their fair value in the Consolidated Balance Sheets with changes in their fair value reported in earnings consistent with the nature of the commercial contract to which they relate.

Derivatives are classified in the Consolidated Statements of Cash Flows in the same section as the underlying item. Cash flows from the settlement of undesignated derivatives used to manage the risks of different underlying items on a net basis are classified within "Net cash provided by operating activities", as the underlying items are primarily operational in nature. Other cash flows on the settlement of derivatives are recorded within "Net cash provided by (used in) investing activities".

Leases

The Company leases primarily real estate, vehicles, machinery and equipment.

The Company evaluates if a contract contains a lease at inception of the contract. A contract is or contains a lease if it conveys the right to control the use of identified property, plant, or equipment (an identified asset) for a period of time in exchange for consideration. To determine this, the Company assesses whether, throughout the period of use, it has both the right to obtain substantially all of the economic benefits from the use of the identified asset and the right to direct the use of the identified asset. Leases are classified as either finance or operating, with the classification determining the pattern of expense recognition in the Consolidated Income Statements. Lease expense for operating leases is recorded on a straight-line basis over the lease term. Lease expense for finance leases is separated between amortization of right-of-use assets and lease interest expense.

In many cases, the Company's leases include one or more options to renew, with renewal terms that can extend up to 5 years. The exercise of lease renewal options is at the Company's discretion. Renewal periods are included in the expected lease term if they are reasonably certain of being exercised by the Company. Certain leases also include options to purchase the leased property. None of the Company's lease agreements contain material residual value guarantees or material restrictions or covenants.

Long-term leases (leases with terms greater than 12 months) are recorded in the Consolidated Balance Sheets at the commencement date of the lease based on the present value of the minimum lease payments. The present value of the lease payments is determined by using the interest rate implicit in the lease if available. As most of the Company's leases do not provide an implicit rate, the Company's incremental borrowing rate is used for most leases and is determined for portfolios of leases based on the remaining lease term, currency of the lease, and the internal credit rating of the subsidiary which entered into the lease.

Short-term leases (leases with an initial lease term of 12 months or less and where it is reasonably certain that the identified asset will not be leased for a term greater than 12 months) are not recorded in the Consolidated Balance Sheets and are expensed on a straight-line basis over the lease term. The majority of short-term leases relate to real estate and machinery.

Assets under operating lease are included in Operating lease right-of-use assets. Operating lease liabilities are reported both as current and non-current operating lease liabilities. Right-of-use assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent its obligation to make lease payments arising from the lease.

Assets under finance lease are included in Property, plant and equipment, net while finance lease liabilities are included in Long-term debt (including Current maturities of long-term debt as applicable).

Lease and non-lease components for leases other than real estate are not accounted for separately.

Income taxes

The Company uses the asset and liability method to account for deferred taxes. Under this method, deferred tax assets and liabilities are determined based on temporary differences between the financial reporting and the tax bases of assets and liabilities. Deferred tax assets and liabilities are measured using enacted tax rates and laws that are expected to be in effect when the differences are expected to reverse. The Company records a deferred tax asset when it determines that it is more likely than not that the deduction will be sustained based upon the deduction's technical merit. Deferred tax assets and liabilities that can be offset against each other are reported on a net basis. A valuation allowance is recorded to reduce deferred tax assets to the amount that is more likely than not to be realized.

Deferred taxes are provided on unredeemed retained earnings of the Company's subsidiaries. However, deferred taxes are not provided on such unredeemed retained earnings to the extent it is expected that the earnings are permanently reinvested. Such earnings may become taxable upon the sale or liquidation of these subsidiaries or upon the remittance of dividends.

The Company operates in numerous tax jurisdictions and, as a result, is regularly subject to audit by tax authorities. The Company provides for tax contingencies whenever it is deemed more likely than not that a tax asset has been impaired or a tax liability has been incurred. Contingency provisions are recorded based on the technical merits of the Company's filing position, considering the applicable tax laws and Organisation for Economic Co-operation and Development (OECD) guidelines and are based on its evaluations of the facts and circumstances as of the end of each reporting period.

The Company applies a two-step approach to recognize and measure uncertainty in income taxes. The first step is to evaluate the tax position for recognition by determining if the weight of available evidence indicates that it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount which is more than 50 percent likely of being realized upon ultimate settlement. Uncertain tax positions that could be settled against existing loss carryforwards or income tax credits are reported net.

Expenses related to tax penalties are classified in the Consolidated Income Statements as “Income tax expense” while interest thereon is classified as “Interest and other finance expense”. Current income tax relating to certain items is recognized directly in Accumulated other comprehensive loss and not in earnings. In general, the Company applies the individual items approach when releasing income tax effects from Accumulated other comprehensive loss.

Research and development

Research and development costs not related to specific customer orders are generally expensed as incurred.

Earnings per share

Basic earnings per share is calculated by dividing income by the weighted-average number of shares outstanding during the year. Diluted earnings per share is calculated by dividing income by the weighted-average number of shares outstanding during the year, assuming that all potentially dilutive securities were exercised, if dilutive. Potentially dilutive securities comprise outstanding written call options, outstanding options and shares granted subject to certain conditions under the Company’s share-based payment arrangements. See further discussion related to earnings per share in Note 20 and of potentially dilutive securities in Note 18.

Share-based payment arrangements

The Company has various share-based payment arrangements for its employees, which are described more fully in Note 18. Such arrangements are accounted for under the fair value method. For awards that are equity-settled, total compensation is measured at grant date, based on the fair value of the award at that date, and recorded in earnings over the period the employees are required to render service. For awards that are cash-settled, compensation is initially measured at grant date and subsequently remeasured at each reporting period, based on the fair value and vesting percentage of the award at each of those dates, with changes in the liability recorded in earnings.

Fair value measures

The Company uses fair value measurement principles to record certain financial assets and liabilities on a recurring basis and, when necessary, to record certain non-financial assets at fair value on a non-recurring basis, as well as to determine fair value disclosures for certain financial instruments carried at amortized cost in the financial statements. Financial assets and liabilities recorded at fair value on a recurring basis include foreign currency, commodity and interest rate derivatives, as well as cash-settled call options and available-for-sale securities. Non-financial assets recorded at fair value on a non-recurring basis include long-lived assets that are reduced to their estimated fair value due to impairments.

Fair value is the price that would be received when selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. In determining fair value, the Company uses various valuation techniques including the market approach (using observable market data for identical or similar assets and liabilities), the income approach (discounted cash flow method) and the cost approach (using costs a market participant would incur to develop a comparable asset). Inputs used to determine the fair value of assets and liabilities are defined by a three-level hierarchy, depending on the nature of those inputs. The Company has categorized its financial assets and liabilities and non-financial assets measured at fair value within this hierarchy based on whether the inputs to the valuation technique are observable or unobservable. An observable input is based on market data obtained from independent sources, while an unobservable input reflects the Company’s assumptions about market data.

The levels of the fair value hierarchy are as follows:

Level 1: Valuation inputs consist of quoted prices in an active market for identical assets or liabilities (observable quoted prices). Assets and liabilities valued using Level 1 inputs include exchange-traded equity securities, listed derivatives which are actively traded such as commodity futures, interest rate futures and certain actively traded debt securities.

Level 2: Valuation inputs consist of observable inputs (other than Level 1 inputs) such as actively quoted prices for similar assets, quoted prices in inactive markets and inputs other than quoted prices such as interest rate yield curves, credit spreads, or inputs derived from other observable data by interpolation, correlation, regression or other means. The adjustments applied to quoted prices or the inputs used in valuation models may be both observable and unobservable. In these cases, the fair value measurement is classified as Level 2 unless the unobservable portion of the adjustment or the unobservable input to the valuation model is significant, in which case the fair value measurement would be classified as Level 3. Assets and liabilities valued or disclosed using Level 2 inputs include investments in certain funds, certain debt securities that are not actively traded, interest rate swaps, cross-currency interest rate swaps, commodity swaps, cash-settled call options, forward foreign exchange contracts, foreign exchange swaps and forward rate agreements, time deposits, as well as financing receivables and debt.

Level 3: Valuation inputs are based on the Company's assumptions of relevant market data (unobservable input). Assets valued or disclosed using Level 3 inputs include insurance contracts and certain private equity investments.

Investments in private equity, real estate and collective funds held within the Company's pension plans are generally valued using the net asset value (NAV) per share as a practical expedient for fair value provided certain criteria are met. The NAVs are determined based on the fair values of the underlying investments in the funds. These assets are not classified in the fair value hierarchy but are separately disclosed.

Whenever quoted prices involve bid-ask spreads, the Company ordinarily determines fair values based on mid-market quotes. However, for the purpose of determining the fair value of cash-settled call options serving as hedges of the Company's management incentive plan (MIP), bid prices are used.

When determining fair values based on quoted prices in an active market, the Company considers if the level of transaction activity for the financial instrument has significantly decreased, or would not be considered orderly. In such cases, the resulting changes in valuation techniques would be disclosed. If the market is considered disorderly or if quoted prices are not available, the Company is required to use another valuation technique, such as an income approach.

Disclosures about the Company's fair value measurements of assets and liabilities are included in Note 7.

Contingencies

The Company is subject to proceedings, litigation or threatened litigation and other claims and inquiries, related to environmental, labor, product, regulatory, tax (other than income tax) and other matters, and is required to assess the likelihood of any adverse judgments or outcomes to these matters, as well as potential ranges of probable losses. A determination of the provision required, if any, for these contingencies is made after analysis of each individual issue, often with assistance from both internal and external legal counsel and technical experts. The required amount of a provision for a contingency of any type may change in the future due to new developments in the particular matter, including changes in the approach to its resolution.

The Company records a provision for its contingent obligations when it is probable that a loss will be incurred and the amount can be reasonably estimated. Any such provision is generally recognized on an undiscounted basis using the Company's best estimate of the amount of loss incurred or at the lower end of an estimated range when a single best estimate is not determinable. In some cases, the Company may be able to recover a portion of the costs relating to these obligations from insurers or other third parties; however, the Company records such amounts only when it is probable that they will be collected.

The Company generally provides for anticipated costs for warranties when it delivers the related products. Warranty costs include calculated costs arising from imperfections in design, material and workmanship in the Company's products. The Company makes individual assessments on contracts with risks resulting from order-specific conditions or guarantees and assessments on an overall, statistical basis for similar products sold in larger quantities.

The Company may have legal obligations to perform environmental clean-up activities related to land and buildings as a result of the normal operations of its business. In some cases, the timing or the method of settlement, or both, are conditional upon a future event that may or may not be within the control of the Company, but the underlying obligation itself is unconditional and certain. The Company recognizes a provision for these obligations when it is probable that a liability for the clean-up activity has been incurred and a reasonable estimate of its fair value can be made. In some cases, a portion of the costs expected to be incurred to settle these matters may be recoverable. An asset is recorded when it is probable that such amounts are recoverable. Provisions for environmental obligations are not discounted to their present value when the timing of payments cannot be reasonably estimated.

Pensions and other postretirement benefits

The Company has a number of defined benefit pension plans, defined contribution pension plans and termination indemnity plans. For plans accounted for as a defined benefit pension plan, the Company recognizes an asset for such a plan's overfunded status or a liability for such a plan's underfunded status in its Consolidated Balance Sheets. Additionally, the Company measures such a plan's assets and obligations that determine its funded status as of the end of the year and recognizes the changes in the funded status in the year in which the changes occur. Those changes are reported in Accumulated other comprehensive loss.

The Company uses actuarial valuations to determine its pension and postretirement benefit costs and credits. The amounts calculated depend on a variety of key assumptions, including discount rates and expected return on plan assets. Current market conditions are considered in selecting these assumptions.

The Company's various pension plan assets are assigned to their respective levels in the fair value hierarchy in accordance with the valuation principles described in the "Fair value measures" section above.

See Note 17 for further discussion of the Company's employee benefit plans.

Business combinations

The Company accounts for assets acquired and liabilities assumed in business combinations using the acquisition method and records these at their respective fair values. Contingent consideration is recorded at fair value as an element of purchase price with subsequent adjustments recognized in income. Acquired contract assets and liabilities are valued and recorded in accordance with the principles for recognizing revenues from contracts with customers as outlined in the section entitled Revenue recognition above.

Identifiable intangibles consist of intellectual property such as trademarks and trade names, customer relationships, patented and unpatented technology, in-process research and development, order backlog and capitalized software; these are amortized over their estimated useful lives. Such intangibles are subsequently subject to evaluation for potential impairment if events or circumstances indicate the carrying amount may not be recoverable. See "Goodwill and intangible assets" above. Acquisition-related costs are recognized separately from the acquisition and expensed as incurred. Upon gaining control of an entity in which an equity method or cost basis investment was held by the Company, the carrying value of that investment is adjusted to fair value with the related gain or loss recorded in income.

Deferred tax assets and liabilities based on temporary differences between the financial reporting and the tax base of assets and liabilities, as well as uncertain tax positions and valuation allowances on acquired deferred tax assets assumed in connection with a business combination, are initially estimated as of the acquisition date based on facts and circumstances that existed at the acquisition date. Changes in deferred taxes, uncertain tax positions and valuation allowances on acquired deferred tax assets that occur after the measurement period are recognized in income.

Estimated fair values of acquired assets and liabilities are subject to change within the measurement period (a period of up to 12 months after the acquisition date during which the acquirer may adjust the provisional acquisition amounts) with any adjustments to the preliminary estimates being recorded to goodwill.

New accounting pronouncements

Applicable for current period

Disclosure about supplier finance program obligations

In January 2023, the Company adopted an accounting standard update which requires entities to disclose information related to supplier finance programs. Under the update, the Company is required to disclose annually (i) the key terms of the program, (ii) the amount of the supplier finance obligations outstanding and where those obligations are presented in the balance sheet at the reporting date, and (iii) a rollforward of the supplier finance obligation program within the reporting period. The Company adopted this update retrospectively for all in-scope transactions, with the exception of the rollforward disclosures, which will be adopted prospectively for annual periods beginning January 1, 2024. Apart from the additional disclosure requirements, this update does not have a significant impact on the Company's Consolidated Financial Statements.

The total outstanding supplier finance obligation included in Accounts payable, trade in the Consolidated Balance Sheets at December 31, 2023 and 2022, amounted to $415 million and $477 million, respectively. The Company's payment terms related to suppliers' finance programs are not impacted by the suppliers' decisions to sell amounts under the arrangements and are typically consistent with local market practices.

Facilitation of the effects of reference rate reform on financial reporting

In January 2023, the Company adopted an accounting standard update which provides temporary optional expedients and exceptions to the current guidance on contract modifications and hedge accounting to ease the financial reporting burdens related to the expected market transition from the London Interbank Offered Rate (LIBOR) and other interbank offered rates to alternative reference rates. The Company is applying this standard update as relevant contract and hedge accounting relationship modifications are made during the course of the transition period ending December 31, 2024. This update does not have a significant impact on the Company's Consolidated Financial Statements.

Applicable for future periods

Improvements to reportable segment disclosures

In November 2023, an accounting standard update was issued which requires the Company to disclose additional reportable segment information primarily through enhanced disclosures about significant segment expenses and extending certain annual disclosure requirements to quarterly. This update is effective for the Company for annual periods beginning January 1, 2024, and interim periods beginning January 1, 2025, and is to be applied retrospectively to each prior reporting period presented. The Company is currently evaluating the impact of adopting this update on its Consolidated Financial Statements.

Improvements to income tax disclosures

In December 2023, an accounting standard update was issued which requires the Company to disclose additional information related to income taxes. Under the update, the Company is required to annually disclose by jurisdiction (i) additional disaggregated information within the tax rate reconciliation and (ii) income taxes paid. This update is effective for the Company prospectively, with retrospective adoption permitted, for annual periods beginning January 1, 2025. The Company is currently evaluating the impact of adopting this update on its Consolidated Financial Statements.

Note 3
Discontinued operations

In 2020, the Company completed the divestment of its Power Grids business to Hitachi Ltd (Hitachi). As this divestment represented a strategic shift that would have a major effect on the Company's operations and financial results, the results of operations for this business were presented as discontinued operations. Certain of the business contracts in the Power Grids business continue to be executed by subsidiaries of the Company for the benefit/risk of Hitachi Energy Ltd (Hitachi Energy). The remaining business activities of the Power Grids business being executed by the Company are not significant.

In connection with the divestment, the Company recorded liabilities in discontinued operations for the initial estimated future costs and other cash payments of $487 million for various contractual items relating to the sale of the business. In 2021, the Company and Hitachi concluded an agreement to settle the various amounts owed by the Company. During 2023, 2022 and 2021, total cash payments of $23 million, $102 million and $364 million, respectively, were made under the settlement agreement.

Upon closing of the sale, the Company entered into various transition services agreements (TSAs), some of which continue to have services performed. Pursuant to these TSAs, the Company and Hitachi Energy provide to each other, on a transitional basis, various services. The services provided by the Company primarily include finance, information technology, human resources and certain other administrative services. The TSAs were to be performed for up to 3 years with the possibility to agree on extensions on an exceptional basis for business-critical services which are reasonably necessary to avoid a material adverse impact on the business. The TSA for information technology services was extended until mid-2025. In 2023, 2022 and 2021, the Company recognized, within its continuing operations, general and administrative expenses incurred to perform the TSAs, offset by $121 million, $162 million and $173 million, respectively, in TSA-related income for such services that is reported in Other income (expense), net.

In addition, the Company also has retained obligations (primarily for environmental and taxes) related to other businesses disposed or otherwise exited that qualified as discontinued operations. Changes to these retained obligations are also included in Loss from discontinued operations, net of tax.

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Note 4
Acquisitions, divestments and equity-accounted companies

Acquisitions of controlling interests

Acquisitions of controlling interests were as follows:

($ in millions, except number of acquired businesses)	2023	2022	2021
Purchase price for acquisitions (net of cash acquired)(1)	175	195	212
Aggregate excess of purchase price over fair value of net assets acquired(2)	142	229	161
Number of acquired businesses	7	5	2

(1) Excluding changes in cost- and equity-accounted companies.
(2) Recorded as goodwill (see Note 11).

In the table above, the “Purchase price for acquisitions” and “Aggregate excess of purchase price over fair value of net assets acquired” amounts for 2022, relate primarily to the acquisition of InCharge Energy, Inc. (In-Charge) and in 2021, relate primarily to the acquisition of ASTI Mobile Robotics Group SL (ASTI). In 2023, there were no significant acquisitions.

Acquisitions of controlling interests have been accounted for under the acquisition method and have been included in the Company’s Consolidated Financial Statements since the date of acquisition.

On January 26, 2022, the Company increased its ownership in In-Charge to a 60 percent controlling interest through a stock purchase agreement. In-Charge is headquartered in Santa Monica, USA, and is a provider of turn-key commercial electric vehicle charging hardware and software solutions. The resulting cash outflows for the Company amounted to $134 million (net of cash acquired of $4 million). The acquisition expands the market presence of the E-mobility operating segment, particularly in the North American market. In connection with the acquisition, the Company’s pre-existing 13.2 percent ownership of In-Charge was revalued to fair value and a gain of $32 million was recorded in Other income (expense), net in 2022. The Company entered into an agreement with the remaining noncontrolling shareholders allowing either party to put or call the remaining 40 percent of the shares until 2027. The amount for which either party can exercise their option is dependent on a formula based on revenues and thus, the amount is subject to change. As a result of this agreement, the noncontrolling interest is classified as Redeemable noncontrolling interest (i.e. mezzanine equity) in the Consolidated Balance Sheets and was initially recognized at fair value.

On August 2, 2021, the Company acquired the shares of ASTI. ASTI is headquartered in Burgos, Spain, and is a global autonomous mobile robot (AMR) manufacturer. The resulting cash outflows for the Company amounted to $186 million (net of cash acquired). The acquisition expands the Company's robotics and automation offering in its Robotics & Discrete Automation operating segment.

While the Company uses its best estimates and assumptions as part of the purchase price allocation process to value assets acquired and liabilities assumed at the acquisition date, the purchase price allocation for acquisitions is preliminary for up to 12 months after the acquisition date and is subject to refinement as more detailed analyses are completed and additional information about the fair values of the acquired assets and liabilities becomes available.

Business divestments and spin-offs

In 2023, the Company received proceeds (net of transaction costs and cash disposed) of $553 million, relating to divestments of consolidated businesses and recorded gains of $101 million, in Other income (expense), net on the sale of such businesses. These are primarily due to the divestment of the Company's Power Conversion Division to AcBel Polytech Inc., which prior to its sale was part of the Company's Electrification operating segment. Certain amounts included in the net gain for the sale of the Power Conversion Division are estimated or otherwise subject to change in value and, as a result, the Company may record additional adjustments to the gain in future periods which are not expected to have a material impact on the Consolidated Financial Statements.

On September 7, 2022, the shareholders approved the spin-off of the Company's Turbocharging Division into an independent, publicly traded company, Accelleron Industries AG (Accelleron), which was completed through the distribution of common stock of Accelleron to the stockholders of ABB on October 3, 2022. As a result of the spin-off of this Division, the Company distributed net assets of $272 million, net of amounts attributable to noncontrolling interests of $12 million, which was reflected as a reduction in Retained earnings. In addition, total accumulated comprehensive income of $95 million, including the cumulative translation adjustment, was reclassified to Retained earnings. Cash and cash equivalents distributed with Accelleron was $172 million. The results of operations of the Turbocharging Division, are included in the continuing operations of the Process Automation operating segment for all periods presented through to the spin-off date. In 2022 and 2021, Income from continuing operations before taxes, included income of $134 million and $186 million, respectively, from this Division. In anticipation of the spin-off, the Company granted to a subsidiary of Accelleron access to funds in the form of a short-term intercompany loan. At the spin-off date, this loan, having a principal amount of 300 million Swiss francs ($306 million at the date of spin-off), was due to the Company and subsequently collected in October 2022.

In 2021, the Company received proceeds (net of transaction costs and cash disposed) of $2,958 million, relating to divestments of consolidated businesses and recorded gains of $2,193 million in Other income (expense), net on the sales of such businesses. These are primarily due to the divestment of the Company's Mechanical Power Transmission Division (Dodge) to RBC Bearings Inc. In 2021 Income from continuing operations before taxes, included net income of $115 million from the Dodge business which, prior to its sale was part of the Company's Motion operating segment.

Investments in equity-accounted companies

In connection with the divestment of its Power Grids business to Hitachi in 2020 (see Note 3), the Company initially retained a 19.9 percent interest in the business until December 2022, when the retained investment was sold to Hitachi. During the Company's period of ownership of the retained 19.9 percent interest, based on its continuing involvement with the Power Grids business, including the membership in its governing board of directors, the Company concluded that it had significant influence over Hitachi Energy. As a result, the investment was accounted for using the equity method through to the date of its sale.

In September 2022, the Company and Hitachi agreed terms to sell the Company's remaining investment in Hitachi Energy to Hitachi and simultaneously settle certain outstanding contractual obligations relating to the initial sale of the Power Grids business, including certain indemnification guarantees (see Note 15). The sale of the remaining investment was completed in December 2022, resulting in cash proceeds of $1,552 million and a gain of $43 million which was recorded in Other income (expense), net.

In 2023, 2022 and 2021, the Company recorded its share of the earnings of investees accounted for under the equity method of accounting in Other income (expense), net, as follows:

($ in millions)	2023	2022	2021
Income (loss) from equity-accounted companies, net of taxes	(16)	(22)	38
Basis difference amortization (net of deferred income tax benefit)	—	(80)	(138)
Loss from equity-accounted companies	**(16)**	**(102)**	**(100)**

Note 5
Cash and equivalents, marketable securities and short-term investments

Cash and equivalents and marketable securities and short-term investments consisted of the following:

December 31, 2023 ($ in millions)	Cost basis	Gross unrealized gains	Gross unrealized losses	Fair value	Cash and equivalents and restricted cash	Marketable securities and short-term investments
Changes in fair value recorded in net income						
Cash	1,449			**1,449**	1,449	
Time deposits	2,923			**2,923**	2,460	463
Equity securities	1,250	32		**1,282**		1,282
	5,622	**32**	**—**	**5,654**	**3,909**	**1,745**
Changes in fair value recorded in other comprehensive income						
Debt securities available-for-sale:						
—U.S. government obligations	189	2	(8)	**183**		183
	189	**2**	**(8)**	**183**	**—**	**183**
Total	**5,811**	**34**	**(8)**	**5,837**	**3,909**	**1,928**
Of which:						
—Restricted cash, current					18	

December 31, 2022 ($ in millions)	Cost basis	Gross unrealized gains	Gross unrealized losses	Fair value	Cash and equivalents and restricted cash	Marketable securities and short-term investments
Changes in fair value recorded in net income						
Cash	1,715			**1,715**	1,715	
Time deposits	2,459			**2,459**	2,459	
Equity securities	345	10		**355**		355
	4,519	**10**	**—**	**4,529**	**4,174**	**355**
Changes in fair value recorded in other comprehensive income						
Debt securities available-for-sale:						
—U.S. government obligations	269	1	(15)	**255**		255
—Other government obligations	58			**58**		58
—Corporate	64		(7)	**57**		57
	391	**1**	**(22)**	**370**	**—**	**370**
Total	**4,910**	**11**	**(22)**	**4,899**	**4,174**	**725**
Of which:						
—Restricted cash, current					18	

Contractual maturities

Contractual maturities of debt securities consisted of the following:

December 31, 2023 ($ in millions)	Available-for-sale	
	Cost basis	Fair value
One to five years	129	126
Six to ten years	57	54
Due after ten years	3	3
Total	**189**	**183**

At December 31, 2023 and 2022, the Company pledged $48 million and $69 million, respectively, of available-for-sale marketable securities as collateral for issued letters of credit and other security arrangements.

Note 6
Derivative financial instruments

The Company is exposed to certain currency, commodity, and interest rate risks arising from its global operating, financing and investing activities. The Company uses derivative instruments to reduce and manage the economic impact of these exposures.

Currency risk

Due to the global nature of the Company's operations, many of its subsidiaries are exposed to currency risk in their operating activities from entering into transactions in currencies other than their functional currency. To manage such currency risks, the Company's policies require its subsidiaries to hedge their foreign currency exposures from binding sales and purchase contracts denominated in foreign currencies. For forecasted foreign currency denominated sales of standard products and the related foreign currency denominated purchases, the Company's policy is to hedge up to a maximum of 100 percent of the forecasted foreign currency denominated exposures, depending on the length of the forecasted exposures. Forecasted exposures greater than 12 months are not hedged. Forward foreign exchange contracts are the main instrument used to protect the Company against the volatility of future cash flows (caused by changes in exchange rates) of contracted and forecasted sales and purchases denominated in foreign currencies. In addition, within its treasury operations, the Company primarily uses foreign exchange swaps and forward foreign exchange contracts to manage the currency and timing mismatches arising in its liquidity management activities.

Commodity risk

Various commodity products are used in the Company's manufacturing activities. Consequently it is exposed to volatility in future cash flows arising from changes in commodity prices. To manage the price risk of commodities, the Company's policies require that its subsidiaries hedge the commodity price risk exposures from binding contracts, as well as at least 50 percent (up to a maximum of 100 percent) of the forecasted commodity exposure over the next 12 months or longer (up to a maximum of 18 months). Primarily swap contracts are used to manage the associated price risks of commodities.

Interest rate risk

The Company has issued bonds at fixed rates. Interest rate swaps and cross-currency interest rate swaps are used to manage the interest rate and foreign currency risk associated with certain debt and generally such swaps are designated as fair value hedges. In addition, from time to time, the Company uses instruments such as interest rate swaps, interest rate futures, bond futures or forward rate agreements to manage interest rate risk arising from the Company's balance sheet structure but does not designate such instruments as hedges.

Volume of derivative activity

In general, while the Company's primary objective in its use of derivatives is to minimize exposures arising from its business, certain derivatives are designated and qualify for hedge accounting treatment while others either are not designated or do not qualify for hedge accounting.

Foreign exchange and interest rate derivatives

The gross notional amounts of outstanding foreign exchange and interest rate derivatives (whether designated as hedges or not) were as follows:

Type of derivative	Total notional amounts at December 31,		
($ in millions)	2023	2022	2021
Foreign exchange contracts	12,335	13,509	11,276
Embedded foreign exchange derivatives	1,137	933	815
Cross-currency interest rate swaps	886	855	906
Interest rate contracts	1,606	2,830	3,541

Derivative commodity contracts

The Company uses derivatives to hedge its direct or indirect exposure to the movement in the prices of commodities which are primarily copper, silver, steel and aluminum. The following table shows the notional amounts of outstanding derivatives (whether designated as hedges or not), on a net basis, to reflect the Company's requirements for these commodities:

		Total notional amounts at December 31,		
Type of derivative	Unit	2023	2022	2021
Copper swaps	metric tonnes	35,015	29,281	36,017
Silver swaps	ounces	2,359,363	2,012,213	2,842,533
Steel swaps	metric tonnes	10,206	—	145
Aluminum swaps	metric tonnes	5,900	6,825	7,125

Cash flow hedges

As noted above, the Company mainly uses forward foreign exchange contracts to manage the foreign exchange risk of its operations and commodity swaps to manage its commodity risks. The Company applies cash flow hedge accounting in only limited cases. In these cases, the effective portion of the changes in their fair value is recorded in Accumulated other comprehensive loss and subsequently reclassified into earnings in the same line item and in the same period as the underlying hedged transaction affects earnings. In 2023, 2022 and 2021, there were no significant amounts recorded for cash flow hedge accounting activities.

Fair value hedges

To reduce its interest rate exposure arising primarily from its debt issuance activities, the Company uses interest rate swaps and cross-currency interest rate swaps. Where such instruments are designated as fair value hedges, the changes in the fair value of these instruments, as well as the changes in the fair value of the risk component of the underlying debt being hedged, are recorded as offsetting gains and losses in Interest and other finance expense.

The effect of derivative instruments, designated and qualifying as fair value hedges, on the Consolidated Income Statements was as follows:

($ in millions)		2023	2022	2021
Gains (losses) recognized in Interest and other finance expense:				
Interest rate contracts	Designated as fair value hedges	44	(91)	(55)
	Hedged item	(45)	93	56
Cross-currency interest rate swaps	Designated as fair value hedges	30	(134)	(37)
	Hedged item	(40)	135	34

Derivatives not designated in hedge relationships

Derivative instruments that are not designated as hedges or do not qualify as either cash flow or fair value hedges are economic hedges used for risk management purposes. Gains and losses from changes in the fair values of such derivatives are recognized in the same line in the income statement as the economically hedged transaction.

Furthermore, under certain circumstances, the Company is required to split and account separately for foreign currency derivatives that are embedded within certain binding sales or purchase contracts denominated in a currency other than the functional currency of the subsidiary and the counterparty.

The gains (losses) recognized in the Consolidated Income Statements on derivatives not designated in hedging relationships were as follows:

($ in millions)	Gains (losses) recognized in income			
Type of derivative not designated as a hedge	**Location**	**2023**	**2022**	**2021**
Foreign exchange contracts	Total revenues	145	(56)	3
	Total cost of sales	(71)	21	(53)
	SG&A expenses[1]	27	27	11
	Non-order related research and development	(7)	—	(2)
	Interest and other finance expense	(240)	(128)	(173)
Embedded foreign exchange contracts	Total revenues	18	(3)	(7)
	Total cost of sales	1	(11)	(2)
Commodity contracts	Total cost of sales	(3)	(47)	78
Other	Interest and other finance expense	1	4	—
Total		**(129)**	**(193)**	**(145)**

(1) SG&A expenses represent "Selling, general and administrative expenses".

The fair values of derivatives included in the Consolidated Balance Sheets were as follows:

	Derivative assets		Derivative liabilities	
December 31, 2023 ($ in millions)	**Current in "Other current assets"**	**Non-current in "Other non-current assets"**	**Current in "Other current liabilities"**	**Non-current in "Other non-current liabilities"**
Derivatives designated as hedging instruments:				
Foreign exchange contracts	—	—	5	2
Interest rate contracts	—	—	18	—
Cross-currency interest rate swaps	—	—	—	230
Other	10	—	—	—
Total	**10**	**—**	**23**	**232**
Derivatives not designated as hedging instruments:				
Foreign exchange contracts	123	30	177	9
Commodity contracts	8	—	3	—
Interest rate contracts	1	—	1	—
Other equity contracts	4	—	—	—
Embedded foreign exchange derivatives	23	5	26	5
Total	**159**	**35**	**207**	**14**
Total fair value	**169**	**35**	**230**	**246**

	Derivative assets		Derivative liabilities	
December 31, 2022 ($ in millions)	**Current in "Other current assets"**	**Non-current in "Other non-current assets"**	**Current in "Other current liabilities"**	**Non-current in "Other non-current liabilities"**
Derivatives designated as hedging instruments:				
Foreign exchange contracts	—	—	4	4
Interest rate contracts	—	—	5	57
Cross-currency interest rate swaps	—	—	—	288
Other	15	—	—	—
Total	**15**	**—**	**9**	**349**
Derivatives not designated as hedging instruments:				
Foreign exchange contracts	140	21	80	5
Commodity contracts	13	—	12	—
Interest rate contracts	5	—	3	—
Embedded foreign exchange derivatives	11	6	17	13
Total	**169**	**27**	**112**	**18**
Total fair value	**184**	**27**	**121**	**367**

Close-out netting agreements provide for the termination, valuation and net settlement of some or all outstanding transactions between two counterparties on the occurrence of one or more pre-defined trigger events.

Although the Company is party to close-out netting agreements with most derivative counterparties, the fair values in the tables above and in the Consolidated Balance Sheets at December 31, 2023 and 2022, have been presented on a gross basis.

The Company's netting agreements and other similar arrangements allow net settlements under certain conditions. At December 31, 2023 and 2022, information related to these offsetting arrangements was as follows:

December 31, 2023 ($ in millions)					
Type of agreement or similar arrangement	Gross amount of recognized assets	Derivative liabilities eligible for set-off in case of default	Cash collateral received	Non-cash collateral received	Net asset exposure
Derivatives	176	(111)	—	—	65
Total	**176**	**(111)**	**—**	**—**	**65**

December 31, 2023 ($ in millions)					
Type of agreement or similar arrangement	Gross amount of recognized liabilities	Derivative liabilities eligible for set-off in case of default	Cash collateral pledged	Non-cash collateral pledged	Net liability exposure
Derivatives	445	(111)	—	—	334
Total	**445**	**(111)**	**—**	**—**	**334**

December 31, 2022 ($ in millions)					
Type of agreement or similar arrangement	Gross amount of recognized assets	Derivative liabilities eligible for set-off in case of default	Cash collateral received	Non-cash collateral received	Net asset exposure
Derivatives	194	(96)	—	—	98
Total	**194**	**(96)**	**—**	**—**	**98**

December 31, 2022 ($ in millions)					
Type of agreement or similar arrangement	Gross amount of recognized liabilities	Derivative liabilities eligible for set-off in case of default	Cash collateral pledged	Non-cash collateral pledged	Net liability exposure
Derivatives	458	(96)	—	—	362
Total	**458**	**(96)**	**—**	**—**	**362**

Note 7 Fair values

Recurring fair value measures

The fair values of financial assets and liabilities measured at fair value on a recurring basis were as follows:

December 31, 2023 ($ in millions)	Level 1	Level 2	Level 3	Total fair value
Assets				
Securities in "Marketable securities and short-term investments":				
Equity securities	—	1,282	—	**1,282**
Debt securities—U.S. government obligations	183	—	—	**183**
Derivative assets—current in "Other current assets"	—	169	—	**169**
Derivative assets—non-current in "Other non-current assets"	—	35	—	**35**
Total	**183**	**1,486**	**—**	**1,669**
Liabilities				
Derivative liabilities—current in "Other current liabilities"	—	230	—	**230**
Derivative liabilities—non-current in "Other non-current liabilities"	—	246	—	**246**
Total	**—**	**476**	**—**	**476**

December 31, 2022 ($ in millions)	Level 1	Level 2	Level 3	Total fair value
Assets				
Securities in "Marketable securities and short-term investments":				
Equity securities	—	355	—	**355**
Debt securities—U.S. government obligations	255	—	—	**255**
Debt securities—Other government obligations	—	58	—	**58**
Debt securities—Corporate	—	57	—	**57**
Derivative assets—current in "Other current assets"	—	184	—	**184**
Derivative assets—non-current in "Other non-current assets"	—	27	—	**27**
Total	**255**	**681**	**—**	**936**
Liabilities				
Derivative liabilities—current in "Other current liabilities"	—	121	—	**121**
Derivative liabilities—non-current in "Other non-current liabilities"	—	367	—	**367**
Total	**—**	**488**	**—**	**488**

During 2023, 2022 and 2021, there have been no reclassifications for any financial assets or liabilities between Level 1 and Level 2.

The Company uses the following methods and assumptions in estimating fair values of financial assets and liabilities measured at fair value on a recurring basis:

- Securities in "Marketable securities and short-term investments": If quoted market prices in active markets for identical assets are available, these are considered Level 1 inputs; however, when markets are not active, these inputs are considered Level 2. If such quoted market prices are not available, fair value is determined using market prices for similar assets or present value techniques, applying an appropriate risk-free interest rate adjusted for non-performance risk. The inputs used in present value techniques are observable and fall into the Level 2 category.
- Derivatives: The fair values of derivative instruments are determined using quoted prices of identical instruments from an active market, if available (Level 1 inputs). If quoted prices are not available, price quotes for similar instruments, appropriately adjusted, or present value techniques, based on available market data, or option pricing models are used. The fair values obtained using price quotes for similar instruments or valuation techniques represent a Level 2 input unless significant unobservable inputs are used.

Non-recurring fair value measures

There were no significant non-recurring fair value measurements during the years ended 2023, 2022 and 2021.

Disclosure about financial instruments carried on a cost basis

The fair values of financial instruments carried on a cost basis were as follows:

December 31, 2023 ($ in millions)	Carrying value	Level 1	Level 2	Level 3	Total fair value
Assets					
Cash and equivalents (excluding securities with original maturities up to 3 months):					
Cash	1,431	1,431	—	—	**1,431**
Time deposits	2,460	—	2,460	—	**2,460**
Restricted cash	18	18	—	—	**18**
Marketable securities and short-term investments (excluding securities):					
Time deposits	463	—	463	—	**463**
Liabilities					
Short-term debt and current maturities of long-term debt (excluding finance lease obligations)	2,576	2,521	55	—	**2,576**
Long-term debt (excluding finance lease obligations)	5,060	5,096	5	—	**5,101**

December 31, 2022 ($ in millions)	Carrying value	Level 1	Level 2	Level 3	Total fair value
Assets					
Cash and equivalents (excluding securities with original maturities up to 3 months):					
Cash	1,697	1,697	—	—	**1,697**
Time deposits	2,459	—	2,459	—	**2,459**
Restricted cash	18	18	—	—	**18**
Liabilities					
Short-term debt and current maturities of long-term debt (excluding finance lease obligations)	2,500	1,068	1,432	—	**2,500**
Long-term debt (excluding finance lease obligations)	4,976	4,813	30	—	**4,843**

The Company uses the following methods and assumptions in estimating fair values of financial instruments carried on a cost basis:

- Cash and equivalents (excluding securities with original maturities up to 3 months), Restricted cash and Marketable securities and short-term investments (excluding securities): The carrying amounts approximate the fair values as the items are short-term in nature or, for cash held in banks, are equal to the deposit amount.
- Short-term debt and current maturities of long-term debt (excluding finance lease obligations): Short-term debt includes commercial paper, bank borrowings and overdrafts. The carrying amounts of short-term debt and current maturities of long-term debt, excluding finance lease obligations, approximate their fair values.
- Long-term debt (excluding finance lease obligations): Fair values of bonds are determined using quoted market prices (Level 1 inputs), if available. For bonds without available quoted market prices and other long-term debt, the fair values are determined using a discounted cash flow methodology based upon borrowing rates of similar debt instruments and reflecting appropriate adjustments for non-performance risk (Level 2 inputs).

Note 8
Receivables, net and Contract assets and liabilities

Receivables, net consisted of the following:

December 31, ($ in millions)	2023	2022
Trade receivables	7,107	6,478
Other receivables	646	688
Allowance	(307)	(308)
Total	**7,446**	**6,858**

“Trade receivables” in the table above includes contractual retention amounts billed to customers of $104 million and $100 million at December 31, 2023 and 2022, respectively. Management expects that the substantial majority of related contracts will be completed and the substantial majority of the billed amounts retained by the customer will be collected. Of the retention amounts outstanding at December 31, 2023, 61 percent and 28 percent are expected to be collected in 2024 and 2025, respectively.

“Other receivables” in the table above consists of value added tax, claims, rental deposits and other non-trade receivables.

The reconciliation of changes in the allowance for doubtful accounts is as follows:

($ in millions)	2023	2022	2021
Balance at January 1,	**308**	**339**	**357**
Current-period provision for expected credit losses	47	37	33
Write-offs charged against the allowance	(48)	(48)	(37)
Exchange rate differences	—	(20)	(14)
Balance at December 31,	**307**	**308**	**339**

The following table provides information about Contract assets and Contract liabilities:

December 31, ($ in millions)	2023	2022	2021
Contract assets	1,090	954	990
Contract liabilities	2,844	2,216	1,894

Contract assets primarily relate to the Company's right to receive consideration for work completed but for which no invoice has been issued at the reporting date. Contract assets are transferred to receivables when rights to receive payment become unconditional. Management expects that the majority of the amounts will be collected within one year of the respective balance sheet date.

Contract liabilities primarily relate to up-front advances received on orders from customers as well as amounts invoiced to customers in excess of revenues recognized predominantly on long-term projects. Contract liabilities are reduced as work is performed and as revenues are recognized.

The significant changes in the Contract assets and Contract liabilities balances were as follows:

	2023		2022	
($ in millions)	Contract assets	Contract liabilities	Contract assets	Contract liabilities
Revenue recognized, which was included in the Contract liabilities balance at January 1, 2023/2022		(1,311)		(1,043)
Additions to Contract liabilities - excluding amounts recognized as revenue during the period		1,845		1,481
Receivables recognized that were included in the Contract assets balance at January 1, 2023/2022	(622)		(591)	

The Company considers its order backlog to represent its unsatisfied performance obligations. At December 31, 2023, the Company had unsatisfied performance obligations totaling $21,567 million and, of this amount, the Company expects to fulfill approximately 69 percent of the obligations in 2024, approximately 16 percent of the obligations in 2025 and the balance thereafter.

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Note 9
Inventories, net

Inventories, net consisted of the following:

December 31, ($ in millions)	2023	2022
Raw materials	2,546	2,626
Work in process	1,284	1,189
Finished goods	2,092	2,036
Advances to suppliers	227	177
Total	**6,149**	**6,028**

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Note 10
Property, plant and equipment, net

Property, plant and equipment, net consisted of the following:

December 31, ($ in millions)	2023	2022
Land and buildings	3,818	3,622
Machinery and equipment	5,847	5,495
Construction in progress	713	586
	10,378	**9,703**
Accumulated depreciation	(6,236)	(5,792)
Total	**4,142**	**3,911**

Assets under finance leases included in Property, plant and equipment, net were as follows:

December 31, ($ in millions)	2023	2022
Land and buildings	208	178
Machinery and equipment	95	135
	303	**313**
Accumulated depreciation	(137)	(135)
Total	**166**	**178**

In 2023, 2022 and 2021, depreciation, including depreciation of assets under finance leases, was $517 million, $531 million and $575 million, respectively. In 2023, 2022 and 2021, there were no significant impairments of property, plant or equipment.

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Note 11
Goodwill and intangible assets

The changes in “Goodwill” were as follows:

($ in millions)	Electrification	Motion	Process Automation	Robotics & Discrete Automation	Corporate and Other[3]	Total
Balance at January 1, 2022[1]	**4,196**	**2,117**	**1,613**	**2,280**	**276**	**10,482**
Goodwill acquired during the year[2]	16	9	—	—	204	**229**
Goodwill allocated to disposals	(2)	—	(6)	—	—	**(8)**
Exchange rate differences and other	(85)	(8)	(20)	(72)	(7)	**(192)**
Balance at December 31, 2022[1]	**4,125**	**2,118**	**1,587**	**2,208**	**473**	**10,511**
Goodwill acquired during the year[2]	41	38	—	49	14	**142**
Goodwill allocated to disposals	(181)	—	(12)	—	—	**(193)**
Exchange rate differences and other	45	3	8	45	—	**101**
Balance at December 31, 2023[1]	**4,030**	**2,159**	**1,583**	**2,302**	**487**	**10,561**

(1) At December 31, 2023 and 2022, and at January 1, 2022, the gross goodwill amounted to $10,833 million, $10,774 million and $10,760 million, respectively. The accumulated impairment charges amounted to $272 million, $263 million and $278 million, respectively, and related to the Robotics & Discrete Automation segment.

(2) Amount includes adjustments arising during the twelve-month measurement period subsequent to the respective acquisition date.

(3) Corporate and Other has been recast to include the E-mobility Division which, effective January 1, 2023, became a separate non-reportable operating segment. See Note 23 for details.

In 2023, goodwill allocated to disposals primarily relates to the divestment of the Power Conversion Division in July 2023, which prior to its divestment was reported in the Electrification operating segment.

Intangible assets, net consisted of the following:

	2023			2022		
December 31, ($ in millions)	Gross carrying amount	Accumu-lated amort-ization	Net carrying amount	Gross carrying amount	Accumu-lated amort-ization	Net carrying amount
Capitalized software for internal use	904	(775)	**129**	830	(720)	**110**
Capitalized software for sale	26	(26)	**—**	26	(26)	**—**
Intangibles other than software:						
Customer-related	1,632	(894)	**738**	1,743	(808)	**935**
Technology-related	1,034	(832)	**202**	997	(812)	**185**
Marketing-related	531	(400)	**131**	498	(347)	**151**
Other	56	(33)	**23**	55	(30)	**25**
Total	**4,183**	**(2,960)**	**1,223**	**4,149**	**(2,743)**	**1,406**

Additions to intangible assets other than goodwill consisted of the following:

($ in millions)	2023	2022
Capitalized software for internal use	70	53
Capitalized software for sale	—	—
Intangibles other than software:		
Customer-related	12	79
Technology-related	13	16
Marketing-related	35	20
Other	1	7
Total	131	175

There were no significant intangible assets acquired in business combinations in 2023 and 2022.

Amortization expense of intangible assets consisted of the following:

($ in millions)	2023	2022	2021
Capitalized software for internal use	44	52	66
Intangibles other than software	219	230	252
Total	**263**	**282**	**318**

In 2023, 2022 and 2021, impairment charges on intangible assets were not significant.

At December 31, 2023, future amortization expense of intangible assets is estimated to be:

($ in millions)	
2024	253
2025	198
2026	177
2027	163
2028	140
Thereafter	292
Total	**1,223**

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Note 12
Debt

The Company's total debt at December 31, 2023 and 2022, amounted to $7,828 million and $7,678 million, respectively.

Short-term debt and current maturities of long-term debt

Short-term debt and current maturities of long-term debt consisted of the following:

December 31, ($ in millions)	2023	2022
Short-term debt (weighted-average interest rate of 5.1% and 1.9%, respectively)	87	1,448
Current maturities of long-term debt (weighted-average nominal interest rate of 1.5% and 0.5%, respectively)	2,520	1,087
Total	**2,607**	**2,535**

Short-term debt primarily represents short-term loans from various banks and issued commercial paper.

At December 31, 2023, the Company had two commercial paper programs in place: a $2 billion Euro-commercial paper program for the issuance of commercial paper in a variety of currencies, and a $2 billion commercial paper program for the private placement of U.S. dollar denominated commercial paper in the United States. At December 31, 2022, $1,383 million was outstanding under the $2 billion Euro-commercial paper program. No amount was outstanding under this program at December 31, 2023, and at both December 31, 2023 and 2022, no amount was outstanding under the $2 billion program in the United States.

In December 2019, the Company replaced its previous multicurrency revolving credit facility with a new $2 billion multicurrency revolving credit facility maturing in 2024. In 2021, the Company exercised its option to extend the maturity of this facility to 2026. The facility is for general corporate purposes. In 2023, the Company amended and restated its facility for the purpose of addressing the discontinuation of LIBOR. Under the amended and restated credit facility, interest costs on drawings under the facility (i) in USD are referenced to CME Term SOFR; (ii) in CHF and GBP are referenced to overnight SARON and SONIA, respectively; and (iii) in Euro are referenced to EURIBOR, subject to applicable credit adjustment spreads (for only (i) and (ii) above), plus a margin of 0.175 percent, while commitment fees (payable on the unused portion of the facility) amount to 35 percent of the margin, which represents commitment fees of 0.06125 percent per annum. Utilization fees, payable on drawings, amount to 0.075 percent per annum on drawings up to one-third of the facility, 0.15 percent per annum on drawings in excess of one-third but less than or equal to two-thirds of the facility, and 0.30 percent per annum on drawings over two-thirds of the facility. The facility contains cross-default clauses whereby an event of default would occur if the Company were to default on indebtedness as defined in the facility, at or above a specified threshold. No amount was drawn at December 31, 2023 and 2022, under this facility.

In November 2023, the Company signed a financing agreement of up to EUR 500 million with the European Investment Bank (EIB), the lending arm of the European Union, for financing research and development within the Electrification operating segment. The availability period under the agreement ends in May 2025. The applicable interest rate and other relevant borrowing terms are determined on a case-by-case basis at the time of drawdown. At December 31, 2023, no amount was drawn under this agreement.

Long-term debt

The Company raises long-term debt in various currencies, maturities and on various interest rate terms. For certain of its debt obligations, the Company utilizes derivative instruments to modify its interest rate exposure. In particular, the Company uses interest rate swaps to effectively convert certain fixed-rate long-term debt into floating rate obligations. For certain non-U.S. dollar denominated debt, the Company utilizes cross-currency interest rate swaps to effectively convert the debt into a U.S. dollar obligation. The carrying value of debt, designated as being hedged by fair value hedges, is adjusted for changes in the fair value of the risk component of the debt being hedged.

The following table summarizes the Company's long-term debt considering the effect of interest rate and cross-currency interest rate swaps. Consequently, a fixed-rate debt subject to a fixed-to-floating interest rate swap is included as a floating rate debt in the table below:

	2023			2022		
December 31, ($ in millions, except % data)	**Balance**	**Nominal rate**	**Effective rate**	**Balance**	**Nominal rate**	**Effective rate**
Floating rate	2,907	1.3%	4.8%	3,459	0.4%	2.8%
Fixed rate	4,834	2.6%	2.7%	2,771	2.2%	2.2%
	7,741			**6,230**		
Current portion of long-term debt	(2,520)	1.5%	3.7%	(1,087)	0.5%	1.5%
Total	**5,221**			**5,143**		

At December 31, 2023, the principal amounts of long-term debt repayable (excluding finance lease obligations) at maturity were as follows:

($ in millions)	
2024	2,507
2025	187
2026	389
2027	1,062
2028	562
Thereafter	3,037
Total	**7,744**

Details of outstanding bonds were as follows:

	2023				2022			
December 31, (in millions)	Nominal outstanding		Carrying value[1]		Nominal outstanding		Carrying value[1]	
Bonds:								
0.625% EUR Instruments, due 2023					EUR	700	$	742
0% CHF Bonds, due 2023					CHF	275	$	298
0.625% EUR Instruments, due 2024	EUR	700	$	768	EUR	700	$	720
Floating Rate EUR Instruments, due 2024	EUR	500	$	554	EUR	500	$	536
0.75% EUR Instruments, due 2024	EUR	750	$	819	EUR	750	$	769
0.3% CHF Bonds, due 2024	CHF	280	$	335	CHF	280	$	303
2.1% CHF Bonds, due 2025	CHF	150	$	179	CHF	150	$	162
1.965% CHF Bonds, due 2026	CHF	325	$	387				
3.25% EUR Instruments, due 2027	EUR	500	$	551				
0.75% CHF Bonds, due 2027	CHF	425	$	507	CHF	425	$	460
3.8% USD Notes, due 2028[2]	USD	383	$	382	USD	383	$	381
1.9775% CHF Bonds, due 2028	CHF	150	$	179				
1.0% CHF Bonds, due 2029	CHF	170	$	203	CHF	170	$	184
0% EUR Instruments, due 2030	EUR	800	$	749	EUR	800	$	677
2.375% CHF Bonds, due 2030	CHF	150	$	178	CHF	150	$	162
3.375% EUR Instruments, due 2031	EUR	750	$	818				
2.1125% CHF Bonds, due 2033	CHF	275	$	327				
4.375% USD Notes, due 2042[2]	USD	609	$	591	USD	609	$	590
Total			**$**	**7,527**			**$**	**5,984**

(1) USD carrying values include unamortized debt issuance costs, bond discounts or premiums, as well as adjustments for fair value hedge accounting, where appropriate.

(2) Prior to completing a cash tender offer in 2020, the original principal amount outstanding, on each of the 3.8% USD Notes, due 2028, and the 4.375% USD Notes, due 2042, was $750 million.

During 2023, the Company repaid at maturity its 0.625% EUR 700 million Instruments, which paid interest annually in arrears at a fixed rate of 0.625 percent per annum and its CHF 275 million zero interest Bonds.

The following EUR Instruments are both due in 2024: (i) EUR 700 million, paying interest annually in arrears at a fixed rate of 0.625 percent per annum, and (ii) EUR 500 million floating rate notes, paying interest quarterly in arrears at a variable rate of 0.7 percentage points above the 3-month EURIBOR, subject to a minimum rate of interest of zero percent. The Company may redeem the EUR 700 million Instruments prior to maturity at the greater of (i) 100 percent of the principal amount of the notes to be redeemed and (ii) the sum of the present values of remaining scheduled payments of principal and interest (excluding interest accrued to the redemption date) discounted to the redemption date at a rate defined in the note terms, plus interest accrued at the redemption date. Interest rate swaps have been used to modify the characteristics of the EUR 700 million Instruments, due 2024. After considering the impact of these interest rate swaps, the EUR 700 million Instruments, effectively become floating rate obligations.

The 0.75% EUR Instruments, due 2024, pay interest annually in arrears at a fixed rate of 0.75 percent per annum. The Company may redeem these notes up to three months prior to maturity (Par call date), at the greater of (i) 100 percent of the principal amount of the notes to be redeemed and (ii) the sum of the present values of remaining scheduled payments of principal and interest (excluding interest accrued to the redemption date) discounted to the redemption date at a rate defined in the note terms, plus interest accrued at the redemption date. The Company may redeem these instruments, after the Par call date at 100 percent of the principal amount of the notes to be redeemed. The Company entered into interest rate swaps to modify the characteristics of these bonds. After considering the impact of such swaps, these notes effectively become floating rate euro obligations and consequently have been shown as floating rate debt, in the table of long-term debt above.

The 0.3% CHF Bonds, due 2024, and 1.0% CHF Bonds, due 2029, each pay interest annually in arrears. The Company may redeem these bonds, one month prior to maturity in the case of the 2024 Bonds and three months prior to maturity in the case of the 2029 Bonds, in whole but not in part, at par plus accrued interest. Further, the Company has the option to redeem these instruments prior to maturity, in whole but not in part, at par plus accrued interest, if 85 percent or more of the aggregate principal amount of the relevant bond issue have been redeemed or purchased and cancelled at the time of the option exercise notice.

The CHF 150 million 2.1% Bonds, due 2025, and the CHF 150 million 2.375% Bonds, due 2030, both pay interest annually in arrears. The Company may redeem these bonds, three months prior to maturity, in whole but not in part, at par plus accrued interest. Further, the Company has the option to redeem these instruments prior to maturity, in whole but not in part, at par plus accrued interest, if 85 percent or more of the aggregate principal amount of the relevant bond issue has been redeemed or purchased and cancelled at the time of the option exercise notice.

The CHF 425 million 0.75% Bonds, due 2027, pay interest annually in arrears. The Company may redeem the Bonds, one month prior to maturity, in whole but not in part, at par plus accrued interest. Further, the Company has the option to redeem these instruments prior to maturity, in whole but not in part, at par plus accrued interest, if 85 percent or more of the aggregate principal amount have been redeemed or purchased and cancelled at the time of the option exercise notice.

The 3.8% USD Notes, due 2028, were issued in April 2018 and pay interest semi-annually in arrears. During 2020 by way of a cash tender offer, the Company redeemed $367 million of the original $750 million 3.8% USD Notes, due 2028, issued. The Company may redeem the remaining principal outstanding of the 2028 Notes up to three months prior to their maturity date, in whole or in part, at the greater of (i) 100 percent of the principal amount of the notes to be redeemed and (ii) the sum of the present values of remaining scheduled payments of principal and interest (excluding interest accrued to the redemption date) discounted to the redemption date at a rate defined in the Notes terms, plus interest accrued at the redemption date. On or after January 3, 2028 (three months prior to their maturity date), the Company may also redeem the 2028 Notes, in whole or in part, at any time at a redemption price equal to 100 percent of the principal amount of the notes to be redeemed plus unpaid accrued interest to, but excluding, the redemption date. These notes, registered with the U.S. Securities and Exchange Commission, were issued by ABB Finance (USA) Inc., a 100 percent owned finance subsidiary, and are fully and unconditionally guaranteed by ABB Ltd. There are no significant restrictions on the ability of the parent company to obtain funds from its subsidiaries by dividend or loan. In reliance on Rule 13-01 of Regulation S-X, the separate financial statements of ABB Finance (USA) Inc. are not provided.

The 0% EUR Instruments, due 2030, do not pay interest and have the same early redemption terms as the 0.75% EUR Instruments above. Cross-currency interest rate swaps have been used to modify the characteristics of these instruments. After considering the impact of these cross-currency interest rate swaps, the Company effectively has a floating rate U.S. dollar obligation.

The 4.375% USD Notes, due 2042, pay interest semi-annually in arrears at a fixed annual rate of 4.375 percent. During 2020, by way of a cash tender offer, the Company redeemed $141 million of the original $750 million 4.375% USD Notes, due 2042, issued. The Company may redeem these notes prior to maturity, in whole or in part, at the greater of (i) 100 percent of the principal amount of the notes to be redeemed and (ii) the sum of the present values of remaining scheduled payments of principal and interest (excluding interest accrued to the redemption date) discounted to the redemption date at a rate defined in the note terms, plus interest accrued at the redemption date. These notes, registered with the U.S. Securities and Exchange Commission, were issued by ABB Finance (USA) Inc., a 100 percent owned finance subsidiary, and are fully and unconditionally guaranteed by ABB Ltd. There are no significant restrictions on the ability of the parent company to obtain funds from its subsidiaries by dividend or loan. In reliance on Rule 13-01 of Regulation S-X, the separate financial statements of ABB Finance (USA) Inc. are not provided.

In 2023, the Company issued the following EUR Instruments: (i) EUR 500 million 3.25% Instruments, due 2027, and (ii) EUR 750 million 3.375% Instruments, due 2031, both paying interest annually in arrears. The Company may redeem the EUR 500 million Instruments one month prior to maturity (Par call date) and the EUR 750 million Instruments three months prior to maturity (Par call date), at the greater of (i) 100 percent of the principal amount of the notes to be redeemed and (ii) the sum of the present values of remaining scheduled payments of principal and interest (excluding interest accrued to the redemption date) discounted to the redemption date at a rate defined in the note terms, plus interest accrued at the redemption date. The Company may redeem these instruments, after the Par call date, at 100 percent of the principal amount of the notes to be redeemed. The aggregate net proceeds of these EUR Instruments, after discount and fees, amounted to EUR 1,235 million (equivalent to approximately $1,338 million on date of issuance).

Also in 2023, the Company issued the following CHF bonds: (i) CHF 325 million 1.965% Bonds, due 2026, (ii) CHF 150 million 1.9775% Bonds, due 2028, and (iii) CHF 275 million 2.1125% Bonds, due 2033, all paying interest annually in arrears and have the same early redemption terms as the CHF 150 million 2.1% Bonds above. The aggregate net proceeds of these CHF Bonds, after fees, amounted to CHF 748 million (equivalent to approximately $825 million on date of issuance).

The Company's various debt instruments contain cross-default clauses which would allow the bondholders to demand repayment if the Company were to default on any borrowing at or above a specified threshold. Furthermore, all such bonds constitute unsecured obligations of the Company and rank pari passu with other debt obligations.

In addition to the bonds described above, included in long-term debt at December 31, 2023 and 2022, are finance lease obligations, bank borrowings of subsidiaries and other long-term debt, none of which is individually significant.

Note 13
Other provisions, other current liabilities and other non-current liabilities

Other provisions consisted of the following:

December 31, ($ in millions)	2023	2022
Contract-related provisions	523	615
Restructuring and restructuring-related provisions	187	145
Provision for insurance-related reserves	183	171
Provisions for contractual penalties and compliance and litigation matters	88	49
Other	220	191
Total	**1,201**	**1,171**

Other current liabilities consisted of the following:

December 31, ($ in millions)	2023	2022
Employee-related liabilities	1,566	1,490
Accrued expenses	788	872
Income taxes payable and other income tax related liabilities	668	391
Non-trade payables	631	681
Accrued customer rebates	514	315
Other tax liabilities	360	285
Derivative liabilities (see Note 6)	230	121
Accrued interest	105	38
Other	184	262
Total	**5,046**	**4,455**

Other non-current liabilities consisted of the following:

December 31, ($ in millions)	2023	2022
Income tax related liabilities	813	1,287
Derivative liabilities (see Note 6)	246	367
Provisions for contractual penalties and compliance and litigation matters	160	67
Other	329	384
Total	**1,548**	**2,105**

Note 14
Leases

The Company's lease obligations primarily relate to real estate, machinery and equipment. The components of lease expense were as follows:

	Land and buildings			Machinery and equipment			Total		
($ in millions)	**2023**	**2022**	**2021**	**2023**	**2022**	**2021**	**2023**	**2022**	**2021**
Operating lease cost	221	217	240	73	71	73	**294**	**288**	**313**
Finance lease cost	15	15	17	15	22	20	**30**	**37**	**37**
Short-term lease cost	16	20	26	10	18	14	**26**	**38**	**40**
Sub-lease income	(20)	(18)	(24)	—	(1)	(1)	**(20)**	**(19)**	**(25)**
Total lease expense	**232**	**234**	**259**	**98**	**110**	**106**	**330**	**344**	**365**

The following table presents supplemental cash flow information related to leases:

	Land and buildings			Machinery and equipment			Total		
($ in millions)	**2023**	**2022**	**2021**	**2023**	**2022**	**2021**	**2023**	**2022**	**2021**
Operating leases:									
Cash paid under operating cash flows	220	200	223	73	66	68	**293**	**266**	**291**
Right-of-use assets obtained in exchange for new liabilities	198	285	267	92	50	86	**290**	**335**	**353**

In 2023, 2022 and 2021 the cash flow amounts under finance leases were not significant.

At December 31, 2023, the future net minimum lease payments for operating and finance leases and the related present value of the net minimum lease payments consisted of the following:

	Operating Leases		Finance Leases	
($ in millions)	**Land and buildings**	**Machinery and equipment**	**Land and buildings**	**Machinery and equipment**
2024	208	65	21	16
2025	177	49	21	12
2026	143	27	18	6
2027	100	11	18	5
2028	68	2	18	1
Thereafter	158	4	92	—
Total minimum lease payments	**854**	**158**	**188**	**40**
Difference between undiscounted cash flows and discounted cash flows	(89)	(8)	(34)	(2)
Present value of minimum lease payments	**765**	**150**	**154**	**38**

The following table presents certain information related to lease terms and discount rates:

	Land and buildings			Machinery and equipment		
	2023	**2022**	**2021**	**2023**	**2022**	**2021**
Operating leases:						
Weighted-average remaining term (months)	71	73	73	35	31	30
Weighted-average discount rate	3.7%	3.3%	2.6%	4.3%	1.9%	1.9%
Finance leases:						
Weighted-average remaining term (months)	128	135	100	36	33	40
Weighted-average discount rate	4.9%	5.5%	7.7%	3.7%	2.3%	1.8%

The present value of minimum finance lease payments included in Short-term debt and current maturities of long-term debt and Long-term debt in the Consolidated Balance Sheets at December 31, 2023, amounts to $31 million and $161 million, respectively, and at December 31, 2022, amounts to $35 million and $167 million, respectively.

Note 15
Commitments and contingencies

Contingencies—Regulatory, Compliance and Legal

Regulatory

Based on findings during an internal investigation, the Company self-reported to the Securities and Exchange Commission (SEC) and the Department of Justice (DoJ), in the United States, to the Special Investigating Unit (SIU) and the National Prosecuting Authority (NPA) in South Africa, as well as to various authorities in other countries, potential suspect payments and other compliance concerns in connection with some of the Company's dealings with Eskom and related persons. Many of those parties have expressed an interest in, or commenced an investigation into, these matters and the Company is cooperating fully with them. The Company paid $104 million to Eskom in December 2020 as part of a full and final settlement with Eskom and the SIU relating to improper payments and other compliance issues associated with the Controls and Instrumentation Contract, and its Variation Orders for Units 1 and 2 at Kusile. The Company made a provision of approximately $325 million, which was recorded in Other income (expense), net, during the third quarter of 2022. In December 2022, the Company settled with the SEC and DoJ as well as the authorities in South Africa and Switzerland. The matter is still pending with the authorities in Germany, but the Company does not believe that it will need to record any additional provisions for this matter.

General

The Company is aware of proceedings, or the threat of proceedings, against it and others in respect of private claims by customers and other third parties with regard to certain actual or alleged anticompetitive practices. Also, the Company is subject to other claims and legal proceedings, as well as investigations carried out by various law enforcement authorities. With respect to the above-mentioned claims, regulatory matters, and any related proceedings, the Company will bear the related costs, including costs necessary to resolve them.

Liabilities recognized

At December 31, 2023 and 2022, the Company had aggregate liabilities of $101 million and $86 million, respectively, included in Other provisions and Other non-current liabilities, for the above regulatory, compliance and legal contingencies, and none of the individual liabilities recognized was significant. As it is not possible to make an informed judgment on, or reasonably predict, the outcome of certain matters and as it is not possible, based on information currently available to management, to estimate the maximum potential liability on other matters, there could be adverse outcomes beyond the amounts accrued.

Guarantees

General

The following table provides quantitative data regarding the Company's third-party guarantees. The maximum potential payments represent a "worst-case scenario", and do not reflect management's expected outcomes.

	Maximum potential payments[1]	
December 31, ($ in millions)	**2023**	**2022**
Performance guarantees	3,451	4,300
Financial guarantees	94	96
Total	**3,545**	**4,396**

(1) Maximum potential payments include amounts in both continuing and discontinued operations.

The carrying amount of liabilities recorded in the Consolidated Balance Sheets reflects the Company's best estimate of future payments, which it may incur as part of fulfilling its guarantee obligations. In respect of the above guarantees, the carrying amounts of liabilities at December 31, 2023 and 2022, were not significant.

The Company is party to various guarantees providing financial or performance assurances to certain third parties. These guarantees, which have various maturities up to 2032, mainly consist of performance guarantees whereby (i) the Company guarantees the performance of a third party's product or service according to the terms of a contract and (ii) as member of a consortium/joint venture that includes third parties, the Company guarantees not only its own performance but also the work of third parties. Such guarantees may include guarantees that a project will be completed within a specified time. If the third party does not fulfill the obligation, the Company will compensate the guaranteed party in cash or in kind. The original maturity dates for the majority of these performance guarantees range from one to ten years.

In conjunction with the divestment of the high-voltage cable and cables accessories businesses, the Company has entered into various performance guarantees with other parties with respect to certain liabilities of the divested business. At December 31, 2023 and 2022, the maximum potential payable under these guarantees amounts to $874 million and $843 million, respectively, and these guarantees have various maturities ranging from five to ten years.

The Company retained obligations for financial and performance guarantees related to the sale of the Power Grids business (see Note 3 for details). At both December 31, 2023 and 2022, the performance and financial guarantees have been fully indemnified by Hitachi. These guarantees, which have various maturities up to 2032, primarily consist of bank guarantees, standby letters of credit, business performance guarantees and other trade-related guarantees, the majority of which have original maturity dates ranging from one to ten years. The maximum amount payable under these guarantees at December 31, 2023 and 2022, is approximately $2.2 billion and $3.0 billion, respectively. On completing the sale of the Company's remaining 19.9 percent interest in Hitachi Energy Ltd. to Hitachi in 2022, the Company also settled certain existing indemnification guarantees that were due to be settled concurrent with such transaction. As a result, in 2022, the Company recorded $136 million of cash outflows for the settlement of these liabilities (recorded in discontinued operations).

Commercial commitments

In addition, in the normal course of bidding for and executing certain projects, the Company has entered into standby letters of credit, bid/performance bonds and surety bonds (collectively "performance bonds") with various financial institutions. Customers can draw on such performance bonds in the event that the Company does not fulfill its contractual obligations. The Company would then have an obligation to reimburse the financial institution for amounts paid under the performance bonds. At December 31, 2023 and 2022, the total outstanding performance bonds aggregated to $3.1 billion and $2.9 billion, respectively. There have been no significant amounts reimbursed to financial institutions under these types of arrangements in 2023 and 2022.

Product and order-related contingencies

The Company calculates its provision for product warranties based on historical claims experience and specific review of certain contracts.

The reconciliation of the Provisions for warranties, including guarantees of product performance, was as follows:

($ in millions)	**2023**	**2022**	**2021**
Balance at January 1,	**1,028**	**1,005**	**1,035**
Net change in warranties due to acquisitions, divestments and spin-offs	—	(24)	1
Claims paid in cash or in kind	(171)	(157)	(222)
Net increase in provision for changes in estimates, warranties issued and warranties expired	327	252	226
Exchange rate differences	26	(48)	(35)
Balance at December 31,	**1,210**	**1,028**	**1,005**

Related party transactions

The Company conducts business with certain companies where members of the Company's Board of Directors or Executive Committee act, or in recent years have acted, as directors or senior executives. The Company's Board of Directors has determined that the Company's business relationships with those companies do not constitute material business relationships. This determination was made in accordance with the Company's related party transaction policy which was prepared based on the Swiss Code of Best Practice and the independence criteria set forth in the corporate governance rules of the New York Stock Exchange.

Note 16
Income taxes

Income tax expense consisted of the following:

($ in millions)	2023	2022	2021
Current taxes	955	1,101	1,346
Deferred taxes	(25)	(344)	(289)
Income tax expense allocated to continuing operations	**930**	**757**	**1,057**
Income tax benefit allocated to discontinued operations	**(6)**	**(5)**	**(1)**

Income tax expense from continuing operations is reconciled below from the Company's weighted-average global tax rate (rather than from the Swiss domestic statutory tax rate) as the parent company of the ABB Group, ABB Ltd, is domiciled in Switzerland and income generated in jurisdictions outside of Switzerland (hereafter "foreign jurisdictions") which has already been subject to corporate income tax in those foreign jurisdictions is, to a large extent, tax exempt in Switzerland. There is no requirement in Switzerland for any parent company of a group to file a tax return of the consolidated group determining domestic and foreign pre-tax income. As the Company's consolidated income from continuing operations is predominantly earned outside of Switzerland, the weighted-average global tax rate of the Company results from enacted corporate income tax rates in foreign jurisdictions.

The reconciliation of Income tax expense from continuing operations at the weighted-average tax rate to the effective tax rate is as follows:

($ in millions, except % data)	2023	2022	2021
Income from continuing operations before income taxes	**4,778**	**3,394**	**5,787**
Weighted-average global tax rate	**22.3%**	**23.6%**	**23.7%**
Income taxes at weighted-average tax rate	1,065	800	1,371
Items taxed at rates other than the weighted-average tax rate	33	127	176
Unrecognized tax benefits	(207)	(83)	151
Changes in valuation allowance, net	9	(195)	(95)
Effects of changes in tax laws and enacted tax rates	(3)	(19)	1
Non-deductible / non-taxable items	43	97	(542)
Other, net	(10)	30	(5)
Income tax expense from continuing operations	**930**	**757**	**1,057**
Effective tax rate for the year	**19.5%**	**22.3%**	**18.3%**

The allocation of consolidated income from continuing operations, which is predominantly earned outside of Switzerland, impacts the "Weighted-average global tax rate".

In 2023 and 2022, "Items taxed at rates other than the weighted-average tax rate" included $30 million and $53 million, respectively, for dividends received in holding entities which could not fully benefit from the participation exemption, while in 2021, this included $107 million for certain amounts related to the divestment of the Dodge business.

In 2023, "Changes in valuation allowance, net" included $57 million of negative impacts from business performance in Europe, partially offset with positive impacts from changes in certain outlooks related to business performance in the Americas of $13 million and Europe of $22 million. In 2022, this amount included positive impacts from changes in certain outlooks in Asia of $22 million, Europe of $23 million and the Americas of $208 million, offset by negative impacts from other changes in certain outlooks in Europe of $55 million. In 2021, the amount included positive impacts from changes in certain outlooks in Europe of $82 million.

In 2023 and 2021, "Effects of changes in tax laws and enacted tax rates" were not significant while in 2022, this amount primarily reflects the impact of changes in certain tax rates in Europe for $25 million.

In 2023, “Non-deductible / non-taxable items” reflects an additional tax impact of $24 million related to the sale of the Power Conversion Division. In 2022, this amount includes a net tax impact of $65 million for the non-deductible regulatory penalties in connection with the Kusile project offset partially by the impact of the non-taxable gain from the sale of the remaining investment in Hitachi Energy. In 2021, this includes $567 million in reported income tax benefits primarily due to impacts of divestments and internal reorganizations where the reported net gain from sale of businesses exceeded the related taxable gain as well as the impact of a recognition of previously unrecognized outside basis differences. In all periods, the amounts reported also include other items that were deducted for financial accounting purposes but are typically not tax deductible, such as certain interest expense costs, local taxes on productive activities, disallowed amounts for meals and entertainment expenses and other similar items.

In 2023, “Unrecognized tax benefits” included a benefit of $206 million related to a favorable resolution of an uncertain tax matter in Asia relating to the divestment in 2020 of the Power Grids business. In 2022 and 2021, “Unrecognized tax benefits” in the table above included a net benefit of $95 million and a net cost of $150 million, respectively, related to the interpretation for tax law and double tax treaty agreements by competent tax authorities.

Deferred tax assets and liabilities consisted of the following:

December 31, ($ in millions)	2023	2022
Deferred tax assets:		
Unused tax losses and credits	544	462
Provisions and other accrued liabilities	839	756
Other current assets including receivables	76	100
Pension	284	283
Inventories	347	304
Intangible assets	1,121	1,154
Other	69	66
Total gross deferred tax asset	**3,280**	**3,125**
Valuation allowance	(1,070)	(1,000)
Total gross deferred tax asset, net of valuation allowance	**2,210**	**2,125**
Deferred tax liabilities:		
Property, plant and equipment	(243)	(232)
Intangible assets	(241)	(237)
Other assets	(142)	(91)
Pension	(317)	(318)
Other liabilities	(154)	(200)
Inventories	(66)	(44)
Unremitted earnings of subsidiaries	(335)	(336)
Total gross deferred tax liability	**(1,498)**	**(1,458)**
Net deferred tax asset (liability)	**712**	**667**
Included in:		
“Deferred taxes”—non-current assets	1,381	1,396
“Deferred taxes”—non-current liabilities	(669)	(729)
Net deferred tax asset (liability)	**712**	**667**

Certain entities have deferred tax assets related to net operating loss carry-forwards and other items. As recognition of these assets in certain entities did not meet the more likely than not criterion, valuation allowances have been recorded. “Unused tax losses and credits” at December 31, 2023 and 2022, in the table above, included $54 million and $80 million, respectively, for which the Company has established a valuation allowance as, due to limitations imposed by the relevant tax law, the Company determined that, more likely than not, such deferred tax assets would not be realized.

The valuation allowance at December 31, 2023, 2022 and 2021, was $1,070 million, $1,000 million and $1,263 million, respectively. In 2023, the change in valuation allowance was primarily due to movements in foreign exchange rates.

Certain amounts included in deferred tax assets for intangible assets result from intercompany transactions occurring at fair market value for which no corresponding accounting basis exists.

At December 31, 2023 and 2022, deferred tax liabilities totaling $335 million and $336 million, respectively, have been provided for withholding taxes, dividend distribution taxes or additional corporate income taxes (hereafter “withholding taxes”) on unremitted earnings which will be payable in foreign jurisdictions in the event of repatriation of the foreign earnings to Switzerland. Income which has been generated outside of Switzerland and has already been subject to corporate income tax in such foreign jurisdictions is, to a large extent, tax exempt in Switzerland and therefore, generally no or only limited Swiss income tax has to be provided for on the repatriated earnings of foreign subsidiaries.

Certain countries levy withholding taxes on dividend distributions and these taxes cannot always be fully reclaimed by the Company’s relevant subsidiary receiving the dividend, although the taxes have to be withheld and paid by the relevant subsidiary distributing such dividend. In 2023 and 2022, certain taxes arose in certain foreign jurisdictions for which the technical merits do not allow utilization of benefits. At December 31, 2023 and 2022, foreign subsidiary retained earnings which would be subject to withholding taxes upon distribution were approximately $50 million and $100 million, respectively. These earnings were considered as indefinitely reinvested, as these funds are used for financing current operations as well as business growth through working capital and capital expenditure in those countries and, consequently, no deferred tax liability was recorded.

At December 31, 2023, net operating loss carry-forwards of $2,119 million and tax credits of $56 million were available to reduce future income taxes of certain subsidiaries. Of these amounts, $842 million of operating loss carry-forwards and $56 million of tax credits will expire in varying amounts through 2046, while the remainder are available for carryforward indefinitely. The largest amount of these carry-forwards related to the Company’s Europe operations.

Unrecognized tax benefits consisted of the following:

($ in millions)	Unrecognized tax benefits	Penalties and interest related to unrecognized tax benefits	Total
Classification as unrecognized tax items on January 1, 2021	**1,298**	**192**	**1,490**
Net change due to acquisitions and divestments	16	(6)	**10**
Increase relating to prior year tax positions	240	58	**298**
Decrease relating to prior year tax positions	(42)	(3)	**(45)**
Increase relating to current year tax positions	98	7	**105**
Decrease due to settlements with tax authorities	(175)	(20)	**(195)**
Decrease as a result of the applicable statute of limitations	(72)	(22)	**(94)**
Exchange rate differences	(41)	(7)	**(48)**
Balance at December 31, 2021, which would, if recognized, affect the effective tax rate	**1,322**	**199**	**1,521**
Increase relating to prior year tax positions	26	36	**62**
Decrease relating to prior year tax positions	(98)	(12)	**(110)**
Increase relating to current year tax positions	80	4	**84**
Decrease due to settlements with tax authorities	(31)	(14)	**(45)**
Decrease as a result of the applicable statute of limitations	(71)	(23)	**(94)**
Exchange rate differences	(58)	(10)	**(68)**
Balance at December 31, 2022, which would, if recognized, affect the effective tax rate	**1,170**	**180**	**1,350**
Net change due to acquisitions and divestments	(9)	(1)	**(10)**
Increase relating to prior year tax positions	32	44	**76**
Decrease relating to prior year tax positions	(233)	(6)	**(239)**
Increase relating to current year tax positions	131	7	**138**
Decrease due to settlements with tax authorities	(82)	(13)	**(95)**
Decrease as a result of the applicable statute of limitations	(80)	(19)	**(99)**
Exchange rate differences	14	3	**17**
Balance at December 31, 2023, which would, if recognized, affect the effective tax rate	**943**	**195**	**1,138**

In 2023, 2022 and 2021, “Increase relating to current year tax positions” included a total of $76 million, $69 million and $72 million, respectively, in taxes related to the interpretation of tax law and double tax treaty agreements by competent tax authorities.

In 2023, “Increase relating to prior year tax positions” included $14 million, predominantly from Africa.

In 2022, “Increase relating to prior year tax positions” included $26 million predominantly from Asia and Europe.

In 2021, “Increase relating to prior year tax positions” included a total of $240 million related to the interpretation of tax law and double tax treaty agreements by competent tax authorities in Europe.

In 2023, “Decrease relating to prior year tax positions” included $206 million for a decrease in tax risk in Asia related to the divestment in 2020 of the Power Grids business.

In 2022, “Decrease relating to prior year tax positions” included $94 million for a decrease in tax risk assessments in Europe.

In 2021, “Decrease relating to prior year tax positions” of $42 million included $33 million related to tax risk assessments in Europe.

In 2023, “Decrease due to settlements with tax authorities” of $77 million related to tax risk assessments in Europe.

In 2021, “Decrease due to settlements with tax authorities” is predominantly related to tax assessments received in Europe, while in 2022, this amount is predominantly related to tax assessments received in Asia and Europe.

At December 31, 2023, the Company expected the resolution, within the next twelve months, of unrecognized tax benefits related to pending court cases amounting to $326 million for income taxes, penalties and interest. Otherwise, the Company had not identified any other significant changes which were considered reasonably possible to occur within the next twelve months.

At December 31, 2023, the earliest significant open tax years that remained subject to examination were the following:

Region	Year
Europe	2015
United States	2020
Rest of Americas	2019
China	2014
Rest of Asia, Middle East and Africa	2018

Note 17
Employee benefits

The Company operates defined benefit pension plans, defined contribution pension plans, and termination indemnity plans, in accordance with local regulations and practices. At December 31, 2023, the Company’s most significant defined benefit pension plans are in Switzerland as well as in Germany, the United Kingdom, and the United States. These plans cover a large portion of the Company’s employees and provide benefits to employees in the event of death, disability, retirement, or termination of employment. Certain of these plans are multi-employer plans. The Company also operates other postretirement benefit plans including postretirement health care benefits and other employee-related benefits for active employees including long-service award plans. The postretirement benefit plans are not significant. The measurement date used for the Company’s employee benefit plans is December 31. The funding policies of the Company’s plans are consistent with local government and tax requirements.

The Company recognizes in its Consolidated Balance Sheets the funded status of its defined benefit pension plans, postretirement plans and other employee-related benefits measured as the difference between the fair value of the plan assets and the benefit obligation.

Unless otherwise indicated, the following tables include amounts relating to both continuing and discontinued operations.

Obligations and funded status of the plans

The change in benefit obligation, change in fair value of plan assets, and funded status recognized in the Consolidated Balance Sheets were as follows:

	Defined pension benefits			
	Switzerland		International	
($ in millions)	**2023**	**2022**	**2023**	**2022**
Benefit obligation at January 1,	**2,457**	**3,434**	**3,572**	**5,115**
Service cost	40	50	30	38
Interest cost	48	13	166	87
Contributions by plan participants	34	34	11	10
Benefit payments	(134)	(96)	(236)	(234)
Settlements	(97)	(92)	(69)	(36)
Benefit obligations of businesses acquired (divested)	—	(328)	—	(2)
Actuarial (gain) loss	224	(478)	91	(1,075)
Plan amendments and other	1	—	5	(3)
Exchange rate differences	261	(80)	99	(328)
Benefit obligation at December 31,	**2,834**	**2,457**	**3,669**	**3,572**
Fair value of plan assets at January 1,	**3,183**	**4,113**	**3,172**	**4,463**
Actual return on plan assets	147	(310)	178	(789)
Contributions by employer	18	37	89	58
Contributions by plan participants	34	34	11	10
Benefit payments	(134)	(96)	(236)	(234)
Settlements	(97)	(92)	(69)	(36)
Plan assets of businesses acquired (divested)	—	(414)	1	(1)
Exchange rate differences	325	(89)	93	(299)
Fair value of plan assets at December 31,	**3,476**	**3,183**	**3,239**	**3,172**
Funded status — overfunded (underfunded)	**642**	**726**	**(430)**	**(400)**

The amounts recognized in Accumulated other comprehensive loss and Noncontrolling interests were:

	Defined pension benefits		
December 31, ($ in millions)	**2023**	**2022**	**2021**
Net actuarial (loss) gain	(1,439)	(1,183)	(1,540)
Prior service credit	39	56	72
Amount recognized in OCI[(1)] and NCI[(2)]	**(1,400)**	**(1,127)**	**(1,468)**
Taxes associated with amount recognized in OCI and NCI	311	266	352
Amount recognized in OCI[(1)] and NCI, net of tax[(3)]	**(1,089)**	**(861)**	**(1,116)**

(1) OCI represents Accumulated other comprehensive loss and, in addition, includes $14 million, $37 million and $28 million at December 31, 2023, 2022 and 2021, recognized for Other postretirement benefits.
(2) NCI represents Noncontrolling interests.
(3) NCI, net of tax, amounted to $0 million, $(1) million and $0 million at December 31, 2023, 2022 and 2021.

In addition, the following amounts were recognized in the Company's Consolidated Balance Sheets:

	Defined pension benefits			
	Switzerland		International	
December 31, ($ in millions)	**2023**	**2022**	**2023**	**2022**
Overfunded plans	642	726	137	189
Underfunded plans — current	—	—	(16)	(22)
Underfunded plans — non-current	—	—	(551)	(567)
Funded status — overfunded (underfunded)	**642**	**726**	**(430)**	**(400)**

December 31, ($ in millions)	**2023**	**2022**
Non-current assets		
Overfunded pension plans	779	915
Other employee-related benefits	1	1
Pension and other employee benefits	**780**	**916**

December 31, ($ in millions)	2023	2022
Current liabilities		
Underfunded pension plans	(16)	(22)
Underfunded other postretirement benefit plans	(3)	(6)
Other employee-related benefits	(14)	(10)
Pension and other employee benefits	**(33)**	**(38)**

December 31, ($ in millions)	2023	2022
Non-current liabilities		
Underfunded pension plans	(551)	(567)
Underfunded other postretirement benefit plans	(18)	(44)
Other employee-related benefits	(117)	(108)
Pension and other employee benefits	**(686)**	**(719)**

The accumulated benefit obligation (ABO) for all defined benefit pension plans was $6,427 million and $5,953 million at December 31, 2023 and 2022, respectively. The projected benefit obligation (PBO), ABO and fair value of plan assets, for pension plans with a PBO in excess of fair value of plan assets or ABO in excess of fair value of plan assets, was:

December 31,	PBO exceeds fair value of plan assets				ABO exceeds fair value of plan assets			
	Switzerland		International		Switzerland		International	
($ in millions)	2023	2022	2023	2022	2023	2022	2023	2022
PBO	—	9	2,315	2,274	—	9	2,311	2,274
ABO	—	9	2,257	2,222	—	9	2,253	2,222
Fair value of plan assets	—	9	1,749	1,689	—	9	1,745	1,689

Components of net periodic benefit cost

Net periodic benefit cost mainly consisted of the following:

	Defined pension benefits					
	Switzerland			International		
($ in millions)	2023	2022	2021	2023	2022	2021
Operational pension cost:						
Service cost	40	50	61	30	38	47
Operational pension cost	**40**	**50**	**61**	**30**	**38**	**47**
Non-operational pension cost (credit):						
Interest cost (credit)	48	13	(5)	166	87	72
Expected return on plan assets	(129)	(117)	(116)	(157)	(153)	(178)
Amortization of prior service cost (credit)	(8)	(9)	(9)	(2)	(2)	(2)
Amortization of net actuarial loss	—	—	—	52	58	67
Curtailments, settlements and special termination benefits	13	4	1	19	7	7
Non-operational pension cost (credit)[1]	**(76)**	**(109)**	**(129)**	**78**	**(3)**	**(34)**
Net periodic benefit cost (credit)	**(36)**	**(59)**	**(68)**	**108**	**35**	**13**

(1) Total Non-operational pension cost (credit) includes additional credits of $(19) million, $(4) million and $(3) million at December 31, 2023, 2022 and 2021, related to Other postretirement benefits.

The components of net periodic benefit cost other than the service cost component are included in Non-operational pension cost (credit) in the Consolidated Income Statements.

Assumptions

The following weighted-average assumptions were used to determine projected benefit obligations:

	Defined pension benefits			
	Switzerland		International	
December 31, (in %)	2023	2022	2023	2022
Discount rate	1.4	2.2	4.5	4.8
Rate of compensation increase	—	—	1.7	1.8
Rate of pension increase	—	—	1.6	1.8
Cash balance interest credit rate	2.0	2.0	3.2	2.7

For the Company's significant benefit plans, the discount rate used at each measurement date is set based on a high-quality corporate bond yield curve (derived based on bond universe information sourced from reputable third-party index and data providers and rating agencies) reflecting the timing, amount and currency of the future expected benefit payments for the respective plan. Consistent discount rates are used across all plans in each currency zone, based on the duration of the applicable plan(s) in that zone. For plans in the other countries, the discount rate is based on high quality corporate or government bond yields applicable in the respective currency, as appropriate at each measurement date with a duration broadly consistent with the respective plan's obligations.

The following weighted-average assumptions were used to determine the "Net periodic benefit cost":

	Defined pension benefits					
	Switzerland			International		
(in %)	2023	2022	2021	2023	2022	2021
Discount rate	2.0	0.7	—	4.8	2.1	1.6
Expected long-term rate of return on plan assets	4.0	3.3	3.0	5.0	3.7	4.0
Rate of compensation increase	—	—	—	1.8	1.5	1.0
Cash balance interest credit rate	2.0	1.3	1.0	2.7	2.1	2.1

The "Expected long-term rate of return on plan assets" is derived for each benefit plan by considering the expected future long-term return assumption for each individual asset class. A single long-term return assumption is then derived for each plan based upon the plan's target asset allocation.

Plan assets

The Company has pension plans in various countries with the majority of the Company's pension liabilities deriving from a limited number of these countries.

The pension plans are typically funded by regular contributions from employees and the Company. These plans are typically administered by boards of trustees (which include Company representatives) whose primary responsibilities include ensuring that the plans meet their liabilities through contributions and investment returns. The boards of trustees have the responsibility for making key investment strategy decisions within a risk-controlled framework.

The pension plan assets are invested in diversified portfolios that are managed by third-party asset managers, in accordance with local statutory regulations, pension plan rules and the respective plans' investment guidelines, as approved by the boards of trustees.

Plan assets are generally segregated from those of the Company and invested with the aim of meeting the respective plans' projected future pension liabilities. Plan assets are measured at fair value at the balance sheet date.

The boards of trustees manage the assets of the pension plans in a risk-controlled manner and assess the risks embedded in the pension plans through asset/liability management studies. Asset/liability management studies typically take place every three years. However, the risks of the plans are monitored on an ongoing basis.

The boards of trustees' investment goal is to maximize the long-term returns of plan assets within specified risk parameters, while considering the future liabilities and liquidity needs of the individual plans. Risk measures taken into account include the funding ratio of the plan, the likelihood of extraordinary cash contributions being required, the risk embedded in each individual asset class, and the plan asset portfolio as a whole.

The Company's global pension asset allocation is the result of the asset allocations of the individual plans, which are set by the respective boards of trustees. The target asset allocation of the Company's plans on a weighted-average basis is as follows:

	Target	
(in %)	Switzerland	International
Asset class		
Equity	13	15
Fixed income	56	68
Real estate	26	4
Other	5	13
Total	**100**	**100**

The actual asset allocations of the plans are in line with the target asset allocations.

Equity securities primarily include investments in large-cap and mid-cap publicly traded companies. Fixed income assets primarily include corporate bonds of companies from diverse industries and government bonds. Both fixed income and equity assets are invested either via funds or directly in segregated investment mandates, and include an allocation to emerging markets. Real estate consists primarily of investments in real estate in Switzerland held in the Swiss plans. The “Other” asset class includes investments in private equity, insurance contracts, cash, and reflects a variety of investment strategies.

Based on the above global asset allocation and the fair values of the plan assets, the expected long-term return on assets at December 31, 2023, is 4.6 percent. The Company and the local boards of trustees regularly review the investment performance of the asset classes and individual asset managers. Due to the diversified nature of the investments, the Company is of the opinion that no significant concentration of risks exists in its pension fund assets.

At December 31, 2023 and 2022, plan assets include ABB Ltd’s shares (as well as an insignificant amount of the Company’s debt instruments) with a total value of $9 million and $7 million, respectively.

The fair values of the Company’s pension plan assets by asset class are presented below. For further information on the fair value hierarchy and an overview of the Company’s valuation techniques applied, see the “Fair value measures” section of Note 2.

December 31, 2023 ($ in millions)	Level 1	Level 2	Level 3	Not subject to leveling(1)	Total fair value
Asset class					
Equity					
Equity securities	64				**64**
Mutual funds/commingled funds		751			**751**
Emerging market mutual funds/commingled funds		76			**76**
Fixed income					
Government and corporate securities	160	953			**1,113**
Government and corporate—mutual funds/commingled funds		2,410			**2,410**
Emerging market bonds—mutual funds/commingled funds		367			**367**
Real estate				1,225	**1,225**
Insurance contracts			215		**215**
Cash and short-term investments	99	85			**184**
Private equity			60	250	**310**
Total	**323**	**4,642**	**275**	**1,475**	**6,715**

December 31, 2022 ($ in millions)	Level 1	Level 2	Level 3	Not subject to leveling(1)	Total fair value
Asset class					
Equity					
Equity securities	77				**77**
Mutual funds/commingled funds		748			**748**
Emerging market mutual funds/commingled funds		96			**96**
Fixed income					
Government and corporate securities	121	1,036			**1,157**
Government and corporate—mutual funds/commingled funds		2,189			**2,189**
Emerging market bonds—mutual funds/commingled funds		315			**315**
Real estate				1,172	**1,172**
Insurance contracts			57		**57**
Cash and short-term investments	124	129			**253**
Private equity			54	237	**291**
Total	**322**	**4,513**	**111**	**1,409**	**6,355**

(1) Amounts relate to assets measured using the NAV practical expedient which are not subject to leveling.

The Company applies accounting guidance related to the presentation of certain investments using the net asset value (NAV) practical expedient. This accounting guidance exempts investments using this practical expedient from categorization within the fair value hierarchy. Investments measured at NAV are primarily non exchange-traded commingled or collective funds in private equity and real estate where the fair value of the underlying assets is determined by the investment manager. Investments in private equity can never be redeemed, but instead the funds will make distributions through liquidation of the underlying assets. Total unfunded commitments for the private equity funds were approximately $108 million and $114 million at December 31, 2023 and 2022, respectively. The real estate funds are typically subject to a lock-in period of up to three years after subscribing. After this period, the real estate funds typically offer a redemption notice of three to twelve months.

Contributions

Employer contributions were as follows:

	Defined pension benefits			
	Switzerland		International	
($ in millions)	**2023**	**2022**	**2023**	**2022**
Total contributions to defined benefit pension plans	18	37	89	58
Of which, discretionary contributions to defined benefit pension plans	—	—	67	18

The Company expects to contribute approximately $93 million to its defined benefit pension plans in 2024. Of these contributions, $4 million are expected to be non-cash contributions.

The Company also contributes to a number of defined contribution plans. The aggregate expense for these plans in continuing operations was $293 million, $269 million and $278 million in 2023, 2022 and 2021, respectively. Contributions to multi-employer plans were not significant in 2023, 2022 and 2021.

Estimated future benefit payments

The expected future cash flows to be paid by the Company's plans in respect of pension at December 31, 2023, are as follows:

	Defined pension benefits	
($ in millions)	**Switzerland**	**International**
2024	257	259
2025	219	261
2026	215	260
2027	205	266
2028	200	264
Years 2029 - 2033	909	1,267

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Note 18
Share-based payment arrangements

The Company has granted share-based instruments to its employees under three principal share-based payment plans, as more fully described in the respective sections below. Compensation cost for equity-settled awards is recorded in Total cost of sales and in Selling, general and administrative expenses and totaled $103 million, $42 million and $59 million in 2023, 2022 and 2021, respectively, while compensation cost for cash-settled awards, recorded in Selling, general and administrative expenses, was not significant, as mentioned in the WARs, LTIP and Other share-based payments sections of this note. The total tax benefit recognized in 2023, 2022 and 2021 was not significant.

At December 31, 2023, the Company had the ability to issue up to 94 million new shares out of contingent capital in connection with share-based payment arrangements. In addition, 23 million of the 40 million shares held by the Company as treasury stock at December 31, 2023, could be used to settle share-based payment arrangements.

As the primary trading market for the shares of ABB Ltd is the SIX Swiss Exchange (on which the shares are traded in Swiss francs) and substantially all the share-based payment arrangements with employees are based on the Swiss franc share or have strike prices set in Swiss francs, certain data disclosed below related to the instruments granted under share-based payment arrangements are presented in Swiss francs.

Management Incentive Plan

Up to 2019, the Company offered, under the MIP, options and cash-settled warrant appreciation rights (WARs) to key employees for no consideration. The options and WARs expire six years from the date of grant. Participants may exercise or sell options and exercise WARs after the vesting period, which is three years from the date of grant. Starting in 2020, the employee group previously eligible to receive grants under the MIP were granted shares under the LTIP (see LTIP section below) and consequently no grants were made in 2023, 2022 and 2021 under the MIP.

The options granted under the MIP allow participants to purchase shares of ABB Ltd at predetermined prices. Participants may sell the options rather than exercise the right to purchase shares. Equivalent warrants are listed by a third-party bank on the SIX Swiss Exchange, which facilitates pricing and transferability of options granted under this plan. The options entitle the holder to request that the third-party bank purchase such options at the market price of equivalent listed warrants related to that MIP launch. If the participant elects to sell the options, the options will thereafter be held by a third party and, consequently, the Company's obligation to deliver shares will be toward this third party.

Each WAR gives the participant the right to receive, in cash, the market price of an equivalent listed warrant on the date of exercise of the WAR.

Options

The fair value of each option was estimated on the date of grant using a lattice model. As mentioned previously, no options were granted in 2023, 2022 and 2021. In 2023, 25 million options were exercised, representing 5 million shares, with the shares delivered out of treasury stock. Cash received upon exercise amounted to approximately $100 million. In 2023, 2022 and 2021, the aggregate intrinsic value (on the date of exercise) of options exercised was approximately $64 million, $143 million and $313 million, respectively. At December 31, 2023, all options granted under the MIP were vested and exercisable. The aggregate intrinsic value at December 31, 2023, of options outstanding was approximately $297 million.

Presented below is a summary, by launch, related to options outstanding at December 31, 2023:

Exercise price (in Swiss francs)[1]	Number of options (in millions)	Number of shares (in millions)[2]	Weighted-average remaining contractual term (in years)
22.05	61.3	12.3	0.7
17.63	15.7	3.1	1.7
Total number of options and shares	**77.0**	**15.4**	**0.9**

(1) Information presented reflects the exercise price per share of ABB Ltd.
(2) Information presented reflects the number of shares of ABB Ltd that can be received upon exercise.

WARs

As each WAR gives the holder the right to receive cash equal to the market price of the equivalent listed warrant on date of exercise, the Company records a liability based upon the fair value of outstanding WARs at each period end. In Selling, general and administrative expenses, the Company records the changes in fair value of the outstanding WARs. To hedge its exposure to fluctuations in the fair value of outstanding WARs, the Company had purchased cash-settled call options, which entitle the Company to receive amounts equivalent to its obligations under the outstanding WARs. The cash-settled call options are recorded as derivatives measured at fair value, with subsequent changes in fair value recorded in Selling, general and administrative expenses. The total impact in Selling, general and administrative expenses in 2023, 2022 and 2021 was not significant.

At December 31, 2023, the number of WARs outstanding and their aggregate fair value was not significant. The aggregate fair value of outstanding WARs was $15 million at December 31, 2022. The fair value of WARs was determined based upon the trading price of equivalent warrants listed on the SIX Swiss Exchange.

As mentioned previously, no WARs were granted in 2023, 2022 and 2021. In 2023 and 2021, share-based liabilities of $15 million and $25 million were paid upon exercise of WARs by participants. The amount in 2022 was not significant.

Employee Share Acquisition Plan

The employee share acquisition plan (ESAP) is an employee stock-option plan with a savings feature. Employees save over a twelve-month period, by way of regular payroll deductions. At the end of the savings period, employees choose whether to exercise their stock options using their savings plus interest, if any, to buy ABB Ltd shares at the exercise price set at the grant date, or have their savings returned with any interest. The savings are accumulated in bank accounts held by a third-party trustee on behalf of the participants and earn interest, where applicable. Employees can withdraw from the ESAP at any time during the savings period and will be entitled to a refund of their accumulated savings.

The fair value of each option is estimated on the date of grant using the same option valuation model as described under the MIP, using the assumptions noted in the table below. The expected term of the option granted has been determined to be the contractual one-year life of each option, at the end of which the options vest and the participants are required to decide whether to exercise their options or have their savings returned with interest. The risk-free rate is based on one-year Swiss franc interest rates, reflecting the one-year contractual life of the options. In estimating forfeitures, the Company has used the data from previous ESAP launches.

	2023	2022	2021
Expected volatility	21%	25%	20%
Dividend yield	2.8%	3.0%	2.9%
Expected term	1 year	1 year	1 year
Risk-free interest rate	1.6%	1.1%	-0.6%

Presented below is a summary of activity under the ESAP:

	Number of shares (in millions)(1)	Weighted-average exercise price (in Swiss francs)(2)	Weighted-average remaining contractual term (in years)	Aggregate intrinsic value (in millions of Swiss francs)(2)(3)
Outstanding at January 1, 2023	**1.8**	**27.99**		
Granted	1.8	30.49		
Forfeited	(0.1)	28.04		
Exercised(4)	(1.3)	27.99		
Not exercised (savings returned plus interest)	(0.4)	27.99		
Outstanding at December 31, 2023	**1.8**	**30.49**	**0.8**	**12**
Vested and expected to vest at December 31, 2023	**1.7**	**30.49**	**0.8**	**12**
Exercisable at December 31, 2023	**—**	**—**	**—**	**—**

(1) Includes shares represented by ADS.
(2) Information presented for ADS is based on equivalent Swiss franc denominated awards.
(3) Computed using the closing price, in Swiss francs, of ABB Ltd shares on the SIX Swiss Exchange and the exercise price of each option in Swiss francs.
(4) The cash received in 2023 from exercises was approximately $40 million. The shares were delivered out of treasury stock.

The exercise price per ABB Ltd share of 30.49 Swiss francs for the 2023 grant was determined using the closing price of the ABB Ltd share on the SIX Swiss Exchange on the grant date. The exercise prices per ABB Ltd share and per ADS of 27.99 Swiss francs and $28.09, respectively, for the 2022 grant, and 30.32 Swiss francs and $33.35, respectively, for the 2021 grant were determined using the closing price of the ABB Ltd share on the SIX Swiss Exchange and ADS on the New York Stock Exchange on the respective grant dates. In connection with the spin-off of the Turbocharging Division in October 2022, the strike prices of the ESAP options outstanding at the time of spin-off were reduced, as per the terms and conditions of the original grant, to neutralize the effect of the spin-off on the Company's share price, resulting in an equivalent fair value before and after the spin-off. Consequently, the exercise prices per ABB Ltd share and per ADS for the 2021 grant, were adjusted to 29.16 Swiss francs and $32.10, respectively.

At December 31, 2023, the total unrecognized compensation cost related to non-vested options granted under the ESAP was not significant. The weighted-average grant-date fair value (per option) of options granted during 2023, 2022 and 2021 was 2.28 Swiss francs, 2.47 Swiss francs and 1.96 Swiss francs, respectively. The total intrinsic value (on the date of exercise) of options exercised in 2023, 2022 and 2021 was not significant.

Long-Term Incentive Plan

The long-term incentive plan (LTIP) involves annual grants of the Company's stock subject to certain conditions (Performance Shares) to members of the Company's Executive Committee and selected other senior executives, as defined in the terms of the LTIP. The ultimate amount delivered under the LTIP's Performance Shares grant is based on achieving certain results against targets, as set out below, over a three-year period from grant and the final amount is delivered to the participants at the end of this period. In addition, for certain awards to vest, the participant has to fulfill a three-year service condition as defined in the terms and conditions of the LTIP.

The Performance Shares under the 2023 and 2022 LTIP launches include a component based on the Company's earnings per share performance (weighted 50 percent), a component based on the Company's relative total shareholder return (weighted 30 percent) and a sustainability component based on the Company's CO_2 equivalent emissions reductions (weighted 20 percent). The Performance Shares under the 2021 LTIP launch comprise of a component based on the Company's earnings per share performance and a component based on the Company's relative total shareholder return, both with equal weighting.

For the relative total shareholder return component of the Performance Shares, the actual number of shares that will be delivered at a future date is based on the Company's total shareholder return performance relative to a peer group of companies over a three-year period starting with the year of grant. The actual number of shares that will ultimately be delivered will vary depending on the relative total shareholder return outcome achieved between a lower threshold (no shares delivered) and an upper threshold (the number of shares delivered is capped at 200 percent of the conditional grant).

For the earnings per share performance component of the Performance Shares, the actual number of shares that will be delivered at a future date is based on the Company's average earnings per share over three financial years, beginning with the year of launch. The actual number of shares that will ultimately be delivered will vary depending on the earnings per share outcome as computed under each LTIP launch, interpolated between a lower threshold (no shares delivered) and an upper threshold (the number of shares delivered is capped at 200 percent of the conditional grant).

For the sustainability component of the Performance Shares, the actual number of shares that will be delivered at a future date is based on the Company's scope 1 and 2 CO_2 equivalent emissions reduction over three financial years, beginning with the year of launch, compared to 2019 baseline emissions. The actual number of shares that will ultimately be delivered will vary depending on the sustainability outcome as computed under the LTIP launch, interpolated between a lower threshold (no shares delivered) and an upper threshold (the number of shares delivered is capped at 200 percent of the conditional grant).

Starting in 2020, key employees which were previously eligible to participate in the MIP and which were not included in the employee group granted the Performance Shares described above, were granted Restricted Shares of the Company under the LTIP. The Restricted Shares do not have performance conditions and vest over a three-year period from the grant date.

Under the 2023, 2022 and 2021 LTIP launches, participants generally do not have the ability to receive any of the award in cash, subject to legal restrictions in certain jurisdictions.

Presented below is a summary of activity under the Performance Shares of the LTIP:

	Number of Performance Shares (in millions)	Weighted-average grant-date fair value per share (Swiss francs)
Nonvested at January 1, 2023	**1.9**	**27.01**
Granted	0.8	29.18
Vested	(0.9)	16.55
Forfeited	(0.1)	31.89
Nonvested at December 31, 2023	**1.7**	**33.60**

The aggregate fair value, at the dates of grant, of Performance Shares granted in 2023, 2022 and 2021 was $24 million, $26 million and $37 million, respectively. The total grant-date fair value of shares that vested during 2023 was $17 million while in 2022 and 2021 it was not significant. The weighted-average grant-date fair value (per share) of shares granted during 2023, 2022 and 2021 was 29.18 Swiss francs, 33.33 Swiss francs and 38.92 Swiss francs, respectively. The total fair value of Performance Shares delivered in 2023 (including shares vested in prior years and delivered in the year) was approximately $80 million while in 2022 and 2021 it was not significant.

Presented below is a summary of activity under the Restricted Shares of the LTIP:

	Number of Restricted Shares (in millions)	Weighted-average grant-date fair value per share (Swiss francs)
Nonvested at January 1, 2023	**2.6**	**23.65**
Granted	0.9	31.38
Vested	(1.1)	16.99
Forfeited	(0.1)	28.71
Nonvested at December 31, 2023	**2.3**	**29.51**

The aggregate fair value, at the dates of grant, of Restricted Shares granted in 2023, 2022 and 2021 was $30 million, $27 million and $26 million, respectively. The total grant-date fair value of shares that vested during 2023 was $20 million while in 2022 and 2021 it was not significant. The weighted-average grant-date fair value (per share) of shares granted during 2023, 2022 and 2021 was 31.38 Swiss francs, 30.52 Swiss francs and 26.39 Swiss francs, respectively. The total fair value of Restricted Shares delivered in 2023 was approximately $35 million while in 2022 and 2021 it was not significant.

Equity-settled awards are recorded in the Additional paid-in capital component of Stockholders' equity, with compensation cost recorded in Selling, general and administrative expenses over the vesting period (which is from grant date to the end of the vesting period) based on the grant-date fair value of the shares. Cash-settled awards are recorded as a liability, remeasured at fair value at each reporting date for the percentage vested, with changes in the liability recorded in Selling, general and administrative expenses.

At December 31, 2023, total unrecognized compensation cost related to equity-settled awards under the LTIP was $79 million and is expected to be recognized over a weighted-average period of 1.9 years. The compensation cost recorded in 2023, 2022 and 2021 for cash-settled awards was not significant.

For the relative total shareholder return component of the LTIP launches, the fair value of granted shares at grant date, for equity-settled awards, and at each reporting date, for cash-settled awards, is determined using a Monte Carlo simulation model. The main inputs to this model are the Company's share price and dividend yield, the volatility of the Company's and the peer group's share price as well as the correlation between the peer companies. For the earnings per share component of the LTIP launches, the fair value of granted shares is based on the market price of the ABB Ltd share at grant date for equity-settled awards and at each reporting date for cash-settled awards, as well as the probable outcome of the earnings per share achievement, as computed using a Monte Carlo simulation model. The main inputs to this model are the Company's and external financial analysts' revenue growth rates and Operational EBITA margin expectations. For the sustainability component of the LTIP launches, the fair value of granted shares is based on the market price of the ABB Ltd share at grant date for equity-settled awards and at each reporting date for cash-settled awards, as well as the probable outcome of the sustainability component achievement, as determined by internal modelling based on the Company's CO_2 equivalent emissions.

Other share-based payments

The Company has other minor share-based payment arrangements with certain employees. The compensation cost related to these arrangements in 2023, 2022 and 2021 was not significant.

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Note 19
Stockholders' equity

Capital

ABB Ltd is a corporation organized under the laws of Switzerland and the rights of its shareholders are governed by Swiss law and its Articles of Incorporation.

At December 31, 2023 and 2022, the Company had 1,882 million shares and 1,965 million shares, respectively, that were registered and issued.

In line with the revised provisions of Swiss corporate law effective January 1, 2023, shareholders approved, at ABB's Annual General Meeting of Shareholders (AGM) in March 2023, the introduction of a capital band ranging from 90 percent to 110 percent of the issued share capital entered in the commercial register at that time. The capital band replaced 200 million shares of authorized capital, which expired in March 2023 and no longer exist under the revised law. Within this capital band, the Board of Directors is authorized to increase or reduce the share capital once or several times until March 23, 2028, or until an earlier expiry of the capital band. The contingent share capital of the Company, which forms a component of the total authorized shares, as specified in the ABB Ltd Articles of Incorporation, remains unchanged. At December 31, 2023 and 2022, the Company had a total of 2,383 million and 2,469 million authorized shares, respectively.

Dividends

At the AGM in March 2023, the shareholders approved the proposal of the Board of Directors to distribute a total of 0.84 Swiss francs per share. The approved dividend distribution amounted to $1,706 million, with the Company disbursing a portion in March 2023 and the remaining amounts in April 2023. At the AGM in March 2022, the shareholders approved the proposal of the Board of Directors to distribute a total of 0.82 Swiss francs per share. The approved dividend distribution amounted to $1,700 million, with the Company disbursing a portion in March 2022 and the remaining amounts in April 2022. At the AGM in March 2021, the shareholders approved the proposal of the Board of Directors to distribute a total of 0.80 Swiss francs per share. The approved dividend distribution amounted to $1,730 million, with the Company disbursing a portion in March 2021 and the remaining amounts in April 2021.

Amounts available to be distributed as dividends to the stockholders of ABB Ltd are based on the requirements of Swiss law and ABB Ltd's Articles of Incorporation, and are determined based on amounts presented in the unconsolidated financial statements of ABB Ltd, prepared in accordance with Swiss law. At December 31, 2023, the total unconsolidated stockholders' equity of ABB Ltd was 3,917 million Swiss francs ($4,684 million), including 226 million Swiss francs ($270 million) representing share capital, 4,982 million Swiss francs ($5,957 million) representing reserves and 1,291 million Swiss francs ($1,544 million) representing a reduction of equity for treasury shares. Of the reserves, 1,291 million Swiss francs ($1,544 million) relating to treasury shares and 45 million Swiss francs ($54 million) representing 20 percent of share capital, at December 31, 2023, are restricted by law and not available for distribution.

Treasury stock transactions

In July 2020, the Company announced it intended to initially buy 10 percent of its share capital (which at the time represented a maximum of 180 million shares, in addition to those already held in treasury) through the share buyback program that started in July 2020. The initial share buyback program was executed on a second trading line on the SIX Swiss Exchange and was completed in March 2021. Through this buyback program, the Company purchased a total of 129 million shares for approximately $3.5 billion. At the March 2021 AGM, shareholders approved the cancellation of 115 million of the shares purchased under this buyback program and the cancellation was completed in the second quarter of 2021, resulting in a decrease in Treasury stock of $3,157 million and a corresponding total decrease in Capital stock, Additional paid-in capital and Retained earnings.

In March 2021, the Company announced a follow-up share buyback program of up to $4.3 billion. This buyback program, which was launched in April 2021, was executed on a second trading line on the SIX Swiss Exchange and was completed in March 2022. Through this follow-up buyback program, the Company purchased a total of 90 million shares for approximately $3.1 billion. At the March 2022 AGM, shareholders approved the cancellation of 88 million shares which had been purchased under the share buyback programs. The cancellation was completed in the second quarter of 2022, resulting in a decrease in Treasury stock of $2,876 million and a corresponding total decrease in Capital stock, Additional paid-in capital and Retained earnings.

In March 2022, the Company announced a share buyback program of up to $3 billion. This program, which was launched in April 2022, was executed on a second trading line on the SIX Swiss Exchange and was completed in March 2023. Through this buyback program, the Company purchased a total of 67 million shares for approximately $2.0 billion. In the second quarter of 2023 the Company cancelled 83 million shares which had been purchased under its share buyback programs. This resulted in a decrease in Treasury stock of $2,567 million and a corresponding total decrease in Capital stock, Additional paid-in capital and Retained earnings.

In March 2023, the Company announced a share buyback program of up to $1 billion. This program, which was launched in April 2023, is being executed on a second trading line on the SIX Swiss Exchange and is planned to run until the Company's 2024 AGM.

Under these buyback programs, in 2023, 2022 and 2021, the Company purchased 25 million, 91 million and 78 million, respectively, of its own shares, resulting in an increase in Treasury stock of $893 million, $2,842 million and $2,651 million, respectively.

In addition to the share buyback programs, in 2023, 2022 and 2021, the Company purchased a combined total of 9 million, 20 million and 33 million, respectively, of its own shares on the open market, mainly for use in connection with its employee share plans, resulting in an increase in Treasury stock of $354 million, $660 million and $1,032 million, respectively.

Obligations to issue shares relating to employee incentive programs

At December 31, 2023, the Company had outstanding obligations to deliver:

- up to 12 million shares relating to the options granted under the 2018 launch of the MIP, with a strike price of 22.05 Swiss francs, vested in August 2021 and expiring in August 2024,
- up to 3 million shares relating to the options granted under the 2019 launch of the MIP, with a strike price of 17.63 Swiss francs, vested in August 2022 and expiring in August 2025,
- up to 2 million shares relating to the ESAP, vesting and expiring in October 2024,
- up to 7 million shares to Eligible Participants under the 2023, 2022 and 2021 launches of the LTIP, vesting and expiring in April 2026, April 2025 and April 2024, respectively, and
- less than 1 million shares in connection with certain other share-based payment arrangements with employees.

In addition to the above obligations, the Company had sold, upon and in connection with each launch of the MIP, call options to a bank at fair value, giving the bank the right to acquire shares equivalent to the number of shares represented by the MIP WAR awards to participants. Under the terms of the agreement with the bank, the call options can only be exercised by the bank to the extent that MIP participants have exercised their WARs. At December 31, 2023, such call options representing 2.7 million shares and with strike prices ranging from 17.63 to 22.05 Swiss francs (weighted-average strike price of 21.11 Swiss francs) were held by the bank. The call options expire in periods ranging from August 2024 to August 2025.

See Note 18 for a description of the above share-based payment arrangements.

In 2023, 2022 and 2021, the Company delivered 6 million, 16 million and 36 million shares, respectively, out of treasury stock, for options exercised in relation to the MIP. In addition, in 2023 and 2021, the Company delivered 1.3 million and 1.7 million shares, respectively, out of treasury stock for options exercised in relation to the ESAP. The number of shares delivered in 2022 under the ESAP was not significant.

Issuance of subsidiary shares

In November 2022, the Company received gross proceeds of 203 million Swiss francs ($216 million) through a private placement of shares in its ABB E-Mobility subsidiary, ABB E-mobility Holding Ltd (ABB E-Mobility), reducing the Company's beneficial ownership in the subsidiary from 100 percent to 92 percent. This resulted in an increase in Additional paid-in capital of $120 million. In February 2023, the Company obtained an additional amount of funding raised through the private placement of new shares of ABB E-Mobility, increasing the total gross proceeds by an additional 325 million Swiss francs (approximately $351 million) and further reducing the Company's ownership in ABB E-Mobility to 81 percent. This resulted in an increase in Additional paid-in capital of $170 million. In December 2023, an agreement was reached to increase the ownership percentage of the investors participating in these private placements to 25 percent for no additional consideration.

Note 20
Earnings per share

Basic earnings per share is calculated by dividing income by the weighted-average number of shares outstanding during the year. Diluted earnings per share is calculated by dividing income by the weighted-average number of shares outstanding during the year, assuming that all potentially dilutive securities were exercised, if dilutive. Potentially dilutive securities comprise outstanding written call options and outstanding options and shares granted subject to certain conditions under the Company's share-based payment arrangements. In 2022, outstanding securities representing a maximum of 2 million shares were excluded from the calculation of diluted earnings per share as their inclusion would have been antidilutive. None were excluded in 2023 and 2021.

Basic earnings per share:

($ in millions, except per share data in $)	2023	2022	2021
Amounts attributable to ABB shareholders:			
Income from continuing operations, net of tax	3,769	2,517	4,625
Loss from discontinued operations, net of tax	(24)	(42)	(79)
Net income	**3,745**	**2,475**	**4,546**
Weighted-average number of shares outstanding (in millions)	**1,855**	**1,899**	**2,001**
Basic earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	2.03	1.33	2.31
Loss from discontinued operations, net of tax	(0.01)	(0.02)	(0.04)
Net income	**2.02**	**1.30**	**2.27**

Diluted earnings per share:

($ in millions, except per share data in $)	2023	2022	2021
Amounts attributable to ABB shareholders:			
Income from continuing operations, net of tax	3,769	2,517	4,625
Loss from discontinued operations, net of tax	(24)	(42)	(79)
Net income	**3,745**	**2,475**	**4,546**
Weighted-average number of shares outstanding (in millions)	1,855	1,899	2,001
Effect of dilutive securities:			
Call options and shares	12	11	18
Adjusted weighted-average number of shares outstanding (in millions)	**1,867**	**1,910**	**2,019**
Diluted earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	2.02	1.32	2.29
Loss from discontinued operations, net of tax	(0.01)	(0.02)	(0.04)
Net income	**2.01**	**1.30**	**2.25**

Note 21
Other comprehensive income

The following table includes amounts recorded within “Total other comprehensive income (loss)” including the related income tax effects:

	2023			2022			2021		
($ in millions)	Before tax	Tax effect	Net of tax	Before tax	Tax effect	Net of tax	Before tax	Tax effect	Net of tax
Foreign currency translation adjustments:									
Foreign currency translation adjustments	(292)	2	**(290)**	(685)	—	**(685)**	(521)	—	**(521)**
Net loss on complete or substantially complete liquidations of foreign subsidiaries	—	—	**—**	5	—	**5**	—	—	**—**
Changes attributable to divestments	9	—	**9**	41	—	**41**	(9)	—	**(9)**
Net change during the year	**(283)**	**2**	**(281)**	**(639)**	**—**	**(639)**	**(530)**	**—**	**(530)**
Available-for-sale securities:									
Net unrealized gains (losses) arising during the year	6	(1)	**5**	(28)	5	**(23)**	(13)	3	**(10)**
Reclassification adjustments for net (gains) losses included in net income	8	(2)	**6**	2	—	**2**	(6)	1	**(5)**
Net change during the year	**14**	**(3)**	**11**	**(26)**	**5**	**(21)**	**(19)**	**4**	**(15)**
Pension and other postretirement plans:									
Prior service (costs) credits arising during the year	1	(2)	**(1)**	(2)	2	**—**	2	(2)	**—**
Net actuarial gains (losses) arising during the year	(339)	57	**(282)**	298	(72)	**226**	437	(26)	**411**
Amortization of prior service cost (credit) included in net income	(11)	2	**(9)**	(13)	(3)	**(16)**	(14)	—	**(14)**
Amortization of net actuarial loss included in net income	48	(10)	**38**	55	(11)	**44**	65	4	**69**
Net losses from settlements and curtailments included in net income	16	(2)	**14**	11	(2)	**9**	7	—	**7**
Changes attributable to divestments	3	—	**3**	(8)	—	**(8)**	(8)	2	**(6)**
Net change during the year	**(282)**	**45**	**(237)**	**341**	**(86)**	**255**	**489**	**(22)**	**467**
Derivative instruments and hedges:									
Net gains (losses) arising during the year	(11)	1	**(10)**	(10)	(2)	**(12)**	7	1	**8**
Reclassification adjustments for net (gains) losses included in net income	8	—	**8**	12	—	**12**	(13)	—	**(13)**
Net change during the year	**(3)**	**1**	**(2)**	**2**	**(2)**	**—**	**(6)**	**1**	**(5)**
Total other comprehensive income (loss)	**(554)**	**45**	**(509)**	**(322)**	**(83)**	**(405)**	**(66)**	**(17)**	**(83)**

The following table shows changes in Accumulated other comprehensive loss (OCI) attributable to ABB, by component, net of tax:

($ in millions)	Foreign currency translation adjustments	Unrealized gains (losses) on available-for-sale securities	Pension and other post-retirement plan adjustments	Derivative instruments and hedges	Accumulated other comprehensive loss
Balance at January 1, 2021	**(2,460)**	**17**	**(1,556)**	**(3)**	**(4,002)**
Other comprehensive (loss) income before reclassifications	(521)	(10)	411	8	**(112)**
Amounts reclassified from OCI	(9)	(5)	56	(13)	**29**
Total other comprehensive (loss) income	**(530)**	**(15)**	**467**	**(5)**	**(83)**
Less:					
Amounts attributable to noncontrolling interests	4	—	—	—	**4**
Balance at December 31, 2021[1]	**(2,993)**	**2**	**(1,089)**	**(8)**	**(4,088)**
Other comprehensive (loss) income before reclassifications	(685)	(23)	226	(12)	**(494)**
Amounts reclassified from OCI	46	2	29	12	**89**
Total other comprehensive (loss) income	**(639)**	**(21)**	**255**	**—**	**(405)**
Spin-off of the Turbocharging Division	(93)	—	(5)	—	**(98)**
Less:					
Amounts attributable to noncontrolling interests	(34)	—	(1)	—	**(35)**
Balance at December 31, 2022	**(3,691)**	**(19)**	**(838)**	**(8)**	**(4,556)**
Other comprehensive (loss) income before reclassifications	(290)	5	(283)	(10)	**(578)**
Amounts reclassified from OCI	9	6	46	8	**69**
Total other comprehensive (loss) income	**(281)**	**11**	**(237)**	**(2)**	**(509)**
Less:					
Amounts attributable to noncontrolling interests and redeemable noncontrolling interests	5	—	—	—	**5**
Balance at December 31, 2023	**(3,977)**	**(8)**	**(1,075)**	**(10)**	**(5,070)**

(1) Due to rounding, numbers presented may not add to the totals provided.

The following table reflects amounts reclassified out of OCI in respect of Foreign currency translation adjustments and Pension and other postretirement plan adjustments:

($ in millions) Details about OCI components	Location of (gains) losses reclassified from OCI	2023	2022	2021
Foreign currency translation adjustments:				
Net loss on complete or substantially complete liquidations of foreign subsidiaries	Other income (expense), net	—	5	—
Changes attributable to divestments	Other income (expense), net	9	41	(9)
Amounts reclassified from OCI		**9**	**46**	**(9)**
Pension and other postretirement plan adjustments:				
Amortization of prior service cost (credit)	Non-operational pension (cost) credit	(11)	(13)	(14)
Amortization of net actuarial loss	Non-operational pension (cost) credit	48	55	65
Net losses from settlements and curtailments	Non-operational pension (cost) credit	16	11	7
Changes attributable to divestments	Other income (expense), net	3	(8)	(8)
Total before tax		**56**	**45**	**50**
Tax	Income tax expense	(10)	(16)	4
Changes in tax attributable to divestments	Other income (expense), net	—	—	2
Amounts reclassified from OCI		**46**	**29**	**56**

The amounts reclassified out of “OCI in respect of Unrealized gains (losses) on available-for-sale securities” and “Derivative instruments and hedges” were not significant in 2023, 2022 and 2021.

Note 22
Restructuring and related expenses

Restructuring-related activities

In 2023, 2022 and 2021, the Company executed various restructuring-related activities and incurred the following charges, net of changes in estimates:

($ in millions)	2023	2022	2021
Employee severance costs	120	81	101
Estimated contract settlement, loss order and other costs	7	209	31
Inventory and long-lived asset impairments	49	7	24
Total	**176**	**297**	**156**

Expenses associated with these activities are recorded in the following line items in the Consolidated Income Statements:

($ in millions)	2023	2022	2021
Total cost of sales	65	24	71
Selling, general and administrative expenses	52	40	21
Non-order related research and development expenses	3	2	2
Other income (expense), net	56	231	62
Total	**176**	**297**	**156**

In 2022, the Company completed a plan (initiated in 2021) to fully exit its full train retrofit business by transferring the remaining contracts to a third party. The Company recorded $195 million of restructuring expenses in connection with this business exit primarily for contract settlement costs. Prior to exiting this business, the business was reported as part of the Company's non-core business activities within Corporate and Other.

At December 31, 2023 and 2022, $250 million and $198 million, respectively, was recorded for restructuring-related liabilities and is primarily included in Other provisions.

Note 23
Operating segment and geographic data

The Chief Operating Decision Maker (CODM) is the Chief Executive Officer. The CODM allocates resources to and assesses the performance of each operating segment using the information outlined below. The Company is organized into the following segments, based on products and services: Electrification, Motion, Process Automation and Robotics & Discrete Automation. The remaining operations of the Company are included in Corporate and Other.

Effective January 1, 2023, the E-mobility Division is no longer managed within the Electrification segment and has become a separate operating segment. This new segment does not currently meet any of the size thresholds to be considered a reportable segment and as such is presented within Corporate and Other. The segment information for 2022 and 2021, and at December 31, 2022 and 2021, has been recast to reflect this change.

A description of the types of products and services provided by each reportable segment is as follows:

- Electrification: manufactures and sells electrical products and solutions which are designed to provide safe, smart and sustainable electrical flow from the substation to the socket. The portfolio of increasingly digital and connected solutions includes renewable power solutions, modular substation packages, distribution automation products, switchboards and panelboards, switchgear, UPS solutions, circuit breakers, measuring and sensing devices, control products, wiring accessories, enclosures and cabling systems and intelligent home and building solutions, designed to integrate and automate lighting, heating, ventilation, security and data communication networks. The products and services are delivered through six operating Divisions: Distribution Solutions, Smart Power, Smart Buildings, Installation Products, and Service, as well as, prior to its sale in July 2023, the Power Conversion Division.

- Motion: designs, manufactures and sells drives, motors, generators and traction converters that are driving the low-carbon future for industries, cities, infrastructure and transportation. These products, digital technology and related services enable industrial customers to increase energy efficiency, improve safety and reliability, and achieve precise control of their processes. Building on over 140 years of cumulative experience in electric powertrains, Motion combines domain expertise and technology to deliver the optimum solution for a wide range of applications in all industrial segments. In addition, Motion, along with its partners, has a leading global service presence. These products and services are delivered through seven operating Divisions: Large Motors and Generators, IEC LV Motors, NEMA Motors, Drive Products, System Drives, Service, and Traction, as well as, prior to its sale in November 2021, the Mechanical Power Transmission Division.
- Process Automation: offers a broad range of industry-specific, integrated automation, electrification and digital solutions, as well as lifecycle services for the process, hybrid and marine industries. The product portfolio includes control technologies, industrial software, advanced analytics, sensing and measurement technology, and marine propulsion systems. In addition, Process Automation offers a comprehensive range of services, from repair to advanced digital capabilities such as remote monitoring, preventive maintenance, asset performance management, emission monitoring and cybersecurity. The products, systems and services are currently delivered through four operating Divisions: Energy Industries, Process Industries, Marine & Ports and Measurement & Analytics, as well as, prior to its spin-off in October 2022, the Turbocharging Division.
- Robotics & Discrete Automation: delivers its products, solutions and services through two operating Divisions: Robotics provides industrial and collaborative robots, autonomous mobile robotics, mapping and navigation solutions, robotic solutions, field services, spare parts and digital services. Machine Automation specializes in automation solutions based on its programmable logic controllers (PLC), industrial PCs (IPC), servo motion, transport systems and machine vision. Both divisions offer software across the entire life cycle, including engineering and simulation software as well as a comprehensive range of digital solutions.

Corporate and Other: Corporate includes headquarter costs, the Company's corporate real estate activities and Corporate Treasury while Other includes the E-mobility operating segment, other non-core operating activities as well as the operating activities of certain divested businesses.

The primary measure of profitability on which the operating segments are evaluated is Operational EBITA, which represents income from operations excluding:

- amortization expense on intangibles arising upon acquisition (acquisition-related amortization),
- restructuring, related and implementation costs,
- changes in the amount recorded for obligations related to divested businesses occurring after the divestment date (changes in obligations related to divested businesses),
- gains and losses from sale of businesses (including fair value adjustment on assets and liabilities held for sale, if any),
- acquisition- and divestment-related expenses and integration costs,
- certain other non-operational items, as well as
- foreign exchange/commodity timing differences in income from operations consisting of: (a) unrealized gains and losses on derivatives (foreign exchange, commodities, embedded derivatives), (b) realized gains and losses on derivatives where the underlying hedged transaction has not yet been realized, and (c) unrealized foreign exchange movements on receivables/payables (and related assets/liabilities).

Certain other non-operational items generally includes certain regulatory, compliance and legal costs, certain asset write downs/impairments and certain other fair value changes, changes in estimates relating to opening balance sheets of acquired businesses (changes in pre-acquisition estimates), as well as other items which are determined by management on a case-by-case basis.

The CODM primarily reviews the results of each segment on a basis that is before the elimination of profits made on inventory sales between segments. Segment results below are presented before these eliminations, with a total deduction for intersegment profits to arrive at the Company's consolidated Operational EBITA. Intersegment sales and transfers are accounted for as if the sales and transfers were to third parties, at current market prices.

The following tables present disaggregated segment revenues from contracts with customers for 2023, 2022 and 2021:

	2023					
($ in millions)	Electrification	Motion	Process Automation	Robotics & Discrete Automation	Corporate and Other[1]	Total
Geographical markets						
Europe	4,547	2,455	2,294	1,932	340	**11,568**
The Americas	5,926	2,562	1,738	573	291	**11,090**
of which: United States	4,456	2,123	1,076	358	235	**8,248**
Asia, Middle East and Africa	3,899	2,276	2,212	1,119	71	**9,577**
of which: China	1,775	1,148	707	804	34	**4,468**
	14,372	**7,293**	**6,244**	**3,624**	**702**	**32,235**
Product type						
Products	13,437	6,219	3,661	3,063	630	**27,010**
Services and other	935	1,074	2,583	561	72	**5,225**
	14,372	**7,293**	**6,244**	**3,624**	**702**	**32,235**
Third-party revenues	14,372	7,293	6,244	3,624	702	**32,235**
Intersegment revenues	212	521	26	16	(775)	**—**
Total revenues	**14,584**	**7,814**	**6,270**	**3,640**	**(73)**	**32,235**

	2022					
($ in millions)	Electrification	Motion	Process Automation	Robotics & Discrete Automation	Corporate and Other[1]	Total
Geographical markets						
Europe	4,199	2,031	2,248	1,494	313	**10,285**
The Americas	5,140	2,148	1,566	524	195	**9,573**
of which: United States	3,769	1,787	943	373	151	**7,023**
Asia, Middle East and Africa	4,053	2,101	2,199	1,155	80	**9,588**
of which: China	1,948	1,147	666	897	38	**4,696**
	13,392	**6,280**	**6,013**	**3,173**	**588**	**29,446**
Product type						
Products	12,535	5,380	3,311	2,695	550	**24,471**
Services and other	857	900	2,702	478	38	**4,975**
	13,392	**6,280**	**6,013**	**3,173**	**588**	**29,446**
Third-party revenues	13,392	6,280	6,013	3,173	588	**29,446**
Intersegment revenues	227	465	31	8	(731)	**—**
Total revenues	**13,619**	**6,745**	**6,044**	**3,181**	**(143)**	**29,446**

	2021					
($ in millions)	Electrification	Motion	Process Automation	Robotics & Discrete Automation	Corporate and Other[1]	Total
Geographical markets						
Europe	4,371	2,015	2,416	1,578	149	**10,529**
The Americas	4,379	2,346	1,431	439	91	**8,686**
of which: United States	3,234	1,952	833	308	70	**6,397**
Asia, Middle East and Africa	3,907	2,111	2,367	1,270	75	**9,730**
of which: China	2,055	1,156	740	949	32	**4,932**
	12,657	**6,472**	**6,214**	**3,287**	**315**	**28,945**
Product type						
Products	11,773	5,555	3,298	2,804	315	**23,745**
Services and other	884	917	2,916	483	—	**5,200**
	12,657	**6,472**	**6,214**	**3,287**	**315**	**28,945**
Third-party revenues	12,657	6,472	6,214	3,287	315	**28,945**
Intersegment revenues	237	453	45	10	(745)	**—**
Total revenues	**12,894**	**6,925**	**6,259**	**3,297**	**(430)**	**28,945**

(1) The amounts shown for “Intersegment revenues” within Corporate and Other primarily represents the consolidated intersegment revenue elimination. These amounts include intersegment revenues of $67 million, $65 million and $33 million for 2023, 2022 and 2021, respectively.

Revenues by geography reflect the location of the customer. In 2023, 2022 and 2021 the United States and China are the only countries where revenue exceeded 10 percent of total revenues. In each of 2023, 2022 and 2021 more than 98 percent of the Company’s total revenues were generated from customers outside Switzerland.

The following tables present Operational EBITA, the reconciliations of consolidated Operational EBITA to Income from continuing operations before taxes, as well as Depreciation and amortization, and Capital expenditures for 2023, 2022 and 2021, and Total assets at December 31, 2023, 2022 and 2021:

($ in millions)	2023	2022	2021
Operational EBITA:			
Electrification	2,937	2,343	2,120
Motion	1,475	1,163	1,183
Process Automation	909	848	801
Robotics & Discrete Automation	536	340	355
Corporate and Other:			
— E-mobility	(167)	(15)	1
— Corporate costs, intersegment elimination and other	(263)	(169)	(338)
Total	**5,427**	**4,510**	**4,122**
Acquisition-related amortization	(220)	(229)	(250)
Restructuring, related and implementation costs[1]	(219)	(347)	(160)
Changes in obligations related to divested businesses	3	88	(9)
Gains and losses from sale of businesses	101	(7)	2,193
Acquisition- and divestment-related expenses and integration costs	(74)	(195)	(132)
Foreign exchange/commodity timing differences in income from operations:			
Unrealized gains and losses on derivatives (foreign exchange, commodities, embedded derivatives)	19	32	(54)
Realized gains and losses on derivatives where the underlying hedged transaction has not yet been realized	12	(48)	(2)
Unrealized foreign exchange movements on receivables/payables (and related assets/liabilities)	(13)	(15)	20
Certain other non-operational items:			
Other income/expenses relating to the Power Grids joint venture	36	(57)	(34)
Regulatory, compliance and legal costs	—	(317)	—
Business transformation costs[2]	(205)	(152)	(92)
Changes in pre-acquisition estimates	(4)	(10)	6
Gains and losses from sale of investments in equity-accounted companies	—	43	—
Certain other fair value changes, including asset impairments	(10)	45	119
Other non-operational items	18	(4)	(9)
Income from operations	**4,871**	**3,337**	**5,718**
Interest and dividend income	165	72	51
Interest and other finance expense	(275)	(130)	(148)
Non-operational pension (cost) credit	17	115	166
Income from continuing operations before taxes	**4,778**	**3,394**	**5,787**

(1) Amounts in 2023 and 2022 include impairment of certain assets.
(2) Amounts in 2023, 2022 and 2021 include ABB Way process transformation costs of $188 million, $131 million and $80 million, respectively.

	Depreciation and amortization			Capital expenditures[1]			Total assets[1],[2] at December 31,		
($ in millions)	2023	2022	2021	2023	2022	2021	2023	2022	2021
Electrification	365	382	416	386	343	314	12,668	12,500	12,096
Motion	149	141	172	171	150	230	7,016	6,565	5,936
Process Automation	56	75	83	66	100	85	4,971	4,598	5,009
Robotics & Discrete Automation	138	141	144	71	86	96	5,047	4,901	4,860
Corporate and Other	72	75	78	76	83	95	11,238	10,584	12,359
Consolidated	**780**	**814**	**893**	**770**	**762**	**820**	**40,940**	**39,148**	**40,260**

(1) Capital expenditures and Total assets are after intersegment eliminations and therefore reflect third-party activities only.
(2) At December 31, 2021, Corporate and Other included $1,609 million related to the equity investment in Hitachi Energy, which was subsequently sold in December 2022 (see Note 4).

Other geographic information

Geographic information for long-lived assets was as follows:

	Long-lived assets at December 31,	
($ in millions)	**2023**	**2022**
Europe	2,762	2,533
The Americas	1,335	1,256
Asia, Middle East and Africa	938	963
Total	**5,035**	**4,752**

Long-lived assets represent Property, plant and equipment, net and Operating lease right-of-use assets and are shown by location of the assets. At December 31, 2023, approximately 19 percent, 11 percent and 9 percent of the Company's long-lived assets were located in the United States, China and Switzerland, respectively. At December 31, 2022, approximately 20 percent, 13 percent and 8 percent of the Company's long-lived assets were located in the United States, China and Switzerland, respectively.

—

Note 24
Subsequent events

Debt

On January 15, 2024, the Company issued the following EUR Instruments: (i) EUR 500 million 3.125 percent Notes, due 2029, and (ii) EUR 750 million 3.375 percent Notes, due 2034, both paying interest annually in arrears. The aggregate net proceeds of these EUR Instruments, after discount and fees, amounted to EUR 1,243 million (equivalent to approximately $1,360 million on date of issuance).

Stockholders' equity

In February 2024, the Company announced that a proposal will be put to the 2024 AGM for approval by the shareholders to distribute 0.87 Swiss francs per share to shareholders.

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ABB Ltd Management Report 2023

ABB Ltd is the holding company of the ABB Group, owning directly or indirectly all subsidiaries globally. The major business activities during 2023 can be summarized as follows:

Management services

The Company provided management services to Group companies for CHF 26 million.

Share transactions

- share deliveries in relation to employee share programs of CHF 302 million
- share cancellations of CHF 2,390 million: those shares were repurchased under share buyback programs in 2022 and 2023
- share repurchases of CHF 804 million for cancellation purposes
- share repurchases for employee share programs of CHF 310 million

Dividend distribution to external shareholders

- from retained earnings of CHF 1,404 million

Dividend received from subsidiaries

As planned, ABB Asea Brown Boveri Ltd did not distribute any dividend to ABB Ltd in 2023. This contributed to a Net loss of CHF 86 million in 2023.

Other information

In 2023, the Company employed on average 19 employees.

Once a year, the Company's Board of Directors performs a risk assessment in accordance with the Group's risk management process and discusses appropriate actions if necessary.

The Company does not carry out any research and development activities.

In 2024, the Company will continue to operate as the holding company of the ABB Group. No change of business is expected.

February 22, 2024

Financial Statements 2023

Income Statement

Year ended December 31 (CHF in thousands)	Note	2023	2022
Dividend income	7	—	4,504,256
Finance income		126,228	141,294
Other operating income	8	31,718	51,730
Gain on sale of participation	2	536	55,199
Total income		**158,482**	**4,752,479**
Personnel expenses		(58,981)	(50,789)
Finance expense		(169,504)	(282,552)
Other operating expenses	9	(15,705)	(340,983)
Total expenses		**(244,190)**	**(674,324)**
Net (loss)/income before taxes		**(85,708)**	**4,078,155**
Income taxes		—	(153)
Net (loss)/income		**(85,708)**	**4,078,002**

Balance Sheet

December 31 (CHF in thousands)	Note	2023	2022
Cash		545	282,220
Cash deposit with ABB Capital Ltd		189,664	406,029
Non-trade receivables		81	1,220
Non-trade receivables – Group		48,750	11,495
Short-term loans – Group		271,814	1,423,060
Accrued income and prepaid expenses		1,440	223
Accrued income and prepaid expenses – Group		195	672
Total current assets		**512,489**	**2,124,919**
Long-term loans – Group		—	299,780
Participations	2	5,709,367	5,709,367
Other non-current assets		5,102	3,816
Total non-current assets		**5,714,469**	**6,012,963**
Total assets		**6,226,958**	**8,137,882**
Interest-bearing liabilities	4	280,013	275,000
Interest-bearing liabilities – Group	4	271,814	23,060
Non-trade payables		29,974	40,022
Non-trade payables – Group		1,696	6,138
Current provisions		35,030	60,102
Deferred income and accrued expenses		33,109	14,449
Deferred income and accrued expenses – Group		12,520	24,862
Total current liabilities		**664,156**	**443,633**
Interest-bearing liabilities	4	1,645,534	1,175,698
Interest-bearing liabilities – Group	4	—	299,780
Total non-current liabilities		**1,645,534**	**1,475,478**
Total liabilities		**2,309,690**	**1,919,111**
Share capital	6	225,840	235,769
Legal reserves from retained earnings	6	1,000,000	1,000,000
Treasury shares	6	(1,290,941)	(2,869,196)
Available earnings			
Retained earnings	6	4,068,077	3,774,196
Net (loss)/income		(85,708)	4,078,002
Total stockholders' equity		**3,917,268**	**6,218,771**
Total liabilities and stockholders' equity		**6,226,958**	**8,137,882**

Notes to Financial Statements

Note 1
General

ABB Ltd, Zurich, Switzerland (the Company) is the parent company of the ABB Group. Its stand-alone financial statements are prepared in accordance with Article 957 et seqq. of Title 32 of the Swiss Code of Obligations.

Group companies are all companies which are directly or indirectly controlled by the Company and any variable interest entities if it is determined that the Company is the primary beneficiary.

Note 2
Participations

			2023		2022	
Company name	Purpose	Domicile	Share capital	Ownership and voting rights	Share capital	Ownership and voting rights
ABB Asea Brown Boveri Ltd	Holding	CH-Zurich	CHF 2,767,880,000	100.00%	CHF 2,767,880,000	100.00%

Participations are valued at the lower of cost or fair value, using generally accepted valuation principles.

On July 1, 2020, the Company completed the sale of 80.1 percent of Hitachi Energy Ltd (formerly Hitachi ABB Power Grids Ltd). The transaction was executed through the sale of 80.1 percent of the shares of Hitachi Energy Ltd. In September 2022, the Company and Hitachi agreed terms to sell the Company's remaining investment in Hitachi Energy Ltd to Hitachi and simultaneously settle certain outstanding contractual obligations relating to the initial sale of the Power Grids business. The sale of the remaining investment was completed in December 2022, resulting in net cash proceeds of CHF 1,440 million and a gain of CHF 55 million which was recorded in "Gain on sale of participations".

Note 3
Indirect Participations

The following table sets forth the name, country of incorporation, ownership and voting rights, as well as share capital, of the significant indirect subsidiaries of the Company, as of December 31, 2023 and 2022.

Company name/Location	Country	Company ownership and voting rights % 2023	Share capital in thousands 2023	Company ownership and voting rights % 2022	Share capital in thousands 2022	Currency
ABB Australia Pty Limited, Moorebank	Australia	100.00	131,218	100.00	131,218	AUD
ABB Group Holdings Pty. Ltd., Moorebank	Australia	100.00	537,988[(8)]	100.00	552,982	AUD
ABB Group Investment Management Pty. Ltd., Moorebank	Australia	100.00	520,318[(8)]	100.00	505,312	AUD
ABB AG, Wiener Neudorf	Austria	100.00	15,000	100.00	15,000	EUR
B&R Holding GmbH, Eggelsberg	Austria	100.00	35	100.00	35	EUR
B&R Industrial Automation GmbH, Eggelsberg	Austria	100.00	1,240	100.00	1,240	EUR
ABB N.V., Zaventem	Belgium	100.00	4,000	100.00	4,000	EUR
ABB AUTOMAÇÃO LTDA., Sorocaba	Brazil	100.00	191,039	100.00	191,039	BRL

Company name/Location	Country	Company ownership and voting rights % 2023	Share capital in thousands 2023	Company ownership and voting rights % 2022	Share capital in thousands 2022	Currency
ABB ELETRIFICAÇÃO LTDA., Sorocaba	Brazil	100.00	268,759	100.00	268,759	BRL
ABB Bulgaria EOOD, Sofia	Bulgaria	100.00	65,110	100.00	65,110	BGN
ABB Electrification Canada Inc., Saint-Laurent[2]	Canada	100.00	—[1]	100.00	—[1]	CAD
ABB Inc., Saint-Laurent	Canada	100.00	—[1]	100.00	—[1]	CAD
ABB S.A., Santiago	Chile	100.00	5,484,348	100.00	5,484,348	CLP
ABB (China) Investment Limited, Beijing	China	100.00	95,000	100.00	95,000	USD
ABB (China) Ltd., Beijing	China	100.00	140,000	100.00	140,000	USD
ABB Beijing Drive Systems Co. Ltd., Beijing	China	90.00	5,000	90.00	5,000	USD
ABB Beijing Switchgear Limited, Beijing	China	60.00	16,500	60.00	16,500	USD
ABB Electrical Machines Ltd., Shanghai	China	100.00	14,400	100.00	14,400	USD
ABB Engineering (Shanghai) Ltd., Shanghai	China	100.00	40,000	100.00	40,000	USD
ABB LV Installation Materials Co. Ltd. Beijing, Beijing	China	85.70	17,100	85.70	17,100	USD
ABB Shanghai Free Trade Zone Industrial Co., Ltd., Shanghai	China	100.00	6,500	100.00	6,500	CNY
ABB Shanghai Motors Co. Ltd., Shanghai	China	75.00	11,217	75.00	11,217	USD
ABB Xiamen Low Voltage Equipment Co. Ltd., Xiamen	China	100.00	15,800	100.00	15,800	USD
ABB Xiamen Switchgear Co. Ltd., Xiamen	China	66.52	29,500	66.52	29,500	USD
ABB Xinhui Low Voltage Switchgear Co. Ltd., Xinhui	China	90.00	6,200	90.00	6,200	USD
ABB s.r.o., Prague	Czech Republic	100.00	400,000	100.00	400,000	CZK
ABB A/S, Skovlunde	Denmark	100.00	100,000	100.00	100,000	DKK
ABB for Electrical Industries (ABB ARAB) S.A.E., Cairo	Egypt	100.00	353,479	100.00	353,479	EGP
Asea Brown Boveri S.A.E., Cairo	Egypt	100.00	166,000	100.00	166,000	USD
ABB AS, Jüri	Estonia	100.00	1,663	100.00	1,663	EUR
ABB Oy, Helsinki	Finland	100.00	10,003	100.00	10,003	EUR
ABB France, Cergy Pontoise	France	99.84	25,778	99.84	25,778	EUR
ABB SAS, Cergy Pontoise	France	100.00	45,921	100.00	45,921	EUR
ABB AG, Mannheim	Germany	100.00	167,500	100.00	167,500	EUR
ABB Beteiligungs- und Verwaltungsgesellschaft mbH, Mannheim	Germany	100.00	61,355	100.00	61,355	EUR
ABB Stotz-Kontakt GmbH, Heidelberg	Germany	100.00	7,500	100.00	7,500	EUR
ABB Striebel & John GmbH, Sasbach	Germany	100.00	1,050	100.00	1,050	EUR
B + R Industrie-Elektronik GmbH, Bad Homburg	Germany	100.00	358	100.00	358	EUR
Busch-Jaeger Elektro GmbH, Lüdenscheid	Germany	100.00	1,535	100.00	1,535	EUR
ABB Engineering Trading and Service Ltd., Budapest	Hungary	—[3]	—[3]	100.00	436,281	HUF
ABB Global Business Services and Contracting India Private Limited, Bangalore	India	100.00	5,200,100	100.00	5,200,100	INR
ABB Global Industries and Services Private Limited, Bangalore	India	100.00	366,923	100.00	366,923	INR
ABB India Limited, Bangalore	India	75.00	423,817	75.00	423,817	INR
ABB Limited, Dublin	Ireland	100.00	635	—[3]	—[3]	EUR
ABB E-mobility S.p.A., Milan	Italy	74.70	20,000	91.56	20,000	EUR
ABB S.p.A., Milan	Italy	100.00	110,000	100.00	110,000	EUR
ABB K.K., Tokyo	Japan	100.00	1,000,000	100.00	1,000,000	JPY
ABB Ltd., Seoul	Korea, Republic of	100.00	23,670,000	100.00	23,670,000	KRW
ABB Electrical Control Systems S. de R.L. de C.V., Monterrey	Mexico	100.00	712,463	100.00	712,463	MXN
ABB Mexico S.A. de C.V., San Luis Potosi	Mexico	100.00	1,135,752	100.00	1,135,752	MXN
Asea Brown Boveri S.A. de C.V., San Luis Potosi	Mexico	100.00	667,686	100.00	667,686	MXN
ABB B.V., Rotterdam	Netherlands	100.00	9,200	100.00	9,200	EUR
ABB E-mobility B.V., Delft	Netherlands	74.70	1	91.56	1	EUR
ABB Finance B.V., Rotterdam	Netherlands	100.00	20	100.00	20	EUR
ABB Holdings B.V., Rotterdam	Netherlands	100.00	363	100.00	363	EUR
ABB AS, Fornebu	Norway	100.00	134,550	100.00	134,550	NOK
ABB Electrification Norway AS, Skien	Norway	100.00	60,450	100.00	60,450	NOK
ABB Holding AS, Fornebu	Norway	100.00	240,000	100.00	240,000	NOK
ABB Business Services Sp. z o.o., Warsaw	Poland	99.94	24	99.94	24	PLN
ABB Industrial Solutions (Klodzko) Sp. z o.o., Klodzko	Poland	—[3]	—[3]	99.94	50	PLN
ABB Sp. z o.o., Warsaw	Poland	99.94	245,461	99.94	245,461	PLN

Company name/Location	Country	Company ownership and voting rights % 2023	Share capital in thousands 2023	Company ownership and voting rights % 2022	Share capital in thousands 2022	Currency
Industrial C&S of P.R. LLC, Arecibo[5]	Puerto Rico	100.00	—[1]	100.00	—[1]	USD
ABB Electrical Industries Co. Ltd., Riyadh	Saudi Arabia	65.00	181,000	65.00	181,000	SAR
ABB Pte. Ltd., Singapore	Singapore	100.00	32,797	100.00	32,797	SGD
ABB Holdings (Pty) Ltd., Modderfontein	South Africa	100.00	217,758	100.00	217,758	ZAR
ABB Investments (Pty) Ltd., Modderfontein	South Africa	51.00	185,978	51.00	185,978	ZAR
ABB South Africa (Pty) Ltd., Modderfontein	South Africa	74.91	3,835,544	74.91	261,000	ZAR
Asea Brown Boveri S.A., Madrid	Spain	100.00	33,318	100.00	33,318	EUR
ABB AB, Västerås	Sweden	100.00	200,000	100.00	200,000	SEK
ABB Electrification Sweden AB, Västerås	Sweden	100.00	10,000	100.00	10,000	SEK
ABB Norden Holding AB, Västerås	Sweden	100.00	2,344,783	100.00	2,344,783	SEK
ABB Canada EL Holding GmbH, Zurich	Switzerland	—[4]	—[4]	100.00	1,000	CHF
ABB Capital AG, Zurich	Switzerland	100.00	100	100.00	100	CHF
ABB E-mobility Holding Ltd, Zurich[6]	Switzerland	74.70	1,138	91.56	1,003	CHF
ABB Information Systems Ltd., Zurich	Switzerland	—[3]	—[3]	100.00	500	CHF
ABB Management Services Ltd., Zurich	Switzerland	—[3]	—[3]	100.00	571	CHF
ABB Schweiz AG, Baden	Switzerland	100.00	55,000	100.00	55,000	CHF
ABB Ltd., Taipei	Taiwan (Chinese Taipei)	100.00	195,000	100.00	195,000	TWD
ABB Elektrik Sanayi A.S., Istanbul	Turkiye	99.99	165,000	99.99	240,076	TRY
ABB Industries (L.L.C.), Dubai	United Arab Emirates	49.00[7]	5,000[7]	49.00[7]	5,000[7]	AED
ABB Industries FZE, Dubai	United Arab Emirates	100.00	3,000	—[3]	—[3]	AED
ABB Holdings Limited, Warrington	United Kingdom	100.00	226,014	100.00	226,014	GBP
ABB Limited, Warrington	United Kingdom	100.00	120,000	100.00	120,000	GBP
ABB E-mobility Inc., Wilmington, DE	United States	74.70	—[1]	91.56	—[1]	USD
ABB Finance (USA) Inc., Wilmington, DE	United States	100.00	1	100.00	1	USD
ABB Holdings Inc., Cary, NC	United States	100.00	2	100.00	2	USD
ABB Inc., Cary, NC	United States	100.00	1	100.00	1	USD
ABB Installation Products Inc., Memphis, TN	United States	100.00	1	100.00	1	USD
ABB Motors and Mechanical Inc., Fort Smith, AR	United States	100.00	—[1]	100.00	—[1]	USD
ABB Treasury Center (USA), Inc., Wilmington, DE	United States	100.00	1	100.00	1	USD
Edison Holding Corporation, Wilmington, DE	United States	100.00	—[1]	100.00	—[1]	USD
Industrial Connections & Solutions LLC, Cary, NC	United States	100.00	—[1]	100.00	—[1]	USD

(1) Shares without par value.
(2) In 2023, name and location changed from ABB Electrification Canada ULC, Edmonton to ABB Electrification Canada Inc., Saint-Laurent.
(3) Based on the internally defined thresholds, these indirect participations are considered not significant, and therefore no details to these participations are disclosed in the respective year.
(4) Participation was either sold, liquidated or merged in 2023.
(5) In 2023, location changed from San Juan to Arecibo.
(6) In 2023, location changed from Baden to Zurich.
(7) Company consolidated as ABB exercises full management control.
(8) Share capital adjusted to current facts and circumstances.

Note 4
Interest-bearing liabilities

December 31 (CHF in thousands)		2023	2022
Bonds 2019 – 2024 0.3% coupon	nominal value	280,000	280,000
	premium on issuance	13	34
Bonds 2019 – 2029 1.0% coupon	nominal value	170,000	170,000
	premium on issuance	115	135
Bonds 2022 – 2023 zero interest	nominal value	—	275,000
	premium on issuance	—	—
Bonds 2022 – 2027 0.75% coupon	nominal value	425,000	425,000
	premium on issuance	393	496
Bonds 2022 – 2025 2.10% coupon	nominal value	150,000	150,000
	premium on issuance	7	11
Bonds 2022 – 2030 2.375% coupon	nominal value	150,000	150,000
	premium on issuance	19	22
Bonds 2023 – 2026 1.965% coupon	nominal value	325,000	—
	premium on issuance	—	—
Bonds 2023 – 2028 1.9775% coupon	nominal value	150,000	—
	premium on issuance	—	—
Bonds 2023 – 2033 2.1125% coupon	nominal value	275,000	—
	premium on issuance	—	—
Loan 2016 – 2024 $325 million (in 2022 $350 million)		271,814	322,840
Total		**2,197,361**	**1,773,538**

Bonds are valued at nominal value. Any bond premium is accrued over the duration of the bond so that at maturity, the balance sheet amount will equal the amount that is due to be paid.

In September 2023, the Company repaid its CHF 275 million of zero interest bonds at maturity.

In September 2023, the Company issued the following bonds: (i) CHF 325 million 1.965% bonds due in 2026, (ii) CHF 150 million 1.9775% bonds due in 2028 and (iii) CHF 275 million 2.1125% bonds due in 2033. Each of the respective bonds pays interest annually. The Company has the option, three months before their maturity date, to redeem each of these bonds, in whole but not in part, at par plus accrued interest. Further, the Company has the option to redeem the above bonds prior to maturity, in whole but not in part, at par plus accrued interest, if 85% or more of the aggregate principal amount of the relevant bond issue has been redeemed or purchased and cancelled at the time of the option exercise notice.

In October 2022, the Company issued the following bonds: (i) CHF 150 million 2.1% bonds due in 2025 and (ii) CHF 150 million 2.375% bonds due in 2030. Each of the respective bonds pays interest annually. The Company has the option, three months before their maturity date, to redeem each of these bonds, in whole but not in part, at par plus accrued interest. Further, the Company has the option to redeem the above bonds prior to maturity, in whole but not in part, at par plus accrued interest, if 85% or more of the aggregate principal amount of the relevant bond issue has been redeemed or purchased and cancelled at the time of the option exercise notice.

In March 2022, the Company issued the following bonds: (i) CHF 275 million zero interest bonds due in 2023 and (ii) CHF 425 million 0.75% bonds due in 2027. The 0.75% coupon on the CHF 425 million bonds is paid annually. The Company has the option, one month before their maturity date to redeem the 2027 bonds, in whole but not in part, at par plus accrued interest. Further, the Company has the option to redeem the 2027 bonds prior to maturity, in whole but not in part, at par plus accrued interest, if 85% or more of the aggregate principal amount of the relevant bond issue has been redeemed or purchased and cancelled at the time of the option exercise notice.

In February 2019, the Company issued the following bonds: (i) CHF 280 million 0.3% bonds due in 2024 and (ii) CHF 170 million 1.0% bonds due in 2029. Each of the respective bonds pays interest annually in August and May respectively. The Company has the option, one month before their maturity date in case of the 2024 bonds and three months before their maturity date in the case of the 2029 bonds, to redeem the bonds, in whole but not in part, at par plus accrued interest. Further, the Company has the option to redeem the above bonds prior to maturity, in whole but not in part, at par plus accrued interest, if 85% or more of the aggregate principal amount of the relevant bond issue has been redeemed or purchased and cancelled at the time of the option exercise notice.

In 2016, the Company entered into a borrowing agreement of USD 500 million with ABB Capital Ltd that expires in 2024 (with an amortization schedule of USD 25 million per annum) to hedge a USD 500 million loan granted to a Group company. In each of 2023 and 2022, the Company repaid USD 25 million. The average interest in 2023 and 2022 was 6.01% and 2.65%, respectively.

Note 5
Contingent liabilities

With certain Group companies, the Company has keep-well agreements. A keep-well agreement is a shareholder agreement between the Company and a Group company. These agreements provide for maintenance of a minimum net worth in the Group company and the maintenance of 100% direct or indirect ownership by the Company.

The keep-well agreements additionally provide that if at any time the Group company has insufficient liquid assets to meet any payment obligation on its debt (as defined in the agreements) and has insufficient unused commitments under its credit facilities with its lenders, the Company will make available to the Group company sufficient funds to enable it to fulfill such payment obligation as it falls due. A keep-well agreement is not a guarantee by the Company for payment of the indebtedness, or any other obligation, of a Group company. No party external to the ABB Group is a party to any keep-well agreement.

The Company has also provided certain guarantees securing the performance of Group companies in connection with commercial paper programs, indentures or other debt instruments to enable them to fulfill the payment obligations under such instruments as they fall due. The amount guaranteed under these instruments was CHF 4,534 million as of December 31, 2023, and CHF 5,590 million as of December 31, 2022.

Additionally, the Company has provided certain guarantees securing the performance of contracts and undertakings of Group companies with third parties entered into in the normal course of business with an aggregate value of CHF 67 million as per December 31, 2023, and CHF 73 million as per December 31, 2022.

Furthermore, the Company is the guarantor in the Group's USD 2 billion multicurrency revolving credit facility ("Group Facility"). In December 2019, the Group Facility maturing in 2021 was replaced with a new Group Facility maturing in 2024, with the option in 2020 and 2021 to extend the maturity to 2025 and 2026, respectively. The Company exercised its option in 2021 to extend the maturity of the facility to 2026. No amounts were drawn under this Group Facility at December 31, 2023 and 2022.

The Company through certain of its direct and indirect subsidiaries is involved in various regulatory and legal matters. The Company's direct and indirect subsidiaries have made certain related provisions as further described in "Note 15 Commitments and contingencies" to the Consolidated Financial Statements of ABB Ltd. As described in the note, there is a risk of adverse outcomes beyond the provisioned amounts.

The Company is part of a value added tax Group and therefore is jointly liable to the Swiss Federal Tax Department for the value added tax liabilities of the other members.

Note 6
Stockholders' equity

(CHF in thousands)	Share capital	Legal reserves from retained earnings	Available earnings from retained earnings	Available earnings Net (loss) /income	Treasury shares	Total
Opening balance at January 1, 2023	**235,769**	**1,000,000**	**3,774,196**	**4,078,002**	**(2,869,196)**	**6,218,771**
Allocation to retained earnings			4,078,002	(4,078,002)		—
Cancellation of shares	(9,929)		(2,380,048)		2,389,977	—
Dividend payment CHF 0.84 per share			(1,404,073)			**(1,404,073)**
Purchases of treasury shares					(1,113,817)	**(1,113,817)**
Delivery of treasury shares					302,095	**302,095**
Net (loss)/income for the year				(85,708)		**(85,708)**
Closing balance at December 31, 2023	**225,840**	**1,000,000**	**4,068,077**	**(85,708)**	**(1,290,941)**	**3,917,268**

Share capital as of December 31, 2023	Number of registered shares	Par value (CHF)	Total (CHF in thousands)
Issued shares	1,882,002,575	0.12	225,840
Contingent shares	304,038,800	0.12	36,485
Authorized shares(1)	n.a.	n.a.	n.a.
Capital Band available increase	196,474,500	0.12	23,577
Capital Band available decrease	(113,732,000)	0.12	(13,648)
Share capital as of December 31, 2022	**Number of registered shares**	**Par value (CHF)**	**Total (CHF in thousands)**
Issued shares	1,964,745,075	0.12	235,769
Contingent shares	304,038,800	0.12	36,485
Authorized shares	200,000,000	0.12	24,000

'(1) The authorized share capital expired in 2023 and was replaced by the capital band.

On September 7, 2022, the shareholders approved the spin-off of the Group's Turbocharging Division into an independent, publicly traded company, Accelleron Industries AG (Accelleron), which was completed through the distribution of common stock of Accelleron to the stockholders of the Company on October 3, 2022.

In connection with the spin-off of the Turbocharging Division in October 2022, the strike prices of the options outstanding under the MIP program were reduced to adjust for the effect of the spin-off on the Company's share price. At December 31, 2022, MIP options issued in 2017, 2018 and 2019 were outstanding and had new strike prices of CHF 21.23, CHF 22.05, and CHF 17.63, respectively.

Treasury shares are valued at acquisition cost. During 2023 and 2022, a loss from the delivery of treasury shares of CHF 46 million and CHF 121 million, respectively, was recorded in the Income Statement under Finance expense.

During 2023, a bank holding call options related to ABB Group's management incentive plan (MIP) exercised a portion of these options. Such options had been issued in 2017 and 2019 by the Group company that facilitates the MIP at fair value and had adjusted strike prices of CHF 21.23 and CHF 17.63, respectively. At issuance, the Group company had entered into an intercompany option agreement with the Company, having the same terms and conditions to enable it to meet its future obligations. As a result of the exercise by the bank, the Company delivered 1,440,850 shares at CHF 21.23 and 4,082,844 shares at CHF 17.63, out of treasury shares. During 2022, a bank holding call options related to ABB Group's management incentive plan (MIP) exercised a portion of these options. Such options had been issued in 2016, 2017 and 2019 by the Group company that facilitates the MIP at fair value and had strike prices of CHF 21.50, CHF 22.50, and CHF 19.00, respectively. At issuance, the Group company had entered into an intercompany option agreement with the Company, having the same terms and conditions to enable it to meet its future obligations. As a result of the exercise by the bank, the Company delivered to the bank 2,048,984 shares at CHF 21.50, 12,836,201 shares at CHF 22.50 and 1,398,083 shares at CHF 19.00, out of treasury shares.

The ABB Group has an annual employee share acquisition plan (ESAP) which provides share options to employees globally. To enable the Group company that facilitates the ESAP to deliver shares to employees who have exercised their stock options under the ESAP, the Group company entered into an agreement with the Company to acquire the required number of shares at their then market value from the Company.

Consequently, in 2023, the Company delivered, out of treasury shares, to the Group company 1,266,178 shares at CHF 33.54. In 2022, the Company delivered, out of treasury shares, to the Group company 105,138 shares at CHF 29.78.

In 2023 and 2022, the Company transferred 3,484,043 and 1,665,025 treasury shares at an average acquisition price per share of CHF 29.16 and CHF 29.28, respectively, to fulfill its obligations under other share-based arrangements.

In 2023, the Company purchased 9 million shares, for CHF 310 million, to support its employee share programs globally and 25 million shares, for CHF 804 million, as part of its share buyback programs for capital reduction purposes announced on March 31, 2023, and March 31, 2022. In 2022, the Company purchased 20 million shares, for CHF 616 million, to support its employee share programs globally and 91 million shares, for CHF 2,690 million, as part of its share buyback programs for capital reduction purposes announced on March 31, 2022, and April 8, 2021.

Following the introduction of a capital band as approved by the Company's shareholders at its Annual General Meeting 2023, the Company has a capital band ranging from CHF 212 million (lower limit) to CHF 259 million (upper limit). The Board of Directors is authorized within the capital band to increase or reduce the share capital once or several times and in any amounts or to acquire or dispose of shares directly or indirectly, until March 23, 2028, or until an earlier expiry of the capital band.

In 2023, the Board of Directors resolved to cancel under the above referred capital band 82,742,500 shares repurchased under ABB's 2021-22 and 2022-23 share buyback programs. These shares were cancelled in May 2023, resulting in a reduced total number of issued ABB Ltd shares of 1,882,002,575, and a decrease of CHF 2,390 million in treasury shares and a corresponding combined decrease in share capital and retained earnings.

The movement in the number of treasury shares during the year was as follows:

	2023		2022	
	Number of shares	Average acquisition price per share (in CHF)	Number of shares	Average acquisition price per share (in CHF)
Opening balance as of January 1	**99,741,744**	**28.77**	**94,803,864**	**30.09**
Purchases for employee share programs	9,100,000	34.08	20,000,000	30.80
Purchases for intended cancellation	24,670,000	32.58	91,394,500	29.44
Cancellation	(82,742,500)	28.88	(88,403,189)	31.22
Delivery for employee share programs	(10,273,915)	29.40	(18,053,431)	29.34
Closing balance as of December 31	**40,495,329**	**31.88**	**99,741,744**	**28.77**
Thereof pledged for MIP	2,919,226		3,547,102	

Note 7
Dividend income

As planned, the Company did not receive any dividend payments in 2023 from ABB Asea Brown Boveri Ltd. In 2022, the Company received dividend payments from ABB Asea Brown Boveri Ltd of CHF 4.0 billion in cash and CHF 504 million in kind.

Note 8
Other operating income

Other operating income includes mainly outgoing charges for Business Area and Division management services, income from share deliveries and guarantee compensation fees to Group companies.

Note 9
Other operating expenses

In 2023, Other operating expenses included usual operating expenses. In 2022, Other operating expenses included CHF 301 million for regulatory penalties in connection with the Kusile project.

Note 10
Shareholdings of Board members and Executive Committee members

At December 31, 2023 and 2022, the members of the Board of Directors as of that date, held the following numbers of shares:

Board ownership of ABB shares	Total numbers of shares held	
Name	December 31, 2023	December 31, 2022
Peter Voser	215,876	231,807
Jacob Wallenberg	251,318	245,898
Gunnar Brock	41,785	37,813
David Constable	46,319	42,465
Frederico Curado	57,181	49,175
Lars Förberg	80,095	70,522
Denise Johnson	3,929	—
Jennifer Xin-Zhe Li	45,812	41,904
Geraldine Matchett	36,023	30,964
David Meline[(1)]	47,948	43,131
Satish Pai	—	34,827
Total	**826,286**	**828,506**

(1) Includes 3,150 shares held by the spouse.

At December 31, 2023, the members of the Executive Committee as of that date, held the following number of shares, the conditional rights to receive ABB shares under the Long-term Incentive Plan (LTIP) and unvested shares in respect of other compensation arrangements.

		Unvested at December 31, 2023		
Name	Total number of shares held at December 31, 2023	Reference number of shares deliverable under the 2021 performance factors (EPS and TSR) of the LTIP[(1)] (vesting 2024)	Reference number of shares deliverable under the 2022 performance factors (EPS, TSR and sustainability) of the LTIP[(1)] (vesting 2025)	Reference number of shares deliverable under the 2023 performance factors (EPS, TSR and sustainability) of the LTIP[(1)] (vesting 2026)
Björn Rosengren	262,334	99,450	85,487	85,708
Timo Ihamuotila	202,000	37,830	31,609	31,691
Carolina Granat[(2)]	5,200	27,301	23,148	23,208
Karin Lepasoon	360	—	19,157	19,207
Sami Atiya	100,000	31,201	25,543	25,609
Tarak Mehta	134,710	36,271	29,694	29,770
Peter Terwiesch	100,000	31,201	26,501	27,529
Morten Wierod	141,267	31,201	28,736	31,210
Total Executive Committee members at December 31, 2023	**945,871**	**294,455**	**269,875**	**273,932**

(1) The final 2020 LTIP, 2021 LTIP and 2022 LTIP awards will be settled 100 percent in shares, with an automatic sell-to-cover in place for employees who are subject to withholding taxes.

(2) This includes 1,200 shares held by the spouse.

At December 31, 2022, the members of the Executive Committee, as of that date, held the following number of shares, the conditional rights to receive ABB shares under the Long-term Incentive Plan (LTIP) and unvested shares in respect of other compensation arrangements.

		Unvested at December 31, 2022			
Name	**Total number of shares held at December 31, 2022**	**Reference number of shares deliverable under the 2020 performance factors (EPS and TSR) of the LTIP[(1)(2)] (vesting 2023)**	**Reference number of shares deliverable under the 2021 performance factors (EPS and TSR) of the LTIP[(1)(2)] (vesting 2024)**	**Reference number of shares deliverable under the 2022 performance factors (EPS, TSR and sustainability) of the LTIP[(1)(2)] (vesting 2025)**	**Replacement share grant for foregone benefits from former employer[(2)(3)] (vesting 2023)**
Björn Rosengren	94,597	136,589	99,450	85,487	19,604
Timo Ihamuotila	189,034	50,887	37,830	31,609	—
Carolina Granat[(4)]	5,200	—	27,301	23,148	—
Andrea Antonelli (EC member as of March 1, 2022)	—	—	7,021	33,525	—
Karin Lepasoon (EC member as of October 1, 2022)	—	—	—	19,157	—
Sami Atiya[(5)]	90,473	42,852	31,201	25,543	—
Tarak Mehta	152,993	48,209	36,271	29,694	—
Peter Terwiesch	132,940	42,852	31,201	26,501	—
Morten Wierod	64,777	40,174	31,201	28,736	—
Total Executive Committee members at December 31, 2022	**730,014**	**361,563**	**301,476**	**303,400**	**19,604**

(1) The final 2020 LTIP, 2021 LTIP and 2022 LTIP awards will be settled 100 percent in shares, with an automatic sell-to-cover in place for employees who are subject to withholding taxes.

(2) Initial number of shares granted have been increased by 3.7 percent to reflect the impact of the spin-off of the Accelleron business.

(3) The replacement share grant was settled 65 percent in shares and 35 percent in cash.

(4) This includes 1,200 shares held by the spouse.

(5) The disclosure of the number of shares granted under the LTIP 2022 has been corrected, reducing the number by 958.

Note 11
Full time employees

During each of 2023 and 2022, the Company employed on average 19 employees.

At ABB, we believe that a culture of diversity, inclusion and equal opportunity is critical to our business success and makes us stronger. ABB has non-discriminatory pay policies which play an important part in minimizing any pay disparities based on gender.

Note 12
Subsequent events

Subsequent to December 31, 2023, and up to February 15, 2024, the Company purchased, under the 2023-2024 share buyback program, an additional 4 million shares, for approximately CHF 153 million. Any further purchases up to February 22, 2024, are not considered significant for the Company.

Proposed appropriation of available earnings

Proposed appropriation of available earnings (CHF in thousands)	2023	2022
Net (loss)/income for the year	(85,708)	4,078,002
Carried forward from previous year	6,448,125	7,024,633
Cancellation of shares	(2,380,048)	(2,749,338)
Extraordinary dividend 2022	—	(501,099)
Available earnings to the Annual General Meeting	**3,982,369**	**7,852,198**
Gross dividend of CHF 0.84 per share paid directly by the Company(1)	—	(1,404,073)
Gross dividend of CHF 0.87 per share on total number of registered shares(1)	(1,637,342)	—
Balance to be carried forward	**2,345,027**	**6,448,125**

(1) No dividend will be paid on treasury shares held by ABB Ltd. Shareholders who are resident in Sweden participating in the established dividend access facility will receive an amount in Swedish kronor from ABB Norden Holding AB which corresponds to the dividend resolved on a registered share of ABB Ltd without deduction of the Swiss withholding tax. This amount however is subject to taxation according to Swedish law.

On February 1, 2024, the Company announced that the Board of Directors will recommend for approval at the March 21, 2024, Annual General Meeting that a dividend of CHF 0.87 per share be distributed out of the available earnings, expected to be paid in March and April 2024. As the legal reserves from retained earnings exceed 20% of the share capital, a further allocation has been waived.

Statutory Auditor's Report

To the General Meeting of ABB Ltd, Zurich

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of ABB Ltd (the Company), which comprise the balance sheet as at December 31, 2023, and the income statement for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the financial statements (pages 127 to 138) comply with Swiss law and the Company's articles of incorporation.

Basis for Opinion

We conducted our audit in accordance with Swiss law and Swiss Standards on Auditing (SA-CH). Our responsibilities under those provisions and standards are further described in the "Auditor's Responsibilities for the Audit of the Financial Statements" section of our report. We are independent of the Company in accordance with the provisions of Swiss law, together with the requirements of the Swiss audit profession and we have fulfilled our other ethical responsibilities in accordance with these requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements of the current period. We have determined that there are no key audit matters to communicate in our report.

Other Information

The Board of Directors is responsible for the other information. The other information comprises the information included in the ABB Annual Reporting Suite (consisting of the Integrated Report, the Financial Report, the Corporate Governance Report, the Sustainability report and the Compensation Report), but does not include the consolidated financial statements, the stand-alone financial statements of the Company, the compensation report and our auditor's reports thereon.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated.

If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Board of Directors' Responsibilities for the Financial Statements

The Board of Directors is responsible for the preparation of the financial statements in accordance with the provisions of Swiss law and the Company's articles of incorporation, and for such internal control as the Board of Directors determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

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

Auditor's Responsibilities for the Audit of the Financial Statements

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

As part of an audit in accordance with Swiss law and SA-CH, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made.

- Conclude on the appropriateness of the Board of Directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Company to cease to continue as a going concern.

We communicate with the Board of Directors or its relevant committee regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide the Board of Directors or its relevant committee with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, actions taken to eliminate threats or safeguards applied.

From the matters communicated with the Board of Directors or its relevant committee, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report, unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

Report on Other Legal and Regulatory Requirements

In accordance with article 728a para. 1 item 3 CO and PS-CH 890, we confirm that an internal control system exists, which has been designed for the preparation of financial statements according to the instructions of the Board of Directors.

We further confirm that the proposed appropriation of available earnings complies with Swiss law and the Company's articles of incorporation. We recommend that the financial statements submitted to you be approved.

KPMG AG

Achim Wolper
Licensed Audit Expert
Auditor in Charge

Mohammad Nafeie

Zurich, Switzerland
February 22, 2024

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EXPERTsuisse Certified Company

Caution concerning forward-looking statements

The ABB Financial Report 2023 includes “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. We have based these forward-looking statements largely on current expectations, estimates and projections about the factors that may affect our future performance, including global economic conditions as well as the economic conditions of the regions and the industries that are major markets for ABB. The words “believe,” “may,” “will,” “estimate,” “continue,” “target,” “anticipate,” “intend,” “expect”, “plan” and similar words and the express or implied discussion of strategy, plans or intentions are intended to identify forward-looking statements. These forward- looking statements are subject to risks, uncertainties and assumptions, including among other things, the following: (i) business risks related to the global volatile economic environment; (ii) costs associated with compliance activities; (iii) difficulties encountered in operating in emerging markets; (iv) risks inherent in large, long term projects served by parts of our business; (v) the timely development of new products, technologies, and services that are useful for our customers; (vi) our ability to anticipate and react to technological change and evolving industry standards in the markets in which we operate; (vii) changes in interest rates and fluctuations in currency exchange rates; (viii) changes in raw materials prices or limitations of supplies of raw materials; (ix) the weakening or unavailability of our intellectual property rights; (x) industry consolidation resulting in more powerful competitors and fewer customers; (xi) effects of competition and changes in economic and market conditions in the product markets and geographic areas in which we operate; (xii) effects of, and changes in, laws, regulations, governmental policies, taxation, or accounting standards and practices and (xiii) other factors described in documents that we may furnish from time to time with the US Securities and Exchange Commission, including our Annual Reports on Form 20-F. Although we believe that the expectations reflected in any such forward-looking statements are based on reasonable assumptions, we can give no assurance that they will be achieved. We undertake no obligation to update publicly or revise any forward-looking statements because of new information, future events or otherwise. In light of these risks and uncertainties, the forward-looking information, events and circumstances might not occur. Our actual results and performance could differ substantially from those anticipated in our forward-looking statements.

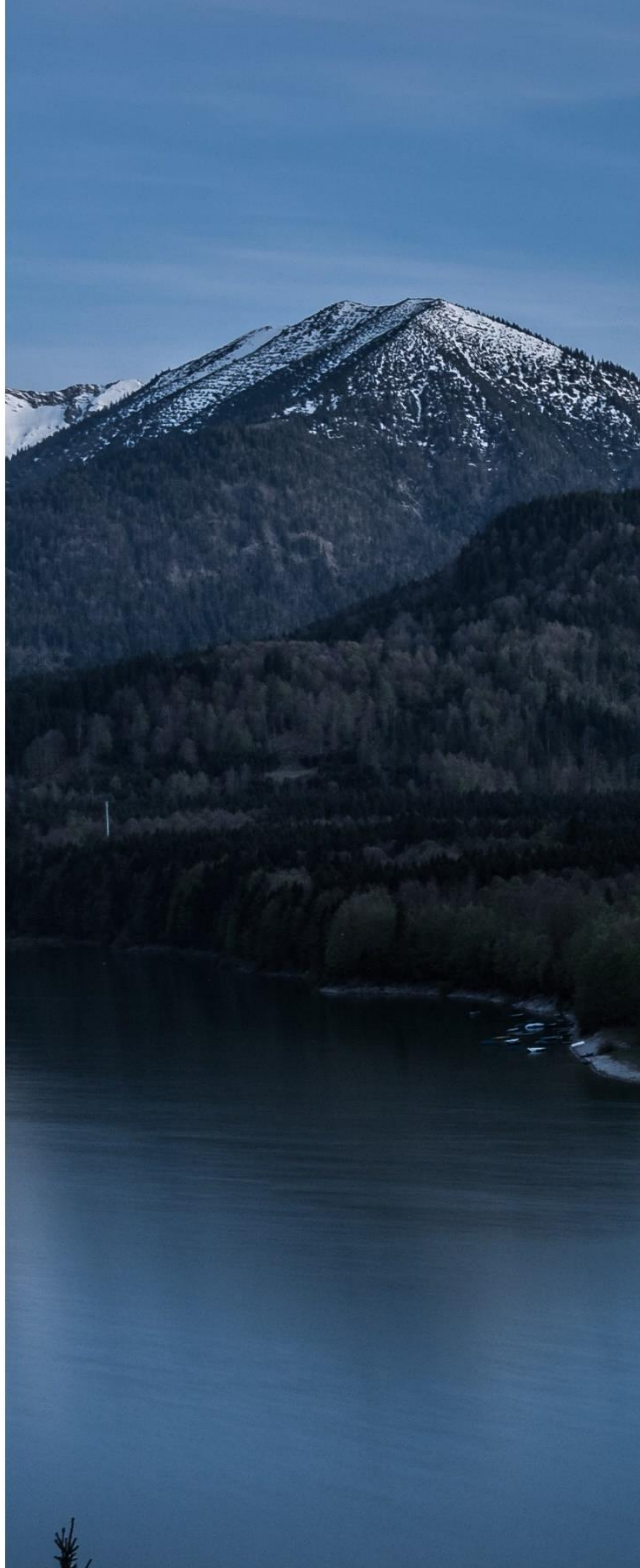
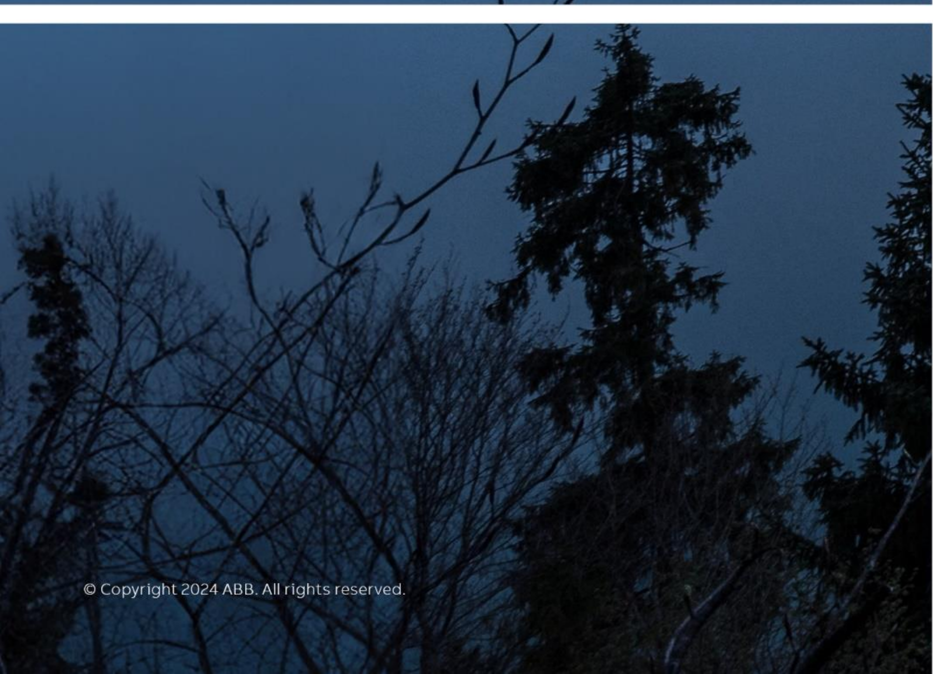


ABB Ltd.
Corporate Communications
Affolternstrasse 44
8050 Zurich
Switzerland

Tel: +41 (0)43 317 71 11

www.abb.com



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