

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

FORM 20-F

- ☐ **REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR (g) OF THE SECURITIES EXCHANGE ACT OF 1934**
OR
☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2022
OR
☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the transition period from _____ to _____
OR
☐ **SHELL COMPANY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
Date of event requiring this shell company report _____
Commission file number: 001-16429

ABB Ltd

(Exact name of registrant as specified in its charter)

Switzerland

(Jurisdiction of incorporation or organization)

Affolternstrasse 44

CH-8050, Zurich, Switzerland

(Address of principal executive offices)

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(Name, Telephone, E-mail and/or Facsimile number and Address of Company Contact Person)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
American Depositary Shares, each representing one Registered Share	ABB	New York Stock Exchange
Registered Shares, par value CHF 0.12	N/A	New York Stock Exchange*

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

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act: None.

Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the annual report:
1,865,003,331 Registered Shares

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

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934. Yes ☐ No ☒

Note – Checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 from their obligations under those Sections.

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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

Large accelerated filer ☒

Accelerated filer ☐

Non-accelerated filer ☐

Emerging growth company ☐

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

† The term "new or revised financial accounting standard" refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

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

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP ☒ International Financial Reporting Standards as issued by the International Accounting Standards Board ☐ Other ☐

If "Other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow.

Item 17 ☐ Item 18 ☐

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

* Listed on the New York Stock Exchange not for trading or quotation purposes, but only in connection with the registration of American Depositary Shares pursuant to the requirements of the Securities and Exchange Commission.

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Introduction

ABB Ltd is a corporation organized under the laws of Switzerland. In this Annual Report on Form 20-F (Annual Report), “the ABB Group,” “the Group,” “ABB,” the “Company,” “we,” “our” and “us” refer to ABB Ltd and its consolidated subsidiaries (unless the context otherwise requires). We also use these terms to refer to ABB Asea Brown Boveri Ltd and its subsidiaries prior to the establishment of ABB Ltd as the holding company for the entire ABB Group in 1999, as described in this Annual Report under “Item 4. Information on the Company—Introduction—History of the ABB Group”. Our American Depositary Shares (each representing one registered share of ABB Ltd) are referred to as “ADSs”. The registered shares of ABB Ltd are referred to as “shares”. Our principal corporate offices are located at Affolternstrasse 44, CH-8050 Zurich, Switzerland, telephone number +41-43-317-7111. Our internet address is www.abb.com or global.abb. The information contained on or accessible from our Web site is not incorporated into this annual report, and you should not consider it to be a part of this annual report.

Financial and other information

The Consolidated Financial Statements of ABB Ltd, including the Notes thereto, as of December 31, 2022 and 2021, and for each of the years in the three-year period ended December 31, 2022, (our Consolidated Financial Statements) have been prepared in accordance with United States generally accepted accounting principles (U.S. GAAP).

In this Annual Report: (i) “\$,” “U.S. dollar” and “USD” refer to the lawful currency of the United States of America; (ii) “CHF” and “Swiss franc” refer to the lawful currency of Switzerland; (iii) “EUR” and “euro” refer to the lawful currency of the participating member states of the European Economic and Monetary Union (Eurozone); (iv) “SEK” and “Swedish krona” refer to the lawful currency of Sweden; (v) “Chinese renminbi” and “CNY” refer to the lawful currency of the People’s Republic of China; and (vi) “INR” and “Indian Rupee” refer to the lawful currency of India.

Except as otherwise stated, all monetary amounts in this Annual Report are presented in U.S. dollars. Where specifically indicated, amounts in Swiss francs have been translated into U.S. dollars. These translations are provided for convenience only, and they are not representations that the Swiss franc could be converted into U.S. dollars at the rate indicated. The twelve o’clock buying rate in the City of New York for cable transfers as certified for customs purposes by the Federal Reserve Bank of New York for Swiss francs on December 30, 2022, was \$1.00 = CHF 0.9241. The twelve o’clock buying rate for Swiss francs on February 17, 2023, was \$1.00 = CHF 0.9266.

Cautionary Note Regarding Forward-Looking Statements

This Annual Report includes forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995. We intend such forward-looking statements to be covered by the safe harbor provisions for forward-looking statements contained in Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended (Exchange Act). These forward-looking statements can be identified by the use of forward-looking terminology, including the terms “believes,” “estimates,” “anticipates,” “expects,” “intends,” “may,” “will,” or “should” or, in each case, their negative, or other variations or comparable terminology. These forward-looking statements include all matters that are not historical facts. They appear in a number of places throughout this Annual Report and include statements regarding our intentions, beliefs or current expectations concerning, among other things, our results of operations, financial condition, liquidity, prospects, growth, dispositions, strategies and the countries and industries in which we operate.

These forward looking statements include, but are not limited to, statements about our financial condition and performance, operating results, liquidity and our ability to fund our business operations and initiatives, the impact of the COVID-19 pandemic on our business, capital expenditure and debt service obligations, plans regarding our capital structure, ability to take advantage of market opportunities and drive growth, our products and service offerings and their anticipated performance and impact across various industries and consumer segments, anticipated benefits to the shareholders, planned divestments, acquisitions and integration, and related synergies and other benefits, investment and risk management strategies, volatility in the credit markets, oil prices, foreign currency exchange rates and other market conditions, trends and opportunities, industry trends and expectations, changing consumer behavior and demands, our ability to respond to changing business and economic conditions, our comparative advantages, our commitments and contingencies, availability of raw materials, and other plans, goals, strategies, priorities and initiatives related to our business, including our brand management initiative, the implementation of ABB Way, and cost-saving measures, as well as, the following:

- statements in “Item 3. Key Information—Risk Factors”,
- statements in “Item 5. Operating and Financial Review and Prospects” regarding our management objectives, including our outlook, as well as trends in results, prices, volumes, operations, margins and overall market trends,
- statements in “Item 8. Financial Information—Legal Proceedings” regarding the outcome of certain legal and compliance matters, and
- statements in “Item 8. Financial Information—Dividends and Dividend Policy” regarding our policy on future dividend payments.

By their nature, forward-looking statements involve risks and uncertainties because they relate to events and depend on circumstances that may or may not occur in the future. We caution you that forward-looking statements are not guarantees of future performance and that our actual results of operations, financial condition and liquidity, and the development of the countries and industries in which we operate, may differ materially from those described in or suggested by the forward-looking statements contained in this Annual Report. In addition, even if our results of operations, financial condition and liquidity, and the development of the countries and industries in which we operate, are consistent with the forward-looking statements contained in this Annual Report, those results or developments may not be indicative of results or developments in subsequent periods. Important factors that could cause actual results to differ materially from our expectations are contained in cautionary statements in this Annual Report and include, without limitation, the following:

Business, economic and industry risks

- Our business is exposed to risks associated with the volatile global economic environment and political conditions.
- Our business is exposed to risks associated with the COVID-19 pandemic.
- Our operations in emerging markets expose us to risks associated with conditions in those markets.
- We may encounter difficulty in managing our business due to the global nature of our operations.
- We operate in very competitive and rapidly changing markets and could be adversely affected if we fail to keep pace with technological changes.
- Industry consolidation could result in more powerful competitors and fewer customers.

- Increases in costs or limitation of supplies of raw materials may adversely affect our financial performance.
- Our multi-national operations expose us to the risk of fluctuations in currency exchange rates.
- The uncertainties relating to the United Kingdom's new relationship with the European Union and its potential impact on the relationship between Switzerland and the European Union, may have a negative effect on cross-border trade and our business.

Operational risks

- Increased information technology (IT) security threats and more sophisticated cyber-attacks could pose a risk to our systems, networks, products, solutions and services.
- Our business strategy includes making strategic divestitures. There can be no assurance that any divestitures will provide business benefit.
- Anticipated benefits of historical, existing and potential future mergers, acquisitions, joint ventures or strategic alliances may not be realized.
- There is no guarantee that our ongoing efforts to reduce costs will be successful.
- Illegal behavior by any of our employees or agents could have a material adverse impact on our consolidated operating results, cash flows, and financial position as well as on our reputation and our ability to do business.
- We may be the subject of product liability claims.
- Undertaking long-term, technically complex projects or projects that are dependent upon factors not wholly within our control could adversely affect our profitability and future prospects.
- If we are unable to obtain performance and other guarantees from financial institutions, we may be prevented from bidding on, or obtaining, some contracts, or our costs with respect to such contracts could be higher.
- Our hedging activities may not protect us against the consequences of significant fluctuations in exchange rates, interest rates, inflation or commodity prices on our earnings and cash flows.
- Failure to meet ESG expectations or standards or achieve our ESG goals could adversely affect our business, results of operations, and financial condition.

Legal and regulatory risks

- An inability to protect our intellectual property rights or actual or alleged infringement of a third party's intellectual property rights could adversely affect our business.
- Failure to comply with evolving data privacy and data protection laws and regulations or to otherwise protect personal data, may adversely impact our business and financial results.
- Examinations by tax authorities and changes in tax regulations could result in lower earnings and cash flows.
- We are subject to environmental laws and regulations in the countries in which we operate. We incur costs to comply with such regulations, and our ongoing operations may expose us to environmental liabilities.
- We could be affected by future laws or regulations enacted to address climate change concerns as well as the physical effects of climate change.

General risk factors

- If we are unable to attract and retain qualified management and personnel then our business may be adversely affected.
- Our business subjects us to considerable potential exposure to litigation and legal claims and could be materially adversely affected if we incur legal liability.

We urge you to read the other important factors set forth under sections of this Annual Report entitled “Item 3. Key Information—Risk Factors,” “Item 4. Information on the Company” and “Item 5. Operating and Financial Review and Prospects” for a more complete discussion of the important factors that could affect our future performance and the countries and industries in which we operate. In light of these risks, uncertainties and assumptions, the forward-looking circumstances described in this Annual Report and the assumptions underlying them may not occur.

Except as required by law or applicable stock exchange rules or regulations, we undertake no obligation to update or revise publicly any forward-looking statement, whether as a result of new information, future events or otherwise. All subsequent written and oral forward-looking statements attributable to us or to persons acting on our behalf are expressly qualified in their entirety by the cautionary statements referred to above and contained elsewhere in this Annual Report.

PART I

Item 1. Identity of Directors, Senior Management and Advisers

Not applicable

Item 2. Offer Statistics and Expected Timetable

Not applicable

Item 3. Key Information

Risk factors

You should carefully consider all of the information set forth in this Annual Report and the following description of risks and uncertainties that exist or that we currently believe may exist. Our business, financial condition or results of operations could be adversely affected by any of these risks. Additional risks of which we are unaware or that we currently deem immaterial may also impair our business operations. This Annual Report also contains forward-looking statements that involve risks and uncertainties. Our results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including those described below and elsewhere in this Annual Report. See “Cautionary Note Regarding Forward-Looking Statements”.

Business, economic and industry risks

Our business is exposed to risks associated with the volatile global economic environment and political conditions.

Adverse changes in economic or political conditions, particularly in locations where our customers or operations are located, as well as concerns about global trade and global supply chain, global health crises,

developments in energy prices, inflation, labor market challenges and terrorist activities, could have a material adverse effect on our business, financial condition, results of operations and liquidity and may adversely impact the demand for our products and services. These and other factors may prevent our customers and suppliers from obtaining the financing required to pursue their business activities as planned. Financial and other reasons may force them to modify, delay or cancel orders or plans to purchase or supply our products or services. In addition, if our customers do not generate sufficient revenue, or fail to timely obtain access to the capital markets, they may not be able to pay, or may delay payment of, the amounts they owe us. Customers with liquidity issues have delayed payments of amounts they owe us and this has led and may lead to additional bad debt expense for us, which may adversely affect our results of operations and cash flows. We are also subject to the risk that the counterparties to our credit agreements and hedging transactions may go bankrupt if they suffer catastrophic demand on their liquidity that prevents them from fulfilling their contractual obligations to us.

Our business environment is influenced also by numerous other economic or political uncertainties which may affect the global economy and the international capital markets. In periods of slow economic growth or decline, our customers are more likely to buy less of our products and services, and as a result we are more likely to experience decreased revenues. Our businesses are affected by the level of investments and demand in the markets that we serve, principally utilities, industry and transport & infrastructure. At various times during the last several years, we also have experienced, and may experience in the future, gross margin declines in certain businesses, reflecting the effect of factors such as competitive pricing pressures, inventory write-downs, charges associated with the cancellation of planned expansion and increases in component and manufacturing costs resulting from higher labor and material costs borne by our manufacturers and suppliers that, as a result of competitive pricing pressures or other factors, we are unable to pass on to our customers. Economic downturns also may lead to restructuring actions and associated expenses. Uncertainty about future economic conditions makes it difficult for us to forecast operating results and to make decisions about future investments.

In addition, we are subject to the risks that our business operations in or with certain countries may be adversely affected by trade tariffs, trade or economic sanctions or other restrictions imposed on these countries, including sanctions against Russia relating to the war in Ukraine, contributing to our decision to exit the Russian market, and the trade tensions in recent years with China. These could lead to increased costs for us or for our customers or limit our ability to do business in or with certain countries. In addition, actual or potential investors that object to certain of these business operations may adversely affect the price of our shares by disposing or deciding not to purchase our shares. These countries may from time to time include countries that are identified by the United States as state sponsors of terrorism. If any countries where or with whom we do business are subject to such sanctions or restrictions, our business, consolidated operating results, financial condition and the trading price of our shares may be adversely affected. In 2022, our total revenues from business with countries identified by the U.S. government as state sponsors of terrorism represented significantly less than 1 percent of our total revenues. Based on the amount of revenues and other relevant quantitative and qualitative factors, we have determined that our business in 2022 with countries identified by the U.S. government as state sponsors of terrorism was not material.

Our business is exposed to risks associated with the COVID-19 pandemic.

The novel coronavirus (COVID-19) pandemic has had, and continues to have, significant impacts on the global economy including on demand for products, operational predictability, the movement of people and products across borders, supply chains (including the supply of semiconductors) and the cost of capital. Given the global nature of our business, COVID-19 has had an adverse impact on our revenues and operating margins in all of our businesses and is expected to continue to have an impact at least in the short term. Our Robotics business in China has been particularly impacted. The ultimate extent to which the pandemic impacts our business, liquidity, results of operations and financial condition will depend on future developments, which are highly uncertain and cannot be predicted with confidence, including future mutations of the COVID-19 virus and any resulting impact on the effectiveness of vaccines, the duration and extent of the pandemic and waves of infection, any new travel restrictions and social distancing orders imposed, as well as future business closures and business disruptions that may be caused by actions taken to contain, treat and prevent the disease. If we or our customers experience prolonged shutdowns or other business disruptions, our business, liquidity, results of operations and financial condition may be materially

adversely affected and our ability to access the capital markets may be limited.

Our operations in emerging markets expose us to risks associated with conditions in those markets.

A significant amount of our operations is conducted in the emerging markets in South America, Asia, and the Middle East and Africa. In 2022, approximately 40 percent of our consolidated revenues were generated from these emerging markets. Operations in emerging markets can present risks that are not encountered in countries with well-established economic and political systems, including:

- economic instability, which could make it difficult for us to anticipate future business conditions in these markets, cause delays in the placement of orders for projects that we have been awarded and subject us to volatile geographic markets,
- political or social instability, which could make our customers less willing to make cross-border investments in such regions and could complicate our dealings with governments regarding permits or other regulatory matters, local businesses and workforces,
- boycotts and embargoes that may be imposed by the international community on countries in which we do business or where we seek to do business could adversely affect the ability of our operations in those countries to obtain the materials necessary to fulfill contracts and our ability to pursue business or establish operations in those countries,
- foreign state takeovers of our and our customers' facilities,
- significant fluctuations in interest rates and currency exchange rates,
- the imposition of unexpected taxes or other payments on our revenues in these markets,
- our inability to obtain financing and/or insurance coverage from export credit agencies, and
- exchange controls and other restrictions by foreign governments.

Additionally, political and social instability resulting from increased violence in certain countries in which we do business has raised concerns about the safety of our personnel. These concerns may hinder our ability to send personnel abroad and to hire and retain local personnel. Such concerns may require us to increase security for personnel traveling to and working in affected countries or to restrict or wind-down operations in such countries, which may negatively impact us and result in higher costs and inefficiencies.

Consequently, our exposure to the conditions in or affecting emerging markets may adversely affect our business, financial condition, results of operations and liquidity.

We may encounter difficulty in managing our business due to the global nature of our operations.

We operate in approximately 100 countries around the world and, as of December 31, 2022, employed about 105,000 people, of which approximately 47 percent were located in the Europe region, approximately 28 percent in the Asia, Middle East and Africa region and approximately 25 percent in the Americas region. To manage our day-to-day operations, we must deal with cultural and language barriers and assimilate different business practices. Due to our global nature, we deal with a range of legal and regulatory systems some of which are less developed and less well-enforced than others. The laws and regulations to which we are subject can change rapidly and in unexpected directions. Currency and other local regulatory limitations related to the transfer of funds exist in a number of countries where we operate, including: China, India, South Africa and Turkey. All of this may impact our ability to protect our contractual, intellectual property and other legal rights. In addition, we are required to create compensation programs, employment policies and other administrative programs that comply with the laws of multiple countries. We also must communicate, monitor and uphold group-wide standards and directives across our global network, including in relation to our suppliers, subcontractors and other relevant stakeholders. Our failure to manage successfully our geographically diverse operations could impair our ability to react quickly to changing business and market conditions and to enforce compliance with group-wide standards and procedures.

We operate in very competitive and rapidly changing markets and could be adversely affected if we fail to keep pace with technological changes.

We operate in very competitive and rapidly changing markets where we regularly need to innovate and develop products, systems, services and solutions that address the business challenges and needs of our customers. The nature of these challenges varies across the geographic markets and product areas that we serve. The markets for our products and services are characterized by changing regulatory requirements, developing ESG expectations and evolving industry standards, which may require us to modify our products and systems. The continual development of advanced technologies for new products and product enhancements is an important way in which we remain competitive and maintain acceptable pricing levels. If we fail to keep pace with technological changes in the industrial sectors that we serve, we may experience lower revenues, price erosion and lower margins.

Our primary competitors are sophisticated companies with significant resources that may develop products and services that are superior to our products and services or may adapt more quickly than we do to new technologies, industry changes or evolving customer requirements. We are also facing increased competition from low cost competitors in emerging markets, which may give rise to increased pressure to reduce our prices. Our failure to anticipate or respond quickly to technological developments or customer requirements could adversely affect our business, results of operations, financial condition and liquidity.

Industry consolidation could result in more powerful competitors and fewer customers.

Competitors in the industries in which we operate are consolidating. In particular, the automation industry is undergoing consolidation that is reducing the number but increasing the size of companies that compete with us. As our competitors consolidate, they likely will increase their market share, gain economies of scale that enhance their ability to compete with us and/or acquire additional products and technologies that could displace our product offerings.

Our customer base also is undergoing consolidation. Consolidation within our customers' industries (such as the marine and cruise industry, automotive, aluminum, steel, pulp and paper and pharmaceutical industries and the oil and gas industry) could affect our customers and their relationships with us. If one of our competitors' customers acquires any of our customers, we may lose that business. Additionally, as our customers become larger and more concentrated, they could exert pricing pressure on all suppliers, including us. If we were to lose market share or customers or face pricing pressure due to consolidation of our customers, our results of operations and financial condition could be adversely affected.

Increases in costs or limitation of supplies of raw materials may adversely affect our financial performance.

We purchase large amounts of commodity-based raw materials, including steel, copper, aluminum and oil. Prevailing prices for such commodities are subject to fluctuations due to changes in supply and demand and a variety of additional factors beyond our control, such as global political and economic conditions. Historically, prices for some of these raw materials have been volatile and unpredictable, and such volatility is expected to continue. Therefore, commodity price changes may result in unexpected increases in raw material costs, and we may be unable to increase our prices to offset these increased costs without suffering reduced volumes, revenues or operating income. We do not fully hedge against changes in commodity prices and our hedging procedures may not work as planned.

We depend on third parties to supply raw materials and other components and may not be able to obtain sufficient quantities of these materials and components, which could limit our ability to manufacture products on a timely basis and could harm our profitability. For some raw materials and components, we rely on a single supplier or a small number of suppliers. If one of these suppliers were unable to provide us with a raw material or component we need, our ability to manufacture some of our products could be adversely affected if we are unable to find a sufficient alternative supply channel in a reasonable period of time, on commercially reasonable terms, or at all.

In 2022, global supply chain constraints caused us to experience some delays in supplier deliveries and product shortages for various categories such as semiconductors and certain other raw materials as well as constraints in the transportation of inbound supplies. Although we were able to mitigate some disruptions, we have experienced some delays in delivering to certain of our customers and cannot assure you that our mitigation efforts will be sufficient to overcome these supply chain constraints if they continue or worsen in 2023.

If our suppliers are unable to deliver sufficient quantities of materials on a timely basis, the manufacture and sale of our products may be disrupted, we may be required to assume liability under our agreements with customers and our sales and profitability could be materially adversely affected.

Our multi-national operations expose us to the risk of fluctuations in currency exchange rates.

Currency exchange rate fluctuations have had, and could continue to have, a material impact on our operating results, the comparability of our results between periods, the value of assets or liabilities as recorded on our Consolidated Balance Sheet and the price of our securities. Volatility in exchange rates makes it harder to predict exchange rates and perform accurate financial planning. Changes in exchange rates can unpredictably and adversely affect our consolidated operating results and could result in exchange losses.

Currency Translation Risk. The results of operations and financial position of most of our non-U.S. companies are initially recorded in the currency of the country in which each such company resides, which we call “local currency”. That financial information is then translated into U.S. dollars at the applicable exchange rates for inclusion in our Consolidated Financial Statements. The exchange rates between local currencies and the U.S. dollar can fluctuate substantially, which could have a significant translation effect on our reported consolidated results of operations and financial position.

Increases and decreases in the value of the U.S. dollar versus local currencies will affect the reported value of our local currency assets, liabilities, revenues and expenses in our Consolidated Financial Statements, even if the value of these items has not changed in local currency terms. These translations could significantly and adversely affect our results of operations and financial position from period to period.

Currency Transaction Risk. Currency risk exposure also affects our operations when our sales are denominated in currencies that are different from those in which our manufacturing or sourcing costs are incurred. In this case, if, after the parties agree on a price, the value of the currency in which the price is to be paid were to weaken relative to the currency in which we incur manufacturing or sourcing costs, there would be a negative impact on the profit margin for any such transaction. This transaction risk may exist regardless of whether there is also a currency translation risk as described above.

Currency exchange rate fluctuations in those currencies in which we incur our principal manufacturing expenses or sourcing costs may adversely affect our ability to compete with companies whose costs are incurred in other currencies. If our principal expense currencies appreciate in value against such other currencies, our competitive position may be weakened.

The uncertainties relating to the United Kingdom’s new relationship with the European Union and its potential impact on the relationship between Switzerland and the European Union, may have a negative effect on cross-border trade and our business.

The United Kingdom has withdrawn from the European Union and has negotiated the terms of such departure (the UK-EU Trade and Cooperation Agreement or TCA), which was ratified and entered into full force on May 1, 2021. Because the agreement merely sets forth a framework in many respects and will require complex additional bilateral negotiations between the United Kingdom and the European Union as both parties continue to work on the rules for implementation, significant political and economic uncertainty remains and this has had and may continue to have a material effect on cross-border trade with the United Kingdom and with the European Union. Lack of clarity about future United Kingdom laws and regulations, potentially divergent national laws, the possibility of increased regulatory complexities, or future developments in the European Union could depress economic activity, reduce demand for our products and

services, restrict our access to capital, and diminish or eliminate barrier-free access between the United Kingdom and other European Union member states or among the European economic area overall. Furthermore, the TCA may influence discussions on open trade and political matters between Switzerland and the European Union. Any of these factors could have an adverse effect on our business, financial condition and results of operations.

Operational risks

Increased information technology (IT) security threats and more sophisticated cyber-attacks could pose a risk to our systems, networks, products, solutions and services.

We have observed a global increase in IT security threats and more sophisticated cyber-attacks, which pose a risk to the security of systems and networks and the confidentiality, availability and integrity of data stored and transmitted on those systems and networks. Although we have experienced occasional cybersecurity incidents, none have had a material effect on our business operations. Since we may in the future experience cyber-attacks against our systems, networks, products, solutions and services, we expect that we will continue to incur substantial costs to help mitigate this risk. Similarly, we have observed a continued increase in attacks generally against industrial control systems as well as against our customers and the systems we supply to them, which pose a risk to the security of those systems and networks. Future attacks could potentially lead to the compromising of confidential information, disruption of our business, improper use or downtime of our systems and networks or those we supplied to our customers, manipulation, corruption, inaccessibility and destruction of data, defective products or services, production downtimes and supply shortages. Such attacks may also expose us to loss of business, claims or regulatory action. Any such impact in turn could adversely affect our reputation, competitiveness and results of operations. Our insurance coverage may not be adequate to cover all the costs related to cyber security attacks or disruptions resulting from such events. Due to the nature of these security threats, the nature and scope of the impact of any future incident cannot be predicted.

Our business strategy includes making strategic divestitures. There can be no assurance that any divestitures will provide business benefit.

Our strategy includes divesting certain businesses. The divestiture of an existing business could reduce our future profits and operating cash flows and make our financial results more volatile. We may also retain certain obligations or grant indemnities in connection with a divestment. We may not find suitable purchasers for our non-core businesses and may continue to pay operating costs associated with these businesses. Failed attempts to divest non-core businesses may distract management's attention from other business activities, erode employee morale and customers' confidence, and harm our business. A divestiture could also cause a decline in the price of our shares and increased reliance on other elements of our core business operations. Whether we realize the anticipated benefits of a divestment, including the divestment of the Power Grids business, of the Turbocharging business and of the Mechanical Power Transmission business, depends on whether we successfully manage the related risks. If we do not successfully manage the risks associated with a divestiture, our business, financial condition, and results of operations could be adversely affected.

Anticipated benefits of historical, existing and potential future mergers, acquisitions, joint ventures or strategic alliances may not be realized.

As part of our overall strategy, we may, from time to time, acquire businesses or interests in businesses, including noncontrolling interests, or form joint ventures or create strategic alliances. Whether we realize the anticipated benefits, including operating synergies and cost savings, from these transactions, depends, in part, upon the integration between the businesses involved, the performance and development of the underlying products, capabilities or technologies, our correct assessment of assumed liabilities and the management of the operations in question. Accordingly, our financial results could be adversely affected by unanticipated performance and liability issues, transaction-related charges, amortization related to intangibles, charges for impairment of long-term assets and partner performance.

There is no guarantee that our ongoing efforts to reduce costs will be successful.

We seek continued cost savings through operational excellence and supply chain management. Lowering our cost base is important for our business and future competitiveness. However, there is no guarantee that we will achieve this goal. If we are unsuccessful and the shortfall is significant, there could be an adverse effect on our business, financial condition, and results of operations.

Illegal behavior by any of our employees or agents could have a material adverse impact on our consolidated operating results, cash flows, and financial position as well as on our reputation and our ability to do business.

Certain of our employees or agents have taken, and may in the future take, actions that violate or are alleged to violate the U.S. Foreign Corrupt Practices Act of 1977 (FCPA), legislation promulgated pursuant to the 1997 Organisation for Economic Co-operation and Development (OECD) Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, applicable antitrust laws, other applicable laws or regulations or our Code of Conduct. For more information regarding investigations of past actions taken by certain of our employees, see “Item 8. Financial Information—Legal Proceedings”. Such actions have resulted, and in the future could result, in governmental investigations, enforcement actions, civil and criminal penalties, including monetary penalties and other sanctions, and civil litigation. It is possible that any governmental investigation or enforcement action arising from such matters could conclude that a violation of applicable law has occurred, and the consequences of any such investigation or enforcement action may have a material adverse impact on our consolidated operating results, cash flows and financial position. In addition, such actions, whether actual or alleged, could damage our reputation and ability to do business.

Further, detecting, investigating and resolving such actions could be expensive and could consume significant time and attention of our senior management. While we are committed to conducting business in a legal and ethical manner, our internal control systems at times have not been, and in the future may not be, completely effective to prevent and detect such improper activities by our employees and agents. We are subject to certain ongoing investigations by governmental agencies.

We may be the subject of product liability claims.

We may be required to pay for losses or injuries purportedly caused by the design, manufacture or operation of our products and systems. Additionally, we may be subject to product liability claims for the improper installation of products and systems designed and manufactured by others.

Product liability claims brought against us may be based in tort or in contract, and typically involve claims seeking compensation for personal injury or property damage. Claims brought by commercial businesses are often made also for financial losses arising from interruption to operations. Depending on the nature and application of many of the products we manufacture, a defect or alleged defect in one of these products could have serious consequences. For example:

- If the products produced by our electricity-related businesses are defective, there is a risk of fire, explosions and power surges, and significant damage to electricity generating, transmission and distribution facilities as well as electrical shock causing injury or death.
- If the products produced by our automation-related businesses are defective, our customers could suffer significant damage to facilities and equipment that rely on these products and systems to properly monitor and control their manufacturing processes. Additionally, people could be exposed to electrical shock and/or other harm causing injury or death.
- If any of our products contain hazardous substances, then there is a risk that such products or substances could cause injury or death.
- If any of our protective products were to fail to function properly, there is a risk that such failure could cause injury or death.

If we were to incur a very large product liability claim, our insurance protection might not be adequate or sufficient to cover such a claim in terms of paying any awards or settlements, and/or paying for our defense costs. Further, some claims may be outside the scope of our insurance coverage. If a litigant were successful against us, a lack or insufficiency of insurance coverage could result in an adverse effect on our business, financial condition, results of operations and liquidity. Additionally, a well-publicized actual or perceived issue relating to us or our products could adversely affect our market reputation, which could result in a decline in demand for our products and reduce the trading price of our shares. Furthermore, if we were required or we otherwise determined to make a product recall, the costs could be significant.

Undertaking long-term, technically complex projects or projects that are dependent upon factors not wholly within our control could adversely affect our profitability and future prospects.

We derive a portion of our revenues from long-term, fixed price and turnkey projects and from other technically complex projects that can take many months, or even years, to complete. Such contracts typically involve substantial risks, including the possibility that we may underbid and consequently have no means of recouping the actual costs incurred, and the assumption of a large portion of the risks associated with completing related projects, including the warranty obligations. Some projects involve technological risks, including in cases where we are required to modify our existing products and systems to satisfy the technical requirements of a project, integrate our products and systems into the existing infrastructure and systems at the installation site, or undertake ancillary activities such as civil works at the installation site. Our revenue, cost and gross profit realized on such contracts can vary, sometimes substantially, from our original projections for numerous reasons, including:

- unanticipated issues with the scope of supply, including modification or integration of supplied products and systems that may require us to incur incremental expenses to remedy such issues,
- the quality and efficacy of our products and services cannot be tested and proven in all situations and environments and may lead to premature failure or unplanned degradation of products,
- changes in the cost of components, materials or labor,
- difficulties in obtaining required governmental permits or approvals,
- delays caused by customers, force majeure or local weather and geological conditions, including the ongoing COVID-19 pandemic and natural disasters,
- shortages of construction equipment,
- changes in law or government policy,
- supply bottlenecks, especially of key components,
- suppliers', subcontractors' or consortium partners' failure to perform or delay in performance,
- diversion of management focus due to responding to unforeseen issues, and
- loss of follow-on work.

These risks are exacerbated if a project is delayed because the circumstances upon which we originally bid and quoted a price may have changed in a manner that increases our costs or other liabilities relating to the project. In addition, we sometimes bear the risk of delays caused by unexpected conditions or events. Our project contracts often subject us to penalties or damages if we cannot complete a project in accordance with the contract schedule. In certain cases, we may be required to pay back to a customer all or a portion of the contract price as well as potential damages (which may significantly exceed the contract price), if we fail to meet contractual obligations.

If we are unable to obtain performance and other guarantees from financial institutions, we may be prevented from bidding on, or obtaining, some contracts, or our costs with respect to such contracts could be higher.

In the normal course of our business and in accordance with industry practice, we provide a number of guarantees including bid bonds, advance payment bonds or guarantees, performance bonds or guarantees and warranty bonds or guarantees, which guarantee our own performance. These guarantees may include guarantees that a project will be completed on time or that a project or particular equipment will achieve other defined performance criteria. If we fail to satisfy any defined criteria, we may be required to make payments in cash or in kind. Performance guarantees frequently are requested in relation to large projects.

Some customers require that performance guarantees be issued by a financial institution. In considering whether to issue a guarantee on our behalf, financial institutions consider our credit ratings. If, in the future, we cannot obtain such a guarantee from a financial institution on commercially reasonable terms or at all, we could be prevented from bidding on, or obtaining, some contracts, or our costs with respect to such contracts could be higher, which would reduce the profitability of the contracts. If we cannot obtain guarantees on commercially reasonable terms or at all from financial institutions in the future, there could be a material impact on our business, financial condition, results of operations or liquidity.

Our hedging activities may not protect us against the consequences of significant fluctuations in exchange rates, interest rates, inflation or commodity prices on our earnings and cash flows.

Our policy is to hedge material currency exposures by entering into offsetting transactions with third-party financial institutions. Given the effective horizons of our risk management activities and the anticipatory nature of the exposures intended to be hedged, there can be no assurance that our currency hedging activities will fully offset the adverse financial impact resulting from unfavorable movements in foreign exchange rates. In addition, the timing of the accounting for recognition of gains and losses related to a hedging instrument may not coincide with the timing of gains and losses related to the underlying economic exposures.

As a resource-intensive operation, we are exposed to a variety of market and asset risks, including the effects of changes in inflation, commodity prices and interest rates. We monitor and manage these exposures as an integral part of our overall risk management program, which recognizes the unpredictability of markets and seeks to reduce the potentially adverse effects on our business. As part of our effort to manage these exposures, we may enter into commodity price and interest rate hedging arrangements. Nevertheless, changes in commodity prices and interest rates cannot always be predicted or hedged.

If we are unable to successfully manage the risk of changes in exchange rates, interest rates, inflation or commodity prices or if our hedging counterparties are unable to perform their obligations under our hedging agreements with them, then changes in these rates and prices could have an adverse effect on our financial condition and results of operations.

Failure to meet ESG expectations or standards or achieve our ESG goals could adversely affect our business, results of operations, and financial condition

There has been an increased focus from regulators and stakeholders on environmental, social and governance (ESG) matters. These include greenhouse gas emissions and climate-related risks; diversity, equity, and inclusion; responsible sourcing; human rights and social responsibility; and corporate governance. We have established certain ESG goals, commitments and targets. Our ability to accomplish them presents numerous operational, regulatory, financial, legal, and other challenges, several of which are outside of our control. Our failure to achieve our ESG goals, commitments and targets or comply with emerging ESG regulations could adversely affect our business, results of operations, and financial condition. Any such failure could harm our reputation, adversely impact our ability to attract and retain customers and talent and expose us to increased scrutiny from the investment community and enforcement authorities.

Legal and regulatory risks

An inability to protect our intellectual property rights or actual or alleged infringement of a third party's intellectual property rights could adversely affect our business.

Our intellectual property rights are fundamental to all of our businesses. We generate, maintain, utilize and enforce a substantial portfolio of trademarks, trade dress, patents and other intellectual property rights globally. Intellectual property protection is subject to applicable laws in various local jurisdictions where interpretations and protections vary or can be unpredictable and costly to enforce. We use our intellectual property rights to protect the goodwill of our products, promote our product recognition, protect our proprietary technology and development activities, enhance our competitiveness and otherwise support our business goals and objectives. However, there can be no assurance that the steps we take to obtain, maintain and protect our intellectual property rights will be adequate. Our intellectual property rights may fail to provide us with significant competitive advantages, particularly in foreign jurisdictions that do not have, or do not enforce, strong intellectual property rights. The weakening of protection of our trademarks, trade dress, patents and other intellectual property rights could adversely affect our business. In addition, there exist risks around actual or alleged infringement of third-party intellectual property rights, which could – even with mitigation processes in place - lead to claims against us that require significant resources to resolve. We also may engage in legal action to protect our own intellectual property rights, and enforcing our rights may require considerable time, money and oversight, and existing laws in the various countries in which we provide services or solutions may offer only limited protection.

Failure to comply with evolving data privacy and data protection laws and regulations or to otherwise protect personal data, may adversely impact our business and financial results.

We are subject to many rapidly evolving privacy and data protection laws and regulations around the world including the General Data Protection Regulation (GDPR) in Europe and the Personal Information Protection Law in China as well as the California Data Privacy Act and the California Privacy Rights Act (effective in January 2023) in the United States. This requires us to operate in a complex environment where there are significant constraints on how we can process personal data across our business. The GDPR, which became effective in May 2018, has established stringent data protection requirements for companies doing business in or handling personal data of individuals in the European Union. The GDPR imposes obligations on data controllers and processors including the requirement to maintain a record of their data processing and to implement policies and procedures as part of their mandated privacy governance framework. Breaches of the GDPR or other applicable data privacy laws could result in substantial fines, which in some cases could be up to four percent of our worldwide revenue. In addition, a breach of the GDPR or other data privacy or data protection laws or regulations could result in regulatory investigations, reputational damage, orders to cease/change our use of data, enforcement notices, as well as potential civil claims including class action type litigation. We have invested, and continue to invest, human and technology resources in our data privacy and data protection compliance efforts. There can be no assurance that any such actions will be sufficient to prevent cybersecurity breaches, disruptions, unauthorized release of sensitive information or corruption of data. Despite such actions, there is a risk that we may be subject to fines and penalties, litigation and reputational harm if we fail to properly process or protect the data or privacy of third parties or comply with the GDPR or other applicable data privacy and data protection regimes.

Examinations by tax authorities and changes in tax regulations could result in lower earnings and cash flows.

We operate in approximately 100 countries and therefore are subject to different tax regulations. Changes in tax laws, including those addressing tax avoidance and profit sharing, could result in a higher tax expense and higher tax payments. Furthermore, this could materially impact our tax-related receivables and liabilities as well as deferred income tax assets and liabilities. In addition, the uncertainty of the tax environment in some regions could limit our ability to enforce our rights. As a globally operating organization, we conduct business in countries subject to complex tax rules, which may be interpreted in different ways. Future interpretations or developments of tax regimes may affect our tax liabilities, returns on investments and

business operations. We are regularly examined by tax authorities in various jurisdictions. An adverse decision by a tax authority could cause a material adverse effect on our business, financial condition and results of operations.

We are subject to environmental laws and regulations in the countries in which we operate. We incur costs to comply with such regulations, and our ongoing operations may expose us to environmental liabilities.

Our operations are subject to U.S., European and other laws and regulations governing the discharge of materials into the environment or otherwise relating to environmental protection. Our manufacturing facilities use and produce paint residues, solvents, metals, oils and related residues. We use petroleum-based insulation in transformers and chloroparaffins as a flame retardant. We have manufactured and sold, and we are using in some of our factories, certain types of transformers and capacitors containing polychlorinated biphenyls (PCBs). These are considered to be hazardous substances in many jurisdictions in which we operate. We may be subject to substantial liabilities for environmental contamination arising from the use of such substances. All of our manufacturing operations are subject to ongoing compliance costs in respect of environmental matters and the associated capital expenditure requirements.

In addition, we may be subject to significant fines and penalties if we do not comply with environmental laws and regulations, including those referred to above. Some environmental laws provide for joint and several or strict liability for remediation of releases of hazardous substances, which could result in us incurring a liability for environmental damage without regard to our negligence or fault. Such laws and regulations could expose us to liability arising out of the conduct of operations or conditions caused by others, or for our acts which were in compliance with all applicable laws at the time the acts were performed. Additionally, we may be subject to claims alleging personal injury or property damage as a result of alleged exposure to hazardous substances. Changes in the environmental laws and regulations, or claims for damages to persons, property, natural resources or the environment, could result in substantial costs and liabilities to us.

We could be affected by future laws or regulations enacted to address climate change concerns as well as the physical effects of climate change.

Existing or pending laws and regulations intended to address climate change concerns could affect us in the future. We have incurred, and may need to incur additional costs to comply with these laws and regulations and any non-compliance could adversely affect our reputation and result in significant fines. We could also be affected indirectly by increased prices for goods or services provided to us by companies that are directly affected by these laws and regulations and pass their increased costs through to their customers. At this time, we cannot estimate what impact such costs may have on our business, results of operations or financial condition. We could also be affected by the physical consequences of climate change itself, although we cannot estimate what impact those consequences might have on our business or operations. Any such changes could also impact our ability to achieve our 2030 Sustainability targets as well as the related costs and resources necessary to do so.

General risk factors

If we are unable to attract and retain qualified management and personnel then our business may be adversely affected.

Our success depends in part on our continued ability to hire, assimilate and retain highly qualified personnel, particularly our senior management team and key employees. Competition for highly qualified management and technical personnel remains intense in the industries and regions in which we operate. If we are unable to attract and retain members of our senior management team and key employees, including in connection with our ongoing organizational transformation, this could have an adverse effect on our business.

Our business subjects us to considerable potential exposure to litigation and legal claims and could

be materially adversely affected if we incur legal liability.

We are subject to, and may become a party to, a variety of litigation or other claims. Our business is subject to the risk of claims involving current and former employees, customers, partners, subcontractors, suppliers, competitors, shareholders, government regulatory agencies or others through private actions, class actions, whistleblower claims, administrative proceedings, regulatory actions or other proceedings. Our acquisition activities have in the past and may in the future be subject to litigation or other claims. While we maintain insurance for certain potential liabilities, such insurance does not cover all types and amounts of potential liabilities and is subject to various exclusions as well as caps on amounts recoverable.

Item 3A. [Reserved]

Item 4. Information on the Company

Introduction

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 130 years of excellence, ABB's approximately 105,000 employees are committed to driving innovations that accelerate industrial transformation.

We operate in over 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 "Item 5. Operating and Financial Review and Prospects—Analysis of results of operations—Revenues" and "Note 23 - Operating segment and geographic data" to our Consolidated Financial Statements. Until June 30, 2020, we also operated the Power Grids business, which is reported as discontinued operations in the Consolidated Financial Statements (see "Discontinued operations" section below). On July 1, 2020, we completed the divestment of 80.1 percent of the Power Grids business to Hitachi Ltd (Hitachi). We retained a 19.9 percent ownership interest through our investment in Hitachi Energy Ltd (Hitachi Energy), which beneficially owns or controls all the subsidiaries of the Power Grids business, until December 2022 when we sold the remaining investment in Hitachi Energy to Hitachi.

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 Web site 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.

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.

As described above, on July 1, 2020, we divested 80.1 percent of our ownership in the Power Grids business to Hitachi, and in December 2022, Hitachi purchased the remaining 19.9 percent of Hitachi Energy.

ABB Ltd shares are currently listed on the SIX Swiss Exchange, the NASDAQ OMX Stockholm Exchange and the New York Stock Exchange (in the form of American Depositary Shares).

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 2022 amounted to approximately 4 percent of revenues. We focus our research and development expenditures on key areas of innovation and have spent approximately \$7.8 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 2022, we completed the implementation of the decentralized way of working at ABB within all our Divisions. Our focus area in 2023 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 mandatory target to make annual productivity improvements of at least 3 percent each year.

The corporate functions focus on necessary strategic, financial and governance activities, with a lean headcount of approximately 900 employees.

Enhanced growth profile

Over the past several years, we have taken significant organic and inorganic actions to align our business portfolio to more attractive growth markets, increasing our focus on discrete industries, as well as transport and infrastructure, that offer better growth opportunities. 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 twice as fast as other energy sources, resulting in approximately 50 percent higher average annual investments into distribution networks over the next 10 years (source: IEA World Energy Outlook 2021, Announced Pledges Scenario). The share of low-carbon sources in the global energy mix is expected to increase to 50 percent by 2050 from only 20 percent today (source: IEA World Energy Outlook 2021, 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. 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 10 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 and increasingly 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 60 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, demand from end-markets such as food and beverage, machine builders and general industry grew strongly in 2022 as did the automotive segment due to broadly accelerating investments in the EV segment. As supply chain constraints eased in the latter part of 2022, we saw a normalization of customers' order patterns following a period of pre-buying due to extended delivery lead times.

Later-cycle process industries improved across nearly all customer segments. We saw an increase in gas-related demand during the second half of the year. Early signs of headwind were noted in energy intensive industries such as metals as a result of higher energy prices.

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 a very strong order development across data centers and the e-mobility business. The buildings segment improved in both the residential and non-residential segments, although softness in residential building in China was noted, as well as general weakness in residential-related demand towards the second half of the year. In the marine segment there were positive developments for the cruise ship sector as well as general marine and ports demand.

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 2022, 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 industry, transport & infrastructure and utilities 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, breakers, power conversion products and charging solutions for electric vehicles, 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 through a global network of channel partners and end customers. Approximately 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, 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 52,300 employees as of December 31, 2022, and generated \$14.1 billion of revenues in 2022.

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, e-mobility, 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

The Electrification Business Area's products and services are delivered through seven operating Divisions.

The Distribution Solutions Division helps utility, industry and transport & infrastructure customers improve power quality and control, reduce outage time and enhance operational reliability and efficiency. The Division offers products, solutions and services that largely serve the power distribution sector, often providing the requisite medium-voltage link between high-voltage transmission systems and low-voltage users. With ABB Ability™ enabled digital solutions at its core, the offering includes low-voltage switchgear (up to 1 kilovolt) and medium-voltage equipment (1 to 66 kilovolts), indoor and outdoor circuit breakers, reclosers, fuses, contactors, relays, instrument transformers, sensors, motor control centers, as well as a wide range of air- and gas-insulated switchgear. The Division also produces indoor and outdoor modular systems and other segment-specific solutions to facilitate efficient and reliable distribution, protection and control of power, adding value through design, engineering and project management.

The Smart Power Division helps protect, control, and connect people, plants, and systems with a portfolio of low-voltage products and systems. The product offering includes, molded-case and air-circuit breakers, safety products including sensors, switches, contactors, relays, and power protection solutions such as uninterruptible power supply (UPS) solutions, status transfer switches and power distribution units.

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 for 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. 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 our customers 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 utility and industrial applications under its marquee brands including Elastimold™ reclosers and switchgear, capacitor switches, current limiting fuses, the High 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 Power Conversion Division designs, develops and manufactures end-to-end solutions to power and safeguard life's everyday moments. The Division supports customers in rapidly changing, disruptive industries where power reliability, efficiency, and quality matter most, and customers rely on the Division to solve their most difficult power challenges. Customers include businesses in telecom/5G, networking, data centers, and industrial applications such as EV charging, robotics, laser, test & measurement, and utilities. The Division is powering the technology behind today's connected world, helping to enable industrial advancement with the realization of 5G and to advance data center power architectures as the cloud becomes more business-critical than ever before.

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.

The Service Division partners with our customers to address their energy challenges for today and tomorrow. Our team of world-class engineers collaborate globally across ABB's Electrification portfolio to service customers in utilities, transportation, infrastructure and industry, assisting to maintain uninterrupted power supply, maximizing energy efficiency while lowering cost and carbon emissions. We bring greater reliability, predictability and sustainability to their operations, and through our digital service portfolio, we drive new levels of optimization, responsiveness and connectivity.

Sales and Marketing

Sales and marketing is generally conducted within the Divisions in Electrification. 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 Chint, Eaton, Hubbell, Legrand, LS Electric, Panasonic, Schneider Electric, Siemens and Vertiv.

Capital Expenditures

The Electrification Business Area's capital expenditures for property, plant and equipment totaled \$385 million in 2022, compared to \$345 million in 2021. Investments in 2022 were higher than in 2021 driven by capacity expansion for e-mobility products and some investments which were previously delayed in 2021 and 2020 due to the COVID-19 pandemic. Investments in 2022 principally related to real estate investments, capacity expansion, as well as equipment replacement and upgrades. Geographically, in 2022, Europe represented 55 percent of the capital expenditures, followed by the Americas (33 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 21,100 employees as of December 31, 2022, and generated \$6.7 billion of revenues in 2022.

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

At December 31, 2022, the Motion Business Area's products and services are delivered through seven operating Divisions. The Business Area divested its Mechanical Power Transmission Division on November 1, 2021, which designed, manufactured and sold various mechanical power transmission products sold under the Dodge® brand.

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 supplies high-power, high-performance drives, drive systems and packages for industrial process and large infrastructure 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 and aims to help customers by maximizing uptime, extending 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 to help customers prevent expensive downtime while also optimizing operations profitably, safely and reliably.

The Traction Division is a recognized leader in traction technologies that drive innovation in rail, bus and other modes of electric transportation. A comprehensive range of high performance propulsion, auxiliary and energy storage solutions help improve energy efficiency and contributes to making transportation more sustainable.

The IEC Low Voltage Motors Division is a global market leader that provides a full range of energy efficient low voltage motors, including ultra-efficient motors such as synchronous reluctance motors (SynRM) to help customers reduce power bills and cut emissions. Through a global footprint, application expertise and with rugged designs, the Division's products support customers with IEC low-voltage motor solutions that improve reliability and productivity 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 robust, reliable and highly efficient offerings power critical infrastructure and transportation across all major industries and applications often in remote and demanding locations.

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, Siemens, Toshiba, WEG Industries, SEW EURODRIVE and Danfoss.

Capital Expenditures

Capital expenditures in the Motion Business Area for property, plant and equipment totaled \$150 million in 2022, compared to \$230 million in 2021, which included the purchase of a formerly leased property in China. Principal expenditures in 2022 related to real estate investments, capacity expansion, equipment replacement and upgrades across various countries including Finland, the United States, China and India. Geographically, in 2022, Europe represented 60 percent of the capital expenditures, followed by the Americas (28 percent) and Asia, Middle East and Africa (12 percent).

Process Automation Business Area

Overview

The Process Automation Business Area offers customers in process, hybrid and maritime industries a broad range of integrated automation, electrical, motion and digital systems, solutions and related services that are designed to optimize productivity, energy efficiency, sustainability and safety of industrial processes and operations, based on the Business Area's deep domain knowledge and expertise of each end market.

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 installed own products. In some cases, the Business Area integrates offerings from the Electrification, Motion and Robotics & Discrete Automation Business Areas into its integrated systems. 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 20,100 employees as of December 31, 2022, and generated revenues of \$6.0 billion in 2022.

Customers

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

Products and Services

The offering of the Process Automation Business Area includes an extensive portfolio of products, solutions, digital applications and services for the control of the simplest to the most complex and critical of processes and infrastructure. These systems can link various process and information flows, allowing customers to manage and control their entire business process based on real-time information. The Business Area's control platform includes ABB Ability™ Distributed Control System (DCS), 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 the open automation platform needs of the Hydropower and Water industry segments) and our 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 products in each Division.

As of December 31, 2022, the Process Automation Business Area's products and services are delivered through four operating Divisions. The Business Area spun off its Turbocharging Division in October 2022, which manufactured and serviced turbochargers for diesel and gas engines for marine- and land-based power generation.

The Energy Industries Division enables safe, smart, and sustainable projects and operations for businesses across the oil and gas, chemicals, life sciences, power generation and water sectors. It is committed to driving more sustainable use of our planet's resources through innovative solutions that enable energy efficient and low carbon operations across traditional industries and support the development of new and renewable energy models. The Division serves the energy market with leading integrated solutions that automate, digitalize and electrify operations across industries. 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 all customers, from project start-up and throughout the entire plant lifecycle.

The Process Industries Division serves the mining, minerals processing, metals, aluminum, 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, erects 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 industry through its extensive portfolio of integrated marine systems and solutions that improve the flexibility, reliability and energy efficiency of vessels. By coupling power, propulsion, automation, marine software and services that ensure maximum vessel uptime, we are well positioned to help improve the profitability and sustainability of our customers' business throughout the entire lifecycle of a fleet. 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 portfolio of the Measurement & Analytics Division consists of analyzers (measuring compositions of gases and liquids), instrumentation (measuring the typical process variables of temperature, pressure, flow, and level) as well as specialized measurements for specific industries. With this offering the Division serves virtually all process, hybrid and marine industries, the largest among them being the oil, gas and chemical value chain, water and power generation industries. The Division also provides advanced digital solutions to help customers improve productivity, safety and environmental sustainability.

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 \$100 million in 2022, compared to \$85 million in 2021. Principal investments in 2022 primarily related to purchases of land and building, mainly in the Energy Industries Division. Geographically, in 2022, Europe represented 76 percent of the capital expenditures, followed by Asia, Middle East and Africa (13 percent) and the Americas (11 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 10,700 employees as of December 31, 2022, and generated \$3.2 billion of revenues in 2022.

Customers

Robotics & Discrete Automation 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 \$86 million in 2022, compared to \$96 million in 2021. Principal investments in 2022 were primarily related to a new Robotics factory in Shanghai, China, and selective investments mainly in production facilities in the Robotics Division in Sweden and in the Machine Automation Division in Austria. In 2022, Europe represented 66 percent of capital expenditures, followed by Asia, Middle East and Africa (28 percent) and the Americas (6 percent).

Corporate and Other

Corporate and Other includes core headquarter functions, real estate activities, Corporate Treasury Operations, Global Business Services (GBS), the investment in Hitachi Energy (until December 2022) 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. In addition, the historical business activities of certain divested businesses are 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.

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, financial planning and analysis, internal audit, legal and integrity, compliance, risk management and insurance, corporate communications, information systems and investor relations.

GBS operates shared service centers globally through a network of four hubs and consists of both expert and transactional services in the areas of human resources, finance and information services. GBS also staffs and maintains front offices in most countries. The costs in GBS 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. GBS also provides services to third parties under transitional service agreements in relation to certain divested businesses, the largest of which are Hitachi Energy (the former Power Grids business) and Accelleron (the former Turbocharging Division).

A significant portion of the costs for GBS and other shared corporate overhead costs are charged to the operating businesses. Up to the divestment of the Power Grids business on July 1, 2020, overhead and other management costs, including GBS costs, which would have been allocated or charged to our Power Grids business, and which were not directly attributable to this business, have not been allocated to the discontinued operation and are included in Corporate and Other as "stranded costs".

Corporate and Other had approximately 1,000 employees at December 31, 2022, of which approximately 100 pertain to our non-core businesses.

Discontinued operations

In July 2020, we divested 80.1 percent of our Power Grids business to Hitachi Ltd. As a result, the Power Grids business is reported as discontinued operations in the Consolidated Financial Statements for all years presented. See “Note 3 - Discontinued operations” to our Consolidated Financial Statements.

Power Grids business

The former Power Grids business of ABB delivered products, systems, software and service solutions across the power value chain for utility, industry and transport & infrastructure customers.

The Power Grids business operated worldwide with a globally diversified manufacturing, engineering, and research and development footprint. Direct sales accounted for the majority of total revenues generated by the business while external channel partners such as EPCs, wholesalers, distributors and OEMs accounted for the rest.

Products and Services

The Grid Automation operation supplied substation automation products, systems and services. It also provided Supervisory Control and Data Acquisition (SCADA) systems for transmission and distribution networks as well as a range of wireless, fiber optic and powerline carrier-based telecommunication technologies for mission-critical applications and also offered grid-edge and microgrid solutions. Its enterprise software portfolio provided solutions for managing and optimizing assets, operations, logistics, financials and HR, reducing operating costs and improving productivity for customers.

The Grid Integration operation was a leading provider of integration and transmission solutions such as High Voltage Direct Current (HVDC). Another key part of the portfolio was the Flexible Alternating Current Transmission Systems (FACTS) business, which comprised Static Var Compensation (SVC) and static compensator (STATCOM) technologies to address stability and power quality issues. The Grid Integration operation's portfolio also included a range of high-power semiconductors, a core technology for power electronics deployed in HVDC, FACTS and rail applications. The Grid Integration operation also provided transmission and distribution substations and associated lifecycle services. These substations are used in utility and non-utility applications including rail, data centers and various industries. Battery energy storage solutions and shore-to-ship power supply were also part of the customer offering.

The High Voltage products operation was a provider of high voltage switchgear up to 1200 kV AC and 1100 kV DC with a portfolio spanning air-insulated, gas-insulated and hybrid technologies. It also manufactured generator circuit breakers, a key product for integrating large power plants into the grid. The portfolio also included a broad range of capacitors and filters that facilitate power quality, instrument transformers and other substation components.

The Transformers operation supplied transformers that are an integral component found across the power value chain, enabling the reliable, efficient and safe conversion of voltage levels. The product range included dry- and liquid-distribution transformers, traction transformers for rail applications and special application transformers plus related components, for example, insulation kits, bushings and other transformer accessories.

The Power Grids business also had an extensive portfolio of service offerings across the value chain. The portfolio included spare parts, condition monitoring and maintenance services, on- and off-site repairs as well as retrofits and upgrades. Advanced software-based monitoring and advisory services further enhanced the portfolio.

Capital expenditures

Total capital expenditures for property, plant and equipment and intangible assets (excluding intangibles acquired through business combinations) amounted to \$762 million, \$820 million and \$694 million in 2022, 2021 and 2020, respectively. In 2022 and 2021, capital expenditures were 6 percent and 8 percent lower, respectively, than depreciation and amortization. Excluding acquisition-related amortization, capital expenditures were 30 percent higher in 2022 and 28 percent higher in 2021, respectively, than depreciation and amortization.

Capital expenditures in 2022 primarily focused in mature markets, reflecting the geographic distribution of our existing production facilities. Capital expenditures in Europe and North America in 2022 were driven primarily by upgrades and maintenance of existing production facilities, mainly in the U.S., Germany, Italy, Finland, Netherlands, and Switzerland. 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 2022 and 2021 was 24 percent and 33 percent, respectively.

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, while at December 31, 2021, construction in progress for property, plant and equipment was \$522 million, mainly in the U.S., Switzerland, Germany, Sweden, Italy, China and India.

Our capital expenditures relate primarily to property, plant and equipment and are funded primarily through cash flows from operating activities. For 2023, 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, aluminum, steel, 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 steel, copper, 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, silver and aluminum 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).

Overall, during 2022, supply chain management personnel in our businesses, and in the countries in which we operate, along with the category teams, continued to focus on value chain optimization efforts in all areas, while maintaining and improving quality and delivery performance. Responding to the challenges of overall global supply chain constraints, each Business Area quickly implemented a task force to mitigate supply chain shortages. The Business Areas experienced some delays in supplier deliveries and product shortages for various categories such as semiconductors and other raw materials as well as constraints in the transportation of inbound supplies. However, we responded to these challenges and took mitigating actions such as building up buffer stocks, approving new suppliers, changing supplier splits, combined with daily, weekly and monthly task force project follow ups. We have, to a large extent, been able to mitigate most disruptions, maintain a competitive service level and support our business growth, while maintaining delivery schedules to our customers.

Through our Sustainable Supply Base Management (SSBM) approach, we assess 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.

We manage our obligations in relation to conflict minerals through our Conflict Minerals policy and processes that we aim to continually improve and tailor to our value chain. We continue to work with our suppliers and customers to enable us to comply with the SEC's rules and disclosure obligations relating to conflict minerals. Further information on ABB's Conflict Minerals policy and supplier requirements can be found under "Material Compliance" at global.abb/group/en/about/supplying/material-compliance.

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, 2022, we have a portfolio of approximately 25,000 pending patent applications and granted patents, of which approximately 5,500 are pending applications. This portfolio includes approximately 3,500 utility models and design rights, of which approximately 200 are pending applications. In 2022, we filed close to 500 priority patents, utility model and design applications, each covering a unique invention or unique angle on an invention. Additionally, we filed approximately 1,850 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.

Sustainability activities

Sustainability is key to our purpose which is to enable a more sustainable and resource-efficient future with our technology leadership in electrification and automation. We believe that sustainable development means progress towards a healthier and more prosperous world today and for future generations. This means balancing the needs of society, the environment and the economy. To achieve this, we act and embed this approach to business across our value chain, including our own operations, our suppliers, our customers and the communities we serve. We strive to always be an exemplary corporate citizen wherever we operate.

Our 2030 sustainability strategy consists of four pillars:

Enabling a low-carbon society by helping to reduce carbon emissions through our technologies which target sectors that account for three quarters of global energy consumption. Our ambition is to support our customers in avoiding emissions. As we intend to have our targets validated against the Science Based Targets initiative's new Net-Zero Standard, we are no longer focusing on a limited number of cases linked to the 100 megatons emissions avoidance but rather on our complete portfolio of offerings. Our 2030 commitments for emissions in our own operations and supply chain are:

- achieve carbon neutrality across our own operations and reduce CO₂e (CO₂ equivalent) emissions in own operations by at least 80 percent compared to baseline year 2019, and
- work with our main tier-one suppliers (suppliers covering 70 percent of our annual procurement spend) to achieve a 50 percent reduction in their CO₂e emissions by 2030.

Preserving resources by embedding circularity across our value chain. Our solutions reduce waste, provide increased recyclability and foster reusability. Our 2030 commitments are:

- ensure that at least 80 percent of ABB products and solutions are covered by our circularity approach, and
- send zero waste from our own operations to landfills, wherever this is compatible with local conditions and regulations.

Promoting social progress by taking care of our employees and promoting progress around the world. We create safe, fair and inclusive working environments and support community building. Our 2030 commitments:

- pursue the ambition that no harm is caused to our people and contractors – we aim for a yearly reduction in lost time from incidents,
- double the number of women in senior management roles to 25 percent, within our comprehensive diversity and inclusion framework,
- targeting a top-tier employee engagement score in our industry, and
- provide impactful support for community-building initiatives.

Creating a culture of integrity and transparency along the extended value chain by:

- always adhering to the ABB Code of Conduct, which forms the basis for interactions with projects and counterparties,
- successfully implementing a global framework for assessing and mitigating all third-party risks through risk-based due diligence and life-cycle monitoring,

- successfully implementing a global integrity program underpinned by accountability for integrity and an adaptive risk management strategy gained from insights through targeted learnings, transparent reporting and monitoring,
- incorporating sustainability targets into our senior management incentives, and
- ensuring that at least 80 percent of supply spend in focus countries is covered by our Sustainable Supply Base Management program, which includes environmental, social and governance performance.

Reflecting the importance of sustainability as a strategic topic, ABB's Board of Directors oversees our sustainability strategy, targets and our annual sustainability report. The Governance and Nomination Committee of the Board of Directors is responsible for overseeing "corporate social responsibility" (including health, safety and environment as well as sustainability), while the Compensation Committee ensures that ABB remuneration policies are linked to the achievement of its sustainability targets.

In 2022, we continued our efforts to work towards our 2030 sustainability targets. We see a further improvement in the share of green electricity we use from 51 percent in 2021 (53 percent adjusting for the divestment of the Mechanical Power Transmission division) to 81 percent in 2022. The amount of waste sent to landfill has decreased from 12.6 thousand tons in 2021 (12.3 thousand tons adjusting for the divestment of the Mechanical Power Transmission division) to 11.6 thousand tons in 2022. Globally, operations at 75 percent of our sites and offices are covered by externally certified environmental management systems. A total of 3 environmental incidents were reported in 2022, none of which had a material environmental impact.

In 2022, we recorded zero work-related fatalities and our lost time incident frequency rate slightly increased from 0.142 per 200,000 hours worked in 2021 to 0.143 in 2022. The number of women in senior management positions increased from 16.3 percent in 2021 to 17.8 percent in 2022.

Our employee engagement score increased from 74 (out of 100) in 2021 to 76 in 2022, while the response rate increased from 78 percent to 82 percent. We continued to provide impactful support for community-building initiatives across all regions.

During 2022, we introduced a new procedure for the management of third parties. This was rolled out across ABB to cover all sales channels, suppliers and customers, among others. The enhanced process will strengthen our conduct of risk-based due diligence, our oversight of interactions with third parties and the performance of the third parties themselves. At the end of 2022, 22 percent of high-risk supply spend in focus countries was covered by our Sustainable Supply Base Management program. We believe we are on track for our medium-term target of 80 percent of our high-risk supply spend in focus countries by 2025.

In 2022, all Executive Committee members had at least two sustainability-related goals (e.g., CO₂e emission reduction, safety, female leadership) in their individual component of the Annual Incentive Plan (AIP).

Regulation

Our operations are subject to numerous governmental laws and regulations including those governing antitrust and competition, corruption, the environment, securities transactions and disclosures, import and export of products, currency conversions and repatriation, taxation of foreign earnings and earnings of expatriate personnel and use of local employees and suppliers.

As a reporting company under Section 12 of the Exchange Act, we are subject to the FCPA's anti-bribery provisions with respect to our conduct around the world.

Our operations are also subject to the 1997 OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions. The convention obliges signatories to adopt national legislation that makes it a crime to bribe foreign public officials. Those countries which have adopted implementing legislation and have ratified the convention include the U.S., several European nations and certain other countries in which we have significant operations.

We conduct business in certain countries known to experience governmental corruption. While we are committed to conducting business in a legal and ethical manner, our employees or agents have taken, and in the future may take, actions that violate the U.S. FCPA, legislation promulgated pursuant to the 1997 OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, antitrust laws or other laws or regulations. These actions have resulted and could result in monetary or other penalties against us and could damage our reputation and, therefore, our ability to do business. For more information, see “Item 8. Financial Information—Legal Proceedings”.

The U.S. Iran Threat Reduction and Syria Human Rights Act of 2012 requires U.S. listed companies to disclose information relating to certain transactions with Iran. In 2018, certain non-U.S. subsidiaries of ABB, in accordance with applicable laws, provided electrical equipment, automation systems and on-site services to OEMs, distributors, panel builders, EPC contracting companies and other customers for Iranian business. ABB discontinued its Iranian business on November 4, 2018. As previously disclosed, ABB is completing minor work on a long-term contract which is being performed in line with applicable sanctions. The revenues attributable to this work in 2022 amounted to approximately \$0.2 million.

Organizational structure

ABB Ltd is the ultimate parent company of the ABB Group. It is the sole shareholder of ABB Asea Brown Boveri Ltd which directly or indirectly owns the other companies in the ABB Group. The table below both sets forth, as of December 31, 2022, the name, place of incorporation and ownership interest of the significant direct and indirect subsidiaries of ABB Ltd, Switzerland. ABB’s operational group structure is described above in the “Businesses” section of Item 4.

Name	Location	Country	Group Interest %
ABB Australia Pty Limited	Moorebank	Australia	100.00
ABB Group Holdings Pty. Ltd.	Moorebank	Australia	100.00
ABB Group Investment Management Pty. Ltd.	Moorebank	Australia	100.00
ABB AG	Wiener Neudorf	Austria	100.00
B&R Holding GmbH	Eggelsberg	Austria	100.00
B&R Industrial Automation GmbH	Eggelsberg	Austria	100.00
ABB N.V.	Zaventem	Belgium	100.00
ABB Automacao LTDA	Sorocaba	Brazil	100.00
ABB Eletrificacao LTDA	Sorocaba	Brazil	100.00
ABB Bulgaria EOOD	Sofia	Bulgaria	100.00
ABB Electrification Canada ULC	Edmonton	Canada	100.00
ABB Inc.	Saint-Laurent	Canada	100.00
ABB S.A.	Santiago	Chile	100.00
ABB (China) Investment Limited	Beijing	China	100.00
ABB (China) Ltd.	Beijing	China	100.00
ABB Beijing Drive Systems Co. Ltd.	Beijing	China	90.00

Name	Location	Country	Group Interest %
ABB Beijing Switchgear Limited	Beijing	China	60.00
ABB Electrical Machines Ltd.	Shanghai	China	100.00
ABB Engineering (Shanghai) Ltd.	Shanghai	China	100.00
ABB LV Installation Materials Co. Ltd. Beijing	Beijing	China	85.70
ABB Shanghai Free Trade Zone Industrial Co., Ltd.	Shanghai	China	100.00
ABB Shanghai Motors Co. Ltd.	Shanghai	China	75.00
ABB Xiamen Low Voltage Equipment Co. Ltd.	Xiamen	China	100.00
ABB Xiamen Switchgear Co. Ltd.	Xiamen	China	66.52
ABB Xinhui Low Voltage Switchgear Co. Ltd.	Xinhui	China	90.00
ABB s.r.o.	Prague	Czech Republic	100.00
ABB A/S	Skovlunde	Denmark	100.00
ABB for Electrical Industries (ABB ARAB) S.A.E.	Cairo	Egypt	100.00
Asea Brown Boveri S.A.E.	Cairo	Egypt	100.00
ABB AS	Jüri	Estonia	100.00
ABB Oy	Helsinki	Finland	100.00
ABB France	Cergy Pontoise	France	99.84
ABB SAS	Cergy Pontoise	France	100.00
ABB AG	Mannheim	Germany	100.00
ABB Beteiligungs- und Verwaltungsgesellschaft mbH	Mannheim	Germany	100.00
ABB Stotz-Kontakt GmbH	Heidelberg	Germany	100.00
ABB Striebel & John GmbH	Sasbach	Germany	100.00
B + R Industrie-Elektronik GmbH	Bad Homburg	Germany	100.00
Busch-Jaeger Elektro GmbH	Lüdenscheid	Germany	100.00
ABB Engineering Trading and Service Ltd.	Budapest	Hungary	100.00
ABB Global Business Services and Contracting India Private Limited	Bangalore	India	100.00
ABB Global Industries and Services Private Limited	Bangalore	India	100.00
ABB India Limited	Bangalore	India	75.00
ABB E-mobility S.p.A.	Milan	Italy	91.56
ABB S.p.A.	Milan	Italy	100.00
ABB K.K.	Tokyo	Japan	100.00
ABB Ltd.	Seoul	Korea, Republic of	100.00
ABB Electrical Control Systems S. de R.L. de C.V.	Monterrey	Mexico	100.00
ABB Mexico S.A. de C.V.	San Luis Potosi	Mexico	100.00
Asea Brown Boveri S.A. de C.V.	San Luis Potosi	Mexico	100.00
ABB B.V.	Rotterdam	Netherlands	100.00
ABB E-mobility B.V.	Delft	Netherlands	91.56
ABB Finance B.V.	Rotterdam	Netherlands	100.00
ABB Holdings B.V.	Rotterdam	Netherlands	100.00
ABB AS	Fornebu	Norway	100.00
ABB Electrification Norway AS	Skien	Norway	100.00
ABB Holding AS	Fornebu	Norway	100.00
ABB Business Services Sp. z o.o.	Warsaw	Poland	99.94

Name	Location	Country	Group Interest %
ABB Industrial Solutions (Klodzko) Sp. z o.o.	Klodzko	Poland	99.94
ABB Sp. z o.o.	Warsaw	Poland	99.94
Industrial C&S of P.R. LLC	San Juan	Puerto Rico	100.00
ABB Electrical Industries Co. Ltd.	Riyadh	Saudi Arabia	65.00
ABB Pte. Ltd.	Singapore	Singapore	100.00
ABB Holdings (Pty) Ltd.	Modderfontein	South Africa	100.00
ABB Investments (Pty) Ltd	Modderfontein	South Africa	51.00
ABB South Africa (Pty) Ltd.	Modderfontein	South Africa	74.91
Asea Brown Boveri S.A.	Madrid	Spain	100.00
ABB AB	Västerås	Sweden	100.00
ABB Electrification Sweden AB	Västerås	Sweden	100.00
ABB Norden Holding AB	Västerås	Sweden	100.00
ABB Asea Brown Boveri Ltd	Zurich	Switzerland	100.00
ABB Canada EL Holding GmbH	Zurich	Switzerland	100.00
ABB Capital AG	Zurich	Switzerland	100.00
ABB E-mobility Holding Ltd	Baden	Switzerland	91.56
ABB Information Systems Ltd.	Zurich	Switzerland	100.00
ABB Management Services Ltd.	Zurich	Switzerland	100.00
ABB Schweiz AG	Baden	Switzerland	100.00
ABB Ltd.	Taipei	Taiwan (Chinese Taipei)	100.00
ABB Elektrik Sanayi A.S.	Istanbul	Turkiye	99.99
ABB Industries (L.L.C.)	Dubai	United Arab Emirates	49.00 ⁽¹⁾
ABB Holdings Limited	Warrington	United Kingdom	100.00
ABB Limited	Warrington	United Kingdom	100.00
ABB E-mobility Inc.	Wilmington, DE	United States	91.56
ABB Finance (USA) Inc.	Wilmington, DE	United States	100.00
ABB Holdings Inc.	Cary, NC	United States	100.00
ABB Inc.	Cary, NC	United States	100.00
ABB Installation Products Inc.	Memphis, TN	United States	100.00
ABB Motors and Mechanical Inc.	Fort Smith, AR	United States	100.00
ABB Treasury Center (USA), Inc.	Wilmington, DE	United States	100.00
Edison Holding Corporation	Wilmington, DE	United States	100.00
Industrial Connections & Solutions LLC	Cary, NC	United States	100.00

(1) Company consolidated as ABB exercises full management control.

Description of property

As of December 31, 2022, we occupy real estate in around 100 countries throughout the world. The facilities consist mainly of manufacturing plants, office buildings, research centers and warehouses. A substantial portion of our production and development facilities is situated in China, the U.S., Germany, Finland, Sweden, Italy, Canada, India, Poland and Mexico. We also own or lease other properties, including office buildings, warehouses, research and development facilities and sales offices in many countries. We own substantially all of the machinery and equipment used in our manufacturing operations.

From time to time, we have a surplus of space arising from acquisitions, production efficiencies and/or restructuring of operations. Normally, we seek to sell such surplus space which may involve leasing property to third parties for an interim period. As a result of the divestment of the Power Grids business to Hitachi Ltd in 2020, certain property, plant and equipment previously owned by ABB which related to the Power Grids business, was sold as part of the divestment. In addition, certain property, plant and equipment relating to the former Power Grids business continues to be owned by ABB and is leased to Hitachi Energy Ltd.

The net book value of our property, plant and equipment at December 31, 2022, was \$3,911 million, of which machinery and equipment represented \$1,305 million, land and buildings represented \$2,020 million and construction in progress represented \$586 million. We believe that our current facilities are in good condition and are adequate to meet the requirements of our present and foreseeable future operations.

Item 4A. Unresolved Staff Comments

None

Item 5. Operating and Financial Review and Prospects

The discussion in Item 5 below provides a comparative analysis between 2022 and 2021. See “Item 5. Operating and Financial Review and Prospects” in our Annual Report on Form 20-F for the year ended December 31, 2021, for a comparative discussion and analysis between 2021 and 2020.

Management overview

In 2022, we managed to navigate high customer activity in a complex macroeconomic environment marked by inflation, a strained value chain, an energy crisis, the war in Ukraine with the related economic sanctions on Russia as well as the lingering impacts of the COVID-19 pandemic. During the year, we also worked to fully implement the ABB Way operating model within our Divisions. Our new and more efficient ways of working combined with a strong market situation led to increased operational results. In the wake of the COVID-19 pandemic, ongoing supply chain, logistics and labor challenges emerged, but we were able to avoid major business disruptions with our more agile organization. Our strong price management processes proved effective as we quickly responded to rising input costs and were able to more than offset the higher costs of inflation through price increases during the year.

Active portfolio management continues to be part of our performance culture. On the back of systematic portfolio reviews we ascertain whether, ultimately, ABB is the best owner of the different businesses. We continued to make strong progress in aligning our business portfolio with our purpose, and fully focus on the areas of electrification and automation. We completed the spin-off of the Turbocharging Division in October 2022 and sold the remaining 19.9 percent interest in Hitachi Energy to Hitachi in December. The net cash received from the sale further strengthened our balance sheet, giving us additional flexibility in our capital allocation decisions. Looking forward, after the end of the year, we also reached an agreement in January 2023 to sell our Power Conversion Division to AcBel Polytech Inc. The transaction is subject to regulatory approvals and is expected to be completed in the second half of 2023.

At the same time, we remain committed to our strategy to separately list our E-mobility business subject to constructive market conditions. In the meantime, we received gross proceeds of approximately CHF 200 million (\$216 million) through a private placement of new shares in ABB E-mobility in November 2022. After the end of the year, we obtained an additional amount of funding through the private placement, increasing the total gross proceeds by an additional CHF 325 million (\$351 million) in February 2023. We remain a committed partner to ABB E-mobility with a shareholding of 81 percent as of February 2023.

In addition, our active portfolio management process is driving decisions within the Divisions to improve or exit areas of underperformance and support improved performance ambitions. During 2022 we accelerated the pace of strategic partnerships as well as bolt-on acquisitions driven by the Divisions. The Motion Business Area announced their first two acquisitions in more than a decade, with a combined value of approximately \$125 million. Both the planned acquisition of the Siemens low voltage NEMA motor business (closing in 2023) and the PowerTech Converter acquisition will help the respective Divisions to further strengthen their leading market positions. We have also made minority investments led by our Divisions. Both the InCharge Energy, Inc (In-Charge) and Numocity Technologies Private Ltd (Numocity) majority acquisitions made earlier this year are good examples that minority investments can later also become acquisition targets. As part of our future strategy, we continue to aim to complete five or more bolt-on acquisitions each year.

Business progress

During 2022, demand for ABB's offering was robust, driven by strong demand across all regions and most customer segments, leading to positive developments in both volumes and pricing, the latter of which was largely driven by our quick response to rising input costs which we were able to pass on to our customers. Orders increased in all Business Areas with higher demand in all regions with the Americas seeing the highest growth, while growth in Asia, Middle East, and Africa was lower, driven mainly by lower growth rates in China versus prior year. Overall demand increased for the short-cycle flow business and the systems-driven offerings as well as in service.

While our orders increased 7 percent (13 percent in local currencies) in 2022, revenue growth was lower at 2 percent (9 percent in local currencies). Supply chain constraints and imbalances in the overall supply chain limited our ability to convert orders into actual deliveries resulting in an increase of our order backlog of 20 percent to \$19.9 billion at the end of the year.

Group profitability showed strong improvement during 2022 with segment profit (Operational EBITA) improving in all Business Areas but reflecting approximately 10 percent of negative currency translation impacts compared to 2021. 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 raw material costs and general cost inflation emphasized by the tight supply situation over the year.

Cash flows from operating activities was \$1.3 billion in 2022, a decrease of 61 percent compared to 2021. The profitability improvement was more than offset by the impact of a buildup of working capital, especially inventories, required to support our record high backlog and the impact of higher pay-out of employee bonuses due to the strong financial performance in 2021, as well as 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 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 \$1.2 billion in 2022, or 4 percent of revenues.

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 2023 Annual General Meeting (AGM), the Board of Directors is proposing a dividend of 0.84 Swiss francs per share. During the year we reached our goal of returning \$7.8 billion of the cash proceeds from the Power Grids divestment to shareholders. Under the various share buyback programs we have now purchased in excess of our goal with \$2.8 billion of shares purchased in 2022 in addition to the \$5.5 billion purchased through the end of 2021.

Sustainability strategy 2030

With our 2030 sustainability strategy, 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. Our sustainability focus is part of ABB's commitment to responsible business practices, which are at the center of our comprehensive governance framework, based on integrity and transparency.

Amongst other focus areas in 2022, we announced a new emissions target for our supply chain. We aim to work with our main tier-one suppliers to achieve a 50 percent reduction in their CO₂e emissions by 2030. The target is focused on suppliers covering 70 percent of ABB's annual procurement expenditure. The new target is expected to make an important contribution to our goal of enabling a low carbon society as, in many cases, our suppliers have a bigger footprint than our company. For a detailed discussion of our sustainability strategy 2030 and our progress in 2022, 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 and postretirement benefit 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 in pension costs. Conversely, an increase in the discount rates results in a decrease in the PBO and 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 \$144 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 \$140 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 2022 by \$20 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 \$326 million and \$27 million at December 31, 2022 and 2021, respectively. Our other postretirement plans were underfunded by \$50 million and \$71 million at December 31, 2022 and 2021, 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 “Income 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 one level below our operating 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, the reporting unit's weighted-average cost of capital, the income tax rate and the terminal growth rate.

During 2022, we added one new Division by creating a standalone Division from components of two existing Divisions resulting in twenty-one reporting units in total for the Group at October 1, 2022. Subsequently ABB completed the spin-off of the Turbocharging Division in October 2022. For each change in reporting unit which arose during 2022, an interim quantitative 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.

During 2021, we added three new Divisions by splitting two existing ones into multiple standalone Divisions and announced (in July 2021) the divestment of the Mechanical Power Transmission Division, resulting in twenty reporting units in total for the Group at October 1, 2021. For each change in reporting unit which arose during 2021, an interim quantitative 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 2020, prior to the adoption of the new “ABB Way” operating model on July 1, 2020, goodwill was generally assessed at the level of ABB’s operating segments (one level above the Division, with the exception of Process Automation where the reporting units were the same as the Divisions) while after the change, goodwill impairment was assessed at the Division level. Although the new operating model resulted only in an allocation of goodwill within the operating segments and did not change the segment level goodwill, an interim quantitative impairment test was conducted before and after the July 1 change. As a result of the interim quantitative impairment test, a goodwill impairment charge of \$290 million was recorded in 2020 to reduce the carrying value of the Machine Automation reporting unit to its implied fair value. For more information, please refer to “Note 11 – Goodwill and intangible assets” to ABB’s Consolidated Financial Statements.

At October 1, 2022 and 2021, 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. As a result, we concluded that it was not necessary to perform the quantitative impairment test.

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 “Income 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 2022, we invested \$1,166 million, or approximately 4 percent of our 2022 consolidated revenues, on research and development activities in our continuing operations. We also had expenditures of approximately \$48 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 2022 and 2021, ABB paid \$195 million and \$212 million to purchase 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 Division within our Electrification 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 2020.

Divestments and spin-offs

Spin-off of the Turbocharging Division

In September 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. 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 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 recognizing 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 Power Grids

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, 2022, 2021 and 2020, were as follows:

Exchange rates into \$	2022	2021	2020
EUR 1.00	1.07	1.13	1.23
CHF 1.00	1.08	1.10	1.14
CNY 1.00	0.14	0.16	0.15

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, 2022, 2021 and 2020, were as follows:

Exchange rates into \$	2022	2021	2020
EUR 1.00	1.05	1.18	1.14
CHF 1.00	1.05	1.09	1.07
CNY 1.00	0.15	0.16	0.14

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 2022, approximately 75 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 22 percent, and
- Chinese renminbi, approximately 16 percent.

In 2022, 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 19 percent, and
- Chinese renminbi, approximately 13 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),
- changes in estimates relating to opening balance sheets of acquired businesses (changes in pre-acquisition estimates),
- 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,

- other income/expense relating to the Power Grids joint venture,
- 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 (including impairment of goodwill) and certain other fair value changes, 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.

Analysis of results of operations

Our consolidated results from operations were as follows:

Income Statement Data:

(\$ in millions, except per share data in \$)	2022	2021	2020
Revenues	29,446	28,945	26,134
Cost of sales	(19,736)	(19,478)	(18,256)
Gross profit	9,710	9,467	7,878
Selling, general and administrative expenses	(5,132)	(5,162)	(4,895)
Non-order related research and development expenses	(1,166)	(1,219)	(1,127)
Impairment of goodwill	—	—	(311)
Other income (expense), net	(75)	2,632	48
Income from operations	3,337	5,718	1,593
Interest and dividend income	72	51	51
Interest and other finance expense	(130)	(148)	(240)
Losses from extinguishment of debt	—	—	(162)
Non-operational pension (cost) credit	115	166	(401)
Income tax expense	(757)	(1,057)	(496)
Income from continuing operations, net of tax	2,637	4,730	345
Income (loss) from discontinued operations, net of tax	(43)	(80)	4,860
Net income	2,594	4,650	5,205
Net income attributable to noncontrolling interests and redeemable noncontrolling interests	(119)	(104)	(59)
Net income attributable to ABB	2,475	4,546	5,146

Amounts attributable to ABB shareholders:

Income from continuing operations, net of tax	2,517	4,625	294
Income (loss) from discontinued operations, net of tax	(42)	(79)	4,852
Net income	2,475	4,546	5,146

Basic earnings per share attributable to ABB shareholders:

Income from continuing operations, net of tax	1.33	2.31	0.14
Income (loss) from discontinued operations, net of tax	(0.02)	(0.04)	2.30
Net income	1.30	2.27	2.44

Diluted earnings per share attributable to ABB shareholders:

Income from continuing operations, net of tax	1.32	2.29	0.14
Income (loss) from discontinued operations, net of tax	(0.02)	(0.04)	2.29
Net income	1.30	2.25	2.43

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

(\$ in millions)	2022	2021	2020	% Change	
				2022	2021
Electrification	15,901	14,381	11,884	11%	21%
Motion	7,896	7,616	6,574	4%	16%
Process Automation	6,825	6,779	6,144	1%	10%
Robotics & Discrete Automation	4,116	3,844	2,868	7%	34%
Total Business Areas	34,738	32,620	27,470	6%	19%
Corporate and Other					
Non-core and divested businesses	46	(10)	(31)	n.a.	n.a.
Intersegment eliminations and other	(796)	(742)	(927)	n.a.	n.a.
Total	33,988	31,868	26,512	7%	20%

In 2022, total orders increased 7 percent compared to 2021 (13 percent in local currencies). All Business Areas contributed to the order growth driven by both higher business volumes and price increases, reflecting strong demand across most regions and most customer segments, as well as the impact of successfully passing on rising input costs to end customers. Orders were higher for product and project businesses as well as for service businesses. In addition to strong underlying market demand, orders were also supported by customers placing orders early to secure deliveries in an environment with a generally tight supply chain, especially earlier in the year. As supply chain constraints eased over the year, customer order patterns tended to normalize. Growth rates were highest in the Electrification and Robotics & Discrete Automation Business Areas. Both the Process Automation and Motion Business Areas contributed modest growth, with the former impacted by the spin-off of the Turbocharging Division in October 2022 and the latter impacted by the divestment of the Mechanical Power Transmission business sold in November 2021 which together had a combined negative impact on consolidated order growth of approximately 3 percent. 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:

(\$ in millions)	2022	2021	2020	% Change	
				2022	2021
Europe	11,778	11,857	9,618	(1)%	23%
The Americas	11,825	9,940	7,956	19%	25%
of which: United States	8,920	7,453	5,971	20%	25%
Asia, Middle East and Africa	10,385	10,071	8,938	3%	13%
of which: China	5,087	5,036	4,121	1%	22%
Total	33,988	31,868	26,512	7%	20%

In 2022, orders increased 19 percent in the Americas (20 percent in local currencies), with orders growing in the U.S., Canada, Brazil and Mexico. In Europe, orders decreased 1 percent (increased 13 percent in local currencies) with the Motion and Robotics & Discrete Automation Business Areas reporting order growth. Orders were higher in France, Switzerland, Italy and the United Kingdom while they declined in Germany, Sweden and Finland. In Asia, Middle East and Africa, orders increased 3 percent (9 percent in local currencies) with orders increasing in China, India, Singapore, South Korea and Saudi Arabia while they decreased in Australia.

Order backlog

December 31, (\$ in millions)	2022	2021	2020	% Change	
				2022	2021
Electrification	6,933	5,458	4,358	27%	25%
Motion	4,726	3,749	3,320	26%	13%
Process Automation	6,229	6,079	5,805	2%	5%
Robotics & Discrete Automation	2,679	1,919	1,403	40%	37%
Total Business Areas	20,567	17,205	14,886	20%	16%
Corporate and Other					
Non-core and divested businesses	23	114	139	(80)%	(18)%
Intersegment eliminations	(723)	(712)	(722)	n.a.	n.a.
Total	19,867	16,607	14,303	20%	16%

At December 31, 2022, consolidated order backlog was 20 percent higher (26 percent in local currencies) compared to December 31, 2021. Order backlog increased significantly in most Business Areas with the Process Automation Business Area having only modest growth. The order backlog in the Motion Business Area was driven by order growth in both the short- and long-cycle businesses in most Divisions. Order backlog increased across all Divisions in the Electrification Business Area reflecting the very high order levels with the strongest growth in the E-mobility and Distribution Solutions Divisions. The order backlog in the Process Automation Business Area was supported by a strong order increase in most Divisions except the Marine & Ports Division, which was negatively impacted by an order reversal due to a customer bankruptcy in Germany. The low order backlog growth in the Process Automation Business Area also reflects the spin-off of the Turbocharging Division. The increase in the order backlog in the Robotics & Discrete Automation Business Area was driven by strong growth in both Divisions (Machine Automation and Robotics).

Revenues

(\$ in millions)	2022	2021	2020	% Change	
				2022	2021
Electrification	14,105	13,187	11,924	7%	11%
Motion	6,745	6,925	6,409	(3)%	8%
Process Automation	6,044	6,259	5,792	(3)%	8%
Robotics & Discrete Automation	3,181	3,297	2,907	(4)%	13%
Total Business Areas	30,075	29,668	27,032	1%	10%
Corporate and Other					
Non-core and divested businesses	135	11	(6)	n.a.	n.a.
Intersegment eliminations and other	(764)	(734)	(892)	n.a.	n.a.
Total	29,446	28,945	26,134	2%	11%

In 2022, revenues increased by 2 percent (9 percent in local currencies). During the first half of the year, revenues were hampered as component constraints slowed production and hindered customer deliveries. However, the supply chain challenges progressively eased, triggering higher revenue growth rates in the latter part of the year. All Business Areas benefited from increased volumes and price increases as we were able to pass on the impacts of higher cost inputs to the end customers. Growth rates were highest in the Electrification Business Area. In local currencies, the Motion Business Area achieved a single-digit growth rate despite the adverse impact from the divestment of the Mechanical Power Transmission Division in November 2021. The Process Automation Business Area saw moderate growth in local currencies despite the spin-off of the Turbocharging Division in October 2022. Revenues in the Robotics & Discrete Automation Business Area increased in local currencies, with revenues benefiting in the second half of the year from an easing of component constraints. 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)	2022	2021	2020	% Change	
				2022	2021
Europe	10,286	10,529	9,764	(2)%	8%
The Americas	9,572	8,686	7,949	10%	9%
of which: United States	7,021	6,397	6,027	10%	6%
Asia, Middle East and Africa	9,588	9,730	8,421	(1)%	16%
of which: China	4,696	4,932	4,098	(5)%	20%
Total	29,446	28,945	26,134	2%	11%

In 2022, the increase in revenues was driven by the Americas region, where revenues increased 10 percent (11 percent in local currencies) and were higher across all Business Areas except the Motion Business Area. Revenues increased in the U.S., Canada, Brazil, Mexico, Argentina and Peru. In Europe, revenues decreased 2 percent (increased 12 percent in local currencies) and were higher across all Business Areas except the Motion Business Area, which was flat. Sales were higher in Finland, the United Kingdom and France while revenues were lower in Sweden, Switzerland and Norway. Germany and Italy reported stable sales. In Asia, Middle East and Africa revenues decreased 1 percent (increased 5 percent in local currencies) and revenues grew in the Electrification Business Area while the Process Automation and Robotics & Discrete Automation Business Areas reported a decrease with the Motion Business Area being stable. Revenues increased in India and Singapore while they decreased in China, Saudi Arabia, Australia, Japan and South Korea.

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 2022, costs of sales increased 1 percent (8 percent in local currencies) to \$19,736 million. Cost of sales as a percentage of revenues decreased to 67.0 percent from 67.3 percent in 2021, increasing the gross margin, primarily driven by price increases and certain cost savings actions taken to mitigate higher inflation in labor, commodity prices and freight costs. It is partly offset by a negative impact due to portfolio changes. In 2022, gross margin percentages were higher in the Electrification, Process Automation and Motion Business Areas. The gross margin percentages in the Robotics & Discrete Automation Business Areas were lower in 2022 compared to 2021 due to the impact of higher inflation and lower volume due to general supply chain constraints.

Selling, general and administrative expenses

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

(\$ in millions)	2022	2021	2020
Selling expenses	3,248	3,281	3,087
General and administrative expenses	1,884	1,881	1,808
Total	5,132	5,162	4,895

In 2022, general and administrative expenses were flat (increased 8 percent in local currencies) compared to 2021. The local currency increase principally represents an impact from inflation. As a percentage of revenues, general and administrative expenses slightly decreased to 6.4 percent from 6.5 percent in 2021 mainly due to strong revenue growth compared to more modest cost increases. General and administrative expenses in 2022 continue to include the ongoing costs required to deliver services to Hitachi Energy Ltd and Accelleron (commencing in October 2022) under transition service agreements for which we are compensated and have recorded \$162 million in Other income (expense), net, during 2022 compared to \$173 million in 2021.

In 2022, selling expenses decreased 1 percent (increased 6 percent in local currencies) compared to 2021 and was higher in local currencies across all Business Areas. Spending levels increased as pandemic-related restrictions were gradually relaxed and sales activities increased to keep pace with the strong growth in underlying demand. Selling expenses as a percentage of orders received decreased from 10.3 percent in 2021 to 9.6 percent in 2022 mainly due to strong order growth.

Non-order related research and development expenses

In 2022, non-order related research and development expenses decreased 4 percent (increase 4 percent in local currencies) compared to 2021. In 2022, non-order related research and development expenses as a percentage of revenues remained similar to prior year levels (4.0 percent in 2022 compared to 4.2 percent in 2021) as we continued investing in research and development in line with revenues growth.

Other income (expense), net

(\$ in millions)	2022	2021	2020
Income from provision of services under transition services agreements	221	173	91
Net gain from sale of property, plant and equipment	84	38	37
Gain (loss) from change in fair value of investments in equity securities	52	108	73
Brand income from Hitachi Energy	57	89	60
Favorable resolution of an uncertain purchase price adjustment	15	6	36
Fair value adjustment on assets and liabilities held for sale	—	—	(33)
Net gain (loss) from sale of businesses & equity-accounted investments ⁽¹⁾	36	2,193	(2)
Asset impairments	(55)	(33)	(35)
Income (loss) from equity-accounted companies	(102)	(100)	(66)
Restructuring and restructuring-related expenses ⁽²⁾	(227)	(48)	(87)
Regulatory penalties in connection with Kusile project	(313)	—	—
Other income (expense)	157	206	(26)
Total	(75)	2,632	48

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

(2) Excluding asset impairments

In 2022, Other income (expense), net, was a loss of \$75 million compared to a gain of \$2,632 million in 2021. In 2022, we recorded costs of \$313 million associated with regulatory penalties assessed in connection with the Kusile project and higher restructuring and restructuring-related expenses which included \$195 million in connection with the exit of the full train retrofit business primarily for contract settlement costs. 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 2021, we recorded gains of \$2,193 million in Other income (expense), net for net gains from sales of businesses. This was primarily due to the divestment of the Dodge business. In 2022 compared to 2021, we recorded lower gains for net fair value increases in various equity investments, the most significant of which in 2022 related to InCharge Energy, Inc and in 2021 related to CMR Surgical Ltd.

Income from operations

(\$ in millions)	2022	2021	2020	% Change	
				2022	2021
Electrification	2,159	1,841	1,335	17%	38%
Motion	1,092	3,276	989	(67)%	231%
Process Automation	663	713	344	(7)%	107%
Robotics & Discrete Automation	247	269	(163)	(8)%	n.a.
Total Business Areas	4,161	6,099	2,505	(32)%	143%
Corporate and Other	(823)	(385)	(927)	n.a.	n.a.
Intersegment elimination	(1)	4	15	n.a.	n.a.
Total	3,337	5,718	1,593	(42)%	259%

In 2022 and 2021, 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”, “Interest and other finance expense” and “Losses from extinguishment of debt”.

“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 accrued relating to uncertain tax positions is included within interest expense. “Interest and other finance expense” excludes interest expense which has been allocated to discontinued operations.

(\$ in millions)	2022	2021	2020
Interest and dividend income	72	51	51
Interest and other finance expense	(130)	(148)	(240)
Losses from extinguishment of debt	—	—	(162)

In 2022, increases in market interest rates resulted in both higher interest income on cash deposits and higher interest expense on floating rate debt. Interest expense was lower primarily due to net reversals of interest expense in connection with income tax related contingencies. This was partially offset by the effect of higher rates of interest on floating rate debt as well as higher amounts of outstanding commercial paper.

Non-operational pension (cost) credit

A non-operational pension credit of \$115 million was recorded in 2022 compared to a \$166 million credit in 2021. Compared to 2021, the 2022 non-operational pension credit has decreased due to lower expected returns on plan assets and higher interest costs on the benefit obligations (see “Note 17 - Employee benefits” to our Consolidated Financial Statements).

Income tax expense

(\$ in millions)	2022	2021	2020
Income from continuing operations before taxes	3,394	5,787	841
Income tax expense	(757)	(1,057)	(496)
Effective tax rate for the year	22.3%	18.3%	59.0%

In 2022, the effective tax rate increased to 22.3 percent from 18.3 percent in 2021. The effective tax rate in 2022 was approximately 2 percentage points higher due to the non-deductible regulatory penalties in connection with the Kusile project and 3 percentage points 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. In 2021, the tax impacts related to the sale of the Dodge business reduced the effective tax rate by approximately 5 percentage points. We also realized certain benefits from internal reorganizations in anticipation of this divestment which reduced the effective tax rate by a further 4 percentage points.

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 2021, Income from continuing operations, net of tax, decreased by \$2,093 million to \$2,637 million in 2022.

Income from discontinued operations, net of tax

Income (loss) from discontinued operations, net of tax, in 2022, 2021 and 2020 was as follows:

(\$ in millions)	2022	2021	2020
Total revenues	—	—	4,008
Total cost of sales	—	—	(3,058)
Gross profit	—	—	950
Expenses	(38)	(18)	(808)
Change to net gain recognized on sale of the Power Grids business	(10)	(65)	5,141
Income (loss) from operations	(48)	(83)	5,282
Net interest income (expense) and other finance expense	—	2	(5)
Non-operational pension (cost) credit	—	—	(94)
Income (loss) from discontinued operations before taxes	(48)	(81)	5,182
Income tax	5	1	(322)
Income (loss) from discontinued operations, net of tax	(43)	(80)	4,860

On July 1, 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 have been presented as discontinued operations for all periods presented. 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 Income (loss) from discontinued operations, net of tax.

In 2020, as a result of the sale of the Power Grids business, we recognized a net gain for the sale of the entire Power Grids business which is included in Income from discontinued operations, net of tax. Certain amounts included in the net gain are estimated or otherwise subject to change in value and, as a result, we have recorded additional adjustments in 2022 and 2021, primarily due to the impacts of the final purchase price settlement agreed with Hitachi and net foreign currency losses on certain obligations. We may record additional adjustments in future periods to the gain which are not expected to have a material impact on the Consolidated Financial Statements.

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 2021, Net income attributable to ABB decreased by \$2,071 million to \$2,475 million in 2022.

Earnings per share attributable to ABB shareholders

(in \$)	2022	2021	2020
Basic earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	1.33	2.31	0.14
Income (loss) from discontinued operations, net of tax	(0.02)	(0.04)	2.30
Net income	1.30	2.27	2.44
Diluted earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	1.32	2.29	0.14
Income (loss) from discontinued operations, net of tax	(0.02)	(0.04)	2.29
Net income	1.30	2.25	2.43

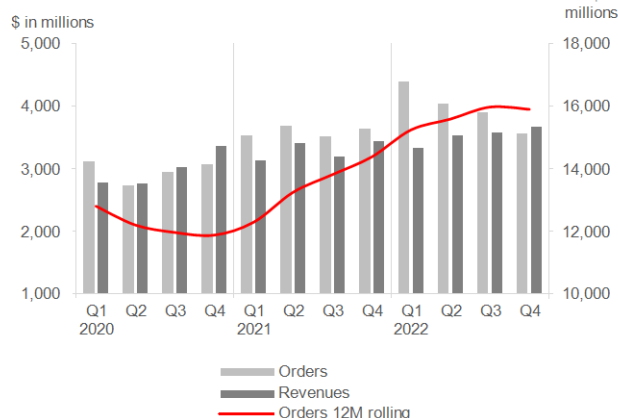
Basic earnings per share is calculated by dividing income by the weighted-average number of shares outstanding during the year. Diluted earnings per share is calculated by dividing income by the weighted-average number of shares outstanding during the year, assuming that all potentially dilutive securities 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

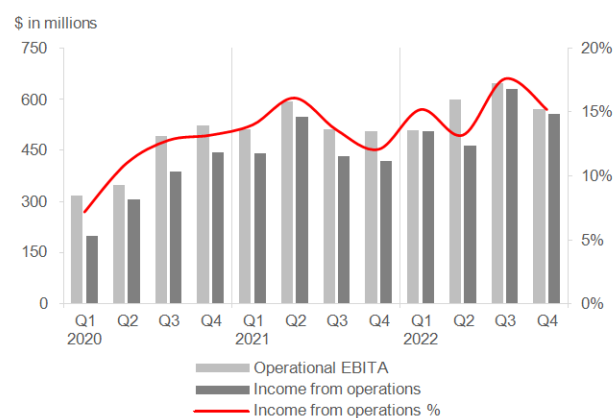
Electrification Business Area

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

Orders and Revenues



Income from operations & Operational EBITA



(\$ in millions)	2022	2021	2020	% Change	
				2022	2021
Orders	15,901	14,381	11,884	11%	21%
Order backlog at December 31,	6,933	5,458	4,358	27%	25%
Revenues	14,105	13,187	11,924	7%	11%
Income from operations	2,159	1,841	1,335	17%	38%
Operational EBITA	2,328	2,121	1,681	10%	26%

Orders

Approximately two-thirds of the Business Area's orders are for products with short delivery 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 2022, orders increased 11 percent (17 percent in local currencies) as demand improved across all key end-user segments. Demand in the buildings segment, the Electrification Business Area's largest end-user 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 partly offset by a slowdown in the second half of 2022, particularly in certain European markets. Substantial growth continues in the e-mobility segment along with 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)	2022	2021	2020
Europe	4,973	5,022	4,149
The Americas	6,776	5,199	4,033
of which: United States	5,273	3,891	3,065
Asia, Middle East and Africa	4,152	4,160	3,702
of which: China	2,028	2,141	1,819
Total	15,901	14,381	11,884

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 1 percent, reflecting the weakening of many European currencies against the U.S. dollar, but increased 13 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, but also reflected a challenging comparable due to strong order performance in 2021.

Order backlog

In 2022, order backlog increased 27 percent (33 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 2022, revenues increased 7 percent (14 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 still 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 E-mobility 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 and Smart Power Divisions.

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

(\$ in millions)	2022	2021	2020
Europe	4,544	4,628	4,190
The Americas	5,372	4,503	4,093
of which: United States	3,940	3,322	3,115
Asia, Middle East and Africa	4,189	4,056	3,641
of which: China	2,004	2,110	1,858
Total	14,105	13,187	11,924

In 2022, revenues in the Americas increased 19 percent (20 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 2 percent, impacted by weakening currencies in many European countries versus the U.S. dollar, while revenues in the region grew 13 percent in local currencies.

Income from operations

In 2022, income from operations increased 17 percent (28 percent in local currencies), 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 contributing to the higher income from operations in 2022 compared to 2021 were higher gains from net fair value increases in various equity investments, the most significant being InCharge Energy, Inc., as well as lower GEIS integration costs. 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:

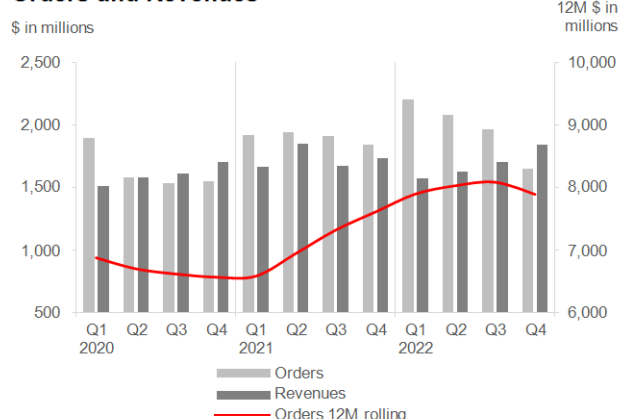
(\$ in millions)	2022	2021	2020
Income from operations	2,159	1,841	1,335
Acquisition-related amortization	116	117	115
Restructuring, related and implementation costs	28	66	145
Changes in obligations related to divested businesses	1	—	15
Changes in pre-acquisition estimates	11	(6)	11
Gains and losses from sale of businesses	(1)	13	4
Fair value adjustment on assets and liabilities held for sale	—	—	33
Favorable resolution of an uncertain purchase price adjustment	—	(5)	(36)
Acquisition- and divestment-related expenses and integration costs	40	70	71
Changes in fair value of investments in equity securities	(57)	(15)	—
Certain other non-operational items	33	15	9
FX/commodity timing differences in income from operations	(2)	25	(21)
Operational EBITA	2,328	2,121	1,681

In 2022, Operational EBITA increased 10 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.

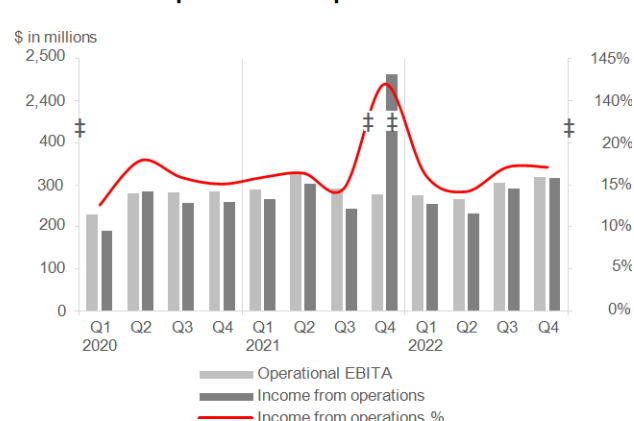
Motion Business Area

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

Orders and Revenues



Income from operations & Operational EBITA



(\$ in millions)	2022	2021	2020	% Change	
				2022	2021
Orders	7,896	7,616	6,574	4%	16%
Order backlog at December 31,	4,726	3,749	3,320	26%	13%
Revenues	6,745	6,925	6,409	(3)%	8%
Income from operations	1,092	3,276	989	(67)%	231%
Operational EBITA	1,163	1,183	1,075	(2)%	10%

Orders

In 2022, orders increased 4 percent (11 percent in local currencies) compared to 2021. Strong market activity as well as effective price management offset negative impacts from both exchange rates and the divestment in November 2021 of the Mechanical Power Transmission Division which negatively impacted the growth rate by approximately 9 percent. The Business Area recorded strong double-digit order growth in local currencies across all Divisions and in key customer segments and benefited from strong order growth in the buildings segment (heating, ventilation, air conditioning and refrigeration) as well as in rail, with solid demand recovery and high year-on-year growth in the chemical, and oil and gas segments. Other segments supporting strong order development include metals, pulp and paper, marine and other segments such as power generation (including wind), food and beverage, and mining. The market shift towards carbon reduction, energy efficiency and digitalization continued to support business growth.

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

(\$ in millions)	2022	2021	2020
Europe	2,710	2,617	2,219
The Americas	2,583	2,677	2,276
of which: United States	2,128	2,200	1,897
Asia, Middle East and Africa	2,603	2,322	2,079
of which: China	1,314	1,232	1,077
Total	7,896	7,616	6,574

In 2022, orders increased 4 percent (18 percent in local currencies) in Europe as orders increased across the region particularly in Türkiye, Italy, Sweden, Germany, France and Poland. In Asia, Middle East and Africa, orders increased 12 percent (18 percent in local currencies) driven by growth in India, China and Australia. In the Americas, orders decreased 4 percent (2 percent in local currencies) reflecting the impact of the divestment of the Mechanical Power Transmission Division, which operated principally in the United States.

Order backlog

Order backlog in 2022 increased 26 percent (33 percent in local currencies) compared to 2021 reaching \$4.7 billion. Order backlog increased across all Divisions and was driven mainly by the large orders received in the long-cycle business. Additionally, supply chain constraints impacted customer deliveries, particularly in the short-cycle business, further adding to the order backlog.

Revenues

In 2022, revenues declined 3 percent (up 5 percent in local currencies) compared to 2021, negatively impacted by approximately 9 percent by the divestment of the Mechanical Power Transmission Division in November 2021. The growth in the other Divisions was supported by strong demand and solid price management particularly in the products business.

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

(\$ in millions)	2022	2021	2020
Europe	2,271	2,258	2,196
The Americas	2,208	2,396	2,225
of which: United States	1,823	1,974	1,867
Asia, Middle East and Africa	2,266	2,271	1,988
of which: China	1,245	1,256	1,040
Total	6,745	6,925	6,409

In 2022, revenues in Europe increased 1 percent (16 percent in local currencies) compared to 2021. Revenue increases in local currencies were driven by Türkiye, Germany, the United Kingdom, Finland and Italy while sales volumes declined in Poland, Switzerland and Austria. In Asia, Middle East and Africa revenues were flat (up 6 percent in local currencies) as revenue growth in India and China was partly offset by declines in Australia and Japan. In the Americas, revenues decreased 8 percent (7 percent in local currencies) impacted by the divestment of the Mechanical Power Transmission Division, which was partially offset by growth in the U.S., particularly in the book-and-bill business in the NEMA Motors Division.

Income from operations

In 2022, income from operations declined 67 percent compared to 2021 as the previous year included a gain of \$2,195 million on the sale of the Mechanical Power Transmission Division. Excluding this gain, income from operations increased 1 percent as higher volume in 2022 offset the impact of the divestment. The higher revenues reflected strong demand and active price management during 2022 which more than offset increasing commodities and freight expenses and other cost inflation. Profitability was also supported by continued cost discipline, focus on operational performance and a positive divisional mix. Changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, negatively impacted income from operations by approximately 4 percent.

Operational EBITA

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

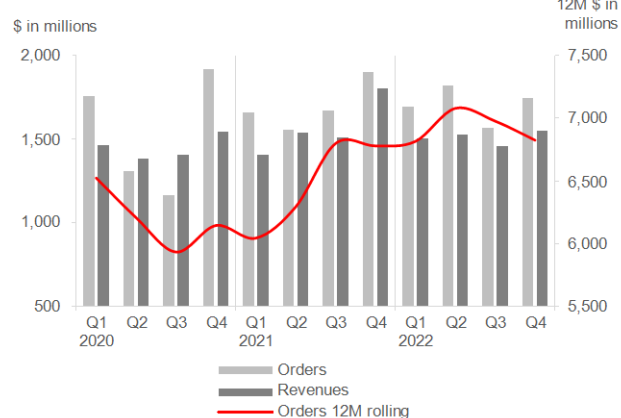
(\$ in millions)	2022	2021	2020
Income from operations	1,092	3,276	989
Acquisition-related amortization	31	43	52
Restructuring, related and implementation costs	16	22	44
Gains and losses from sale of businesses	8	(2,196)	—
Acquisition- and divestment-related expenses and integration costs	15	26	—
Certain other non-operational items	—	1	17
FX/commodity timing differences in income from operations	1	11	(27)
Operational EBITA	1,163	1,183	1,075

In 2022, Operational EBITA decreased 2 percent (increased 6 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.

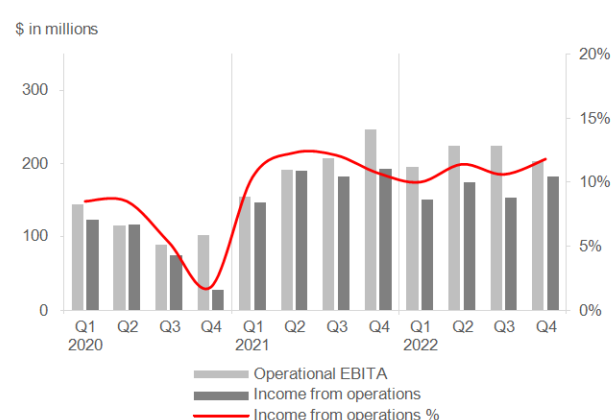
Process Automation Business Area

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

Orders and Revenues



Income from operations & Operational EBITA



(\$ in millions)	2022	2021	2020	% Change	
				2022	2021
Orders	6,825	6,779	6,144	1%	10%
Order backlog at December 31,	6,229	6,079	5,805	2%	5%
Revenues	6,044	6,259	5,792	(3)%	8%
Income from operations	663	713	344	(7)%	107%
Operational EBITA	848	801	451	6%	78%

Orders

In 2022, orders increased 1 percent (8 percent in local currencies) compared to 2021. Order growth was impacted approximately 3 percent due to the spin-off of the Turbocharging Division. Orders grew in all Divisions and were especially strong in the Measurement & Analytics and Process Industries Divisions. 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 chemicals and refining, with positive developments also recorded in the areas of mining, metals, and oil and gas, including the liquefied natural gas sector. Customer activities increased in power generation, pulp and paper, and ports segments, whereas demand in marine was lower. Customer interest was high in the hydrogen segment, which remains a small but growing part of the business.

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

(\$ in millions)	2022	2021	2020
Europe	2,361	2,614	2,365
The Americas	1,994	1,645	1,360
of which: United States	1,201	1,047	770
Asia, Middle East and Africa	2,470	2,520	2,419
of which: China	748	821	590
Total	6,825	6,779	6,144

Orders in Europe decreased 10 percent (increased 2 percent in local currencies). In local currencies and excluding the impact of the spin-off of the Turbocharging Division, orders increased in Poland, Norway, the Netherlands and the United Kingdom while orders decreased in Russia where the ABB Group is winding down remaining business activities and Germany where a customer bankruptcy resulted in an order reversal of approximately \$170 million. Orders in Asia, Middle East and Africa decreased 2 percent (increased 5 percent in local currencies). Higher orders in India, South Korea, Singapore and Saudi Arabia were partly offset by lower order volumes in China and Australia both of which had a higher order intake in 2021. In the Americas, orders increased 21 percent (23 percent in local currencies) supported by strong demand in the U.S., Canada, Argentina and Brazil.

Order backlog

In 2022, order backlog increased 2 percent (8 percent in local currencies) compared to 2021. Order backlog increased in all Divisions due to strong order intake during 2022.

Revenues

In 2022, revenues decreased 3 percent (increased 4 percent in local currencies) compared to 2021 due to foreign currency translation and the impact from the spin-off of the Turbocharging Division business. Revenues increased in all Divisions, reflecting strong execution of the order backlog in the long-cycle businesses and strong underlying demand that was partially held back by challenges from supply chain constraints which hampered customer deliveries.

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

(\$ in millions)	2022	2021	2020
Europe	2,266	2,439	2,395
The Americas	1,569	1,439	1,329
of which: United States	943	836	808
Asia, Middle East and Africa	2,209	2,381	2,068
of which: China	668	742	629
Total	6,044	6,259	5,792

In 2022, revenues were 7 percent lower (1 percent in local currencies) in Asia, Middle East and Africa, 9 percent higher (11 percent in local currencies) in the Americas and 7 percent lower (5 percent higher in local currencies) in Europe compared to 2021. In Asia, Middle East and Africa, revenues were higher in India and Australia but declined in China, Singapore and South Korea. In the Americas, revenue growth was driven by the U.S. and Argentina while revenues in Brazil were steady. Growth in Europe was reported in key markets including Italy, Germany, France, Norway and the United Kingdom.

Income from operations

In 2022, income from operations decreased 7 percent compared to 2021 driven largely by unfavorable foreign currency exchange changes and the impact of the spin-off of the Turbocharging Division. Excluding these impacts, all Divisions reported higher operating income. In local currencies, income growth was driven by higher revenue volumes, operational improvements in project execution, a favorable business mix and discipline in cost controls. The impact from inflation on costs was offset by pricing actions taken to secure gross margin levels, mainly in the short-cycle business. Changes in foreign currencies, including the effect from changes in the FX/commodity timing differences summarized in the table below, negatively impacted income from operations by approximately 10 percent.

Operational EBITA

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

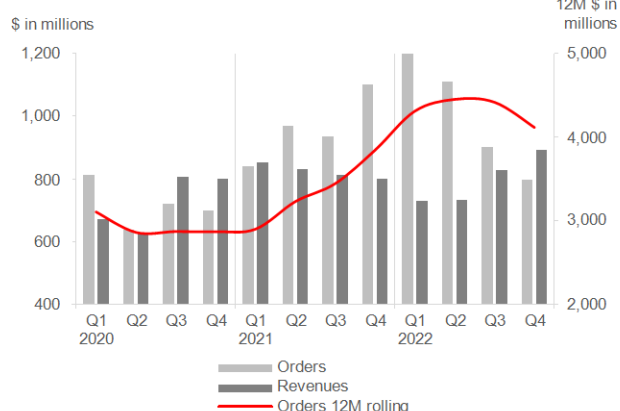
(\$ in millions)	2022	2021	2020
Income from operations	663	713	344
Acquisition-related amortization	4	5	4
Restructuring, related and implementation costs	29	48	125
Gains and losses from sale of businesses	—	(13)	—
Acquisition- and divestment-related expenses and integration costs	134	35	2
Certain other non-operational items	—	1	1
FX/commodity timing differences in income from operations	18	12	(25)
Operational EBITA	848	801	451

In 2022, Operational EBITA increased 6 percent (15 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.

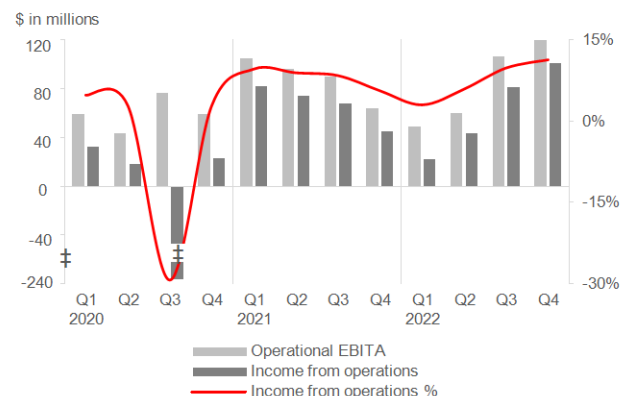
Robotics & Discrete Automation Business Area

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

Orders and Revenues



Income from operations & Operational EBITA



(\$ in millions)	2022	2021	2020	% Change	
				2022	2021
Orders	4,116	3,844	2,868	7%	34%
Order backlog at December 31,	2,679	1,919	1,403	40%	37%
Revenues	3,181	3,297	2,907	(4)%	13%
Income (loss) from operations	247	269	(163)	(8)%	n.a.
Operational EBITA	340	355	237	(4)%	50%

Orders

In 2022, orders increased 7 percent (16 percent in local currencies). Both the Robotics and the Machine Automation Divisions contributed to the robust order growth driven by positive developments in both volumes and pricing, reflecting strong demand across all regions and most of the customer segments. In the automotive sector, demand was particularly driven by EV investments. Strength was also noted in the automotive-related sectors, general industry, machine builders and electronics market sectors. In addition to strong underlying market demand, the order intake was also supported by customers placing orders early in an effort to secure deliveries in an environment with a generally tight supply chain, especially earlier in the year. As supply chain constraints progressively eased over the year, customer order patterns tended to normalize.

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

(\$ in millions)	2022	2021	2020
Europe	2,043	1,978	1,424
The Americas	609	530	388
of which: United States	404	371	277
Asia, Middle East and Africa	1,464	1,336	1,056
of which: China	1,151	976	781
Total	4,116	3,844	2,868

In 2022, orders increased in all regions. Orders in Europe increased 3 percent (16 percent in local currencies) driven by increased demand, mainly in Germany. Orders in the Americas increased 15 percent (15 percent in local currencies) compared to 2021, driven by strong order intake in the U.S. in the Robotics Division. Orders in Asia, Middle East and Africa increased 10 percent (15 percent in local currencies) with strong demand in the Robotics Division in China.

Order backlog

In 2022, order backlog increased 40 percent (49 percent in local currencies) compared to 2021. Order backlog increased in both Divisions. The order backlog benefited from strong order intake, despite our selectivity of orders in the automotive EV segment and also reflected customer deliveries being hampered by material shortages, transportation constraints as well as pandemic-related production pressures in some local markets.

Revenues

In 2022, revenues decreased 4 percent (increased 5 percent in local currencies) compared to 2021. Revenues increased in both Divisions due to higher volumes from book-and-bill business and price increases to compensate for higher input expenses. However, growth in the first half of the year was hindered by component shortages (primarily related to semiconductors) and logistic challenges. Additionally, the COVID-19 related shutdown of the robotics factory in Shanghai, China, in April, with the subsequent gradual ramp up of production during May, had a significant impact on customer deliveries in the second quarter. Service revenues also increased, driven by strong demand from all industry segments.

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

(\$ in millions)	2022	2021	2020
Europe	1,498	1,582	1,481
The Americas	525	441	389
of which: United States	374	309	273
Asia, Middle East and Africa	1,158	1,274	1,037
of which: China	898	950	719
Total	3,181	3,297	2,907

Revenues from Asia, Middle East and Africa decreased 9 percent (decreased 4 percent in local currencies) compared to 2021 due to the impact from the factory shutdown in Shanghai, China, described above. Revenues in Europe decreased 5 percent (increased 8 percent in local currencies) with Austria, Italy and the Czech Republic performing strongly while revenues declined in the United Kingdom. In the Americas, revenues increased 19 percent (increased 19 percent in local currencies) due to strong demand in both Divisions in the U.S. and in the Robotics Division in Brazil, following the recovery from the lower levels in 2021.

Income (loss) from operations

In 2022, the Business Area recorded income from operations of \$247 million compared to \$269 million in 2021, with both Divisions contributing to the higher income level. The operational performance in 2022 reflected improved sales volumes, price increases, a favorable change in the revenue mix, and the benefit of cost reduction measures taken in the second half of 2022. These positive drivers were partially offset by widespread inflationary cost pressures in 2022 as well as under absorption of fixed costs due to volumes being hampered by component shortages, particularly in the first 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 14 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)	2022	2021	2020
Income (loss) from operations	247	269	(163)
Acquisition-related amortization	78	83	78
Restructuring, related and implementation costs	11	7	26
Changes in pre-acquisition estimates	(1)	—	—
Favorable resolution of an uncertain purchase price adjustment	(15)	—	—
Acquisition- and divestment-related expenses and integration costs	6	1	—
Impairment of goodwill	—	—	290
Certain other non-operational items	8	—	5
FX/commodity timing differences in income from operations	6	(5)	1
Operational EBITA	340	355	237

In 2022, Operational EBITA decreased 4 percent (increased 8 percent excluding the impact from changes in foreign currency exchange rates) compared to 2021, primarily due to the reasons described under “Income (loss) 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)	2022	2021	2020
Corporate headquarters and stewardship	(430)	(399)	(334)
Regulatory penalty in connection with Kusile project	(313)	—	—
Loss from equity-accounted companies	(101)	(102)	(68)
Other corporate costs	(25)	(29)	(65)
Corporate brand income from Hitachi Energy	57	89	60
Net gain (loss) from sale of businesses ⁽¹⁾	43	(3)	2
Corporate real estate	66	41	54
Restructuring costs in Corporate	—	(5)	(46)
Fair value adjustment on equity securities	(4)	94	71
OS implementation costs	—	—	(24)
Digital program costs	—	—	(45)
Corporate research and development	—	—	(49)
Costs for divestment of Power Grids	—	—	(86)
Stranded corporate costs	—	—	(40)
Divested businesses and other non-core activities	(117)	(67)	(342)
Total Corporate and Other	(824)	(381)	(912)

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

In 2022, the net loss from operations within Corporate and Other increased by \$443 million to \$824 million compared to 2021. This increase was driven by costs associated with regulatory penalties assessed in connection with the Kusile project, restructuring expenses in connection with the exit of the full train retrofit business and lower gains for fair value adjustments on equity investments. Partly offsetting these negative impacts was the reversal of a provision that we had previously recorded related to one of our divested businesses and the gain in December 2022 from the sale of the remaining 19.9 percent of Hitachi Energy to Hitachi.

Corporate

In 2022, Corporate headquarters and stewardship costs increased by \$31 million, mainly due to higher external consulting costs as part of the implementation of the ABB Way operating model. Excluding this, Corporate headquarters and stewardship costs were lower, supported by lower costs especially in the corporate legal function.

During 2022, we did not have any significant revaluations of equity investments while in 2021 we recognized gains of \$94 million for investments in our corporate equity ventures portfolio.

Corporate brand income results from the granting of 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 2022, income from operations in corporate real estate included gains from the sale of real estate properties of approximately \$73 million compared to \$22 million in 2021.

Other corporate costs consists of operational costs of our Corporate Treasury Operations and other minor items including changes of the elimination related to internal profit of inventory.

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 2022 and 2021, the amounts represent charges and losses relating to divested businesses and the winding down of the remaining EPC projects. In 2022, we recorded a restructuring expense of \$195 million in connection with the exit of the full train retrofit business primarily for contract settlement costs. This was offset in part 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. In 2021, we recorded losses of \$67 million which were mostly related to the full train retrofit business but also related to legacy EPC projects and the divested oil & gas EPC business.

At December 31, 2022, 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 2022, we also received significant funds from the sale of our remaining investment in Hitachi Energy which was sold in December 2022.

Our net debt/cash is shown in the table below:

December 31, (\$ in millions)	2022	2021
Short-term debt and current maturities of long-term debt	2,535	1,384
Long-term debt	5,143	4,177
Cash and equivalents	(4,156)	(4,159)
Restricted cash - current	(18)	(30)
Marketable securities and short-term investments	(725)	(1,170)
Restricted cash - non-current	—	(300)
Net debt (cash) (defined as the sum of the above lines)	2,779	(98)

During 2022, cash generation from operating activities was lower than in 2021 while we increased our total cash payments to shareholders in the form of dividends and purchases of treasury stock. These factors were the primary contributors to the change in net debt as presented in the table above.

During 2022, we changed from a net cash position of \$98 million at December 31, 2021, to a net debt position of \$2,779 million at December 31, 2022. The effect of the exchange rate movements reduced net debt by approximately \$30 million. In 2022, we received net proceeds of \$1,552 million for the sale of our remaining investment in Hitachi Energy. We generated cash flows from operating activities during 2022 of \$1,287 million and sold treasury stock in relation to our employee share plans for \$394 million. We also issued shares in our subsidiary ABB E-Mobility to third parties in private placements for \$216 million. These items were more than offset by amounts for purchases of treasury shares of \$3,553 million, including \$2,891 million relating to the announced buybacks of our shares, as well as \$1,698 million for the payment of the dividend to our shareholders. We made net purchases of property, plant and equipment and intangible assets of \$635 million and made payments of dividends to noncontrolling shareholders totaling \$99 million. See “Financial position”, “Investing activities” and “Financing activities” for further details.

Our Corporate Treasury Operations 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, 2022 and 2021, the proportion of our aggregate “Cash and equivalents” (including restricted cash) and “Marketable securities and short-term investments” managed by our Corporate Treasury Operations amounted to approximately 51 percent and 44 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 41 percent of our cash and equivalents held at December 31, 2022, was in U.S. dollars, while the most significant foreign currencies in which cash and equivalents was held was euros (21 percent) and Indian rupees (10 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)	2022	2021
Short-term debt and current maturities of long-term debt	2,535	1,384
Long-term debt:		
Bonds	4,944	3,984
Other long-term debt	199	193
Total debt	7,678	5,561

The increase in short-term debt in 2022 was due primarily to the increase in commercial paper outstanding offset partially by a reduction in Current maturities of long-term debt.

At December 31, 2022, Long-term debt was \$966 million higher compared to the end of 2021 due to the issuance of five new instruments which remain classified as Long-term debt at December 31, 2022 (EUR 700 million 0.625% Instruments due 2024, EUR 500 million floating rate Instruments due 2024, CHF 150 million 2.1% Bonds due 2025, CHF 425 million 0.75% Bonds due 2027 and CHF 150 million 2.375% Bonds due 2030) offset partially by the reclassification to current of the EUR 700 million 0.625% Instruments, due 2023. The increase in interest rates also resulted in a reduction in our long-term debt of approximately \$200 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, 2022, the effective average interest rate on our floating rate long-term debt (including current maturities) of \$3,459 million and our fixed rate long-term debt (including current maturities) of \$2,771 million was 2.8 percent and 2.2 percent, respectively. This compares with an effective rate of 0.3 percent for floating rate long-term debt of \$3,598 million and 3.1 percent for fixed rate long-term debt of \$1,885 million at December 31, 2021.

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 further extend the maturity to 2026. No amount was drawn under the facility at December 31, 2022 and 2021. 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.

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, 2022, 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, 2022 and 2021, there was no amount outstanding under the \$2 billion program in the United States.

At December 31, 2022, \$1,383 million was outstanding under the \$2 billion Euro-commercial paper program. There was no amount outstanding at December 31, 2021.

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, 2022, five bonds (principal amount of EUR 700 million, due in 2023, 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, and principal amount of EUR 800 million, due in 2030) having a combined carrying amount of \$3,444 million were outstanding under the program. The carrying amount of the three bonds outstanding under the program at December 31, 2021, was \$2,522 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, 2022 and 2021, our long-term debt was rated A3 by Moody’s and currently with a Stable outlook. At December 31, 2022 and 2021, our long-term debt was rated A- by Standard & Poor’s and currently 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: China, Egypt, India, Malaysia, the Russian Federation, South Africa, South Korea, Taiwan (Chinese Taipei), Thailand, Türkiye 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. As a consequence, these funds are not available within our Corporate Treasury Operations 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, 2022 and 2021, 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 approximately \$1,381 million and \$2,074 million, respectively.

During 2022, we continued to direct our subsidiaries in countries with restrictions to place such cash with our core banks or investment grade banks, 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)	2022	2021	% Change
Current assets			
Cash and equivalents	4,156	4,159	0%
Restricted cash	18	30	(40)%
Marketable securities and short-term investments	725	1,170	(38)%
Receivables, net	6,858	6,551	5%
Contract assets	954	990	(4)%
Inventories, net	6,028	4,880	24%
Prepaid expenses	230	206	12%
Other current assets	505	573	(12)%
Current assets held for sale and in discontinued operations	96	136	(29)%
Total current assets	19,570	18,695	5%

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 decreased in 2022. The change primarily reflects lower amounts placed in bank time deposits and a reduction 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 5 percent (12 percent in local currencies) reflecting the higher revenues (due to both higher business volumes and higher prices) at the end of 2022 compared to 2021. Receivables also decreased 3 percent due to the spin-off of the Turbocharging Division.

Contract assets decreased 4 percent (increased 2 percent in local currencies). Contract assets decreased 2 percent due to the spin-off of the Turbocharging Division with the remaining local currency increase of 4 percent reflecting higher levels of business activity at the end of 2022 compared to 2021.

Inventories, net, increased 24 percent (32 percent in local currencies) and were significantly higher in all inventory categories. A portion of this increase reflects higher business activities at the end of 2022 compared to 2021 as well as higher inventories in order to fulfil the higher order backlog. We also had a significant build-up in the amount of raw materials as well as cost increases for materials. Supply chain challenges and shortages in the availability of some items have created the need for our businesses to stockpile certain key components. These challenges have also resulted in some delays in completing and delivering finished goods. The impact of the spin-off of the Turbocharging Division was a reduction of Inventories, net, of 3 percent.

Current assets held for sale and in discontinued operations decreased to \$96 million from \$136 million. These amounts primarily relate to working capital for certain contracts relating to the former Power Grids business which remain with ABB and are being executed over time for the direct benefit of Hitachi Energy. For the details of the assets of the Power Grids business see “Note 3 - Discontinued operations” to our Consolidated Financial Statements.

December 31, (\$ in millions)	2022	2021	% Change
Current liabilities			
Accounts payable, trade	4,904	4,921	0%
Contract liabilities	2,216	1,894	17%
Short-term debt and current maturities of long-term debt	2,535	1,384	83%
Current operating leases	220	230	(4)%
Provisions for warranties	1,028	1,005	2%
Other provisions	1,171	1,386	(16)%
Other current liabilities	4,323	4,367	(1)%
Current liabilities held for sale and in discontinued operations	132	381	(65)%
Total current liabilities	16,529	15,568	6%

Accounts payable, trade, remained flat (increase 6 percent in local currencies) while the spin-off of the Turbocharging Division reduced the balance by 2 percent. The local currency increase reflects higher inventory purchases but the increase was muted as payment terms with suppliers have become somewhat less favorable in a constrained supply chain environment.

Contract liabilities increased 17 percent (increased 24 percent in local currency) reflecting higher levels of business activity at the end of 2022 compared to 2021. The spin-off of the Turbocharging Division reduced the amount by 1 percent.

The increase in short-term debt and current maturities of long-term debt in 2022 was due to an increase of commercial paper borrowings under the Euro-commercial paper program and the reclassification to current of the EUR 700 million 0.625% Instruments, due 2023, offset partially by the repayment at maturity of the USD 1,250 million 2.875% Notes, due 2022.

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 2 percent (7 percent in local currencies). The spin-off of the Turbocharging Division reduced the amount by 2 percent. The local currency increase reflects the higher provisioning in 2022 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.

Current liabilities held for sale and in discontinued operations decreased to \$132 million from \$381 million. The decrease included the settlement of \$136 million for certain indemnification guarantees which were provided in connection with the original sale of the Power Grids business to Hitachi. The remaining amounts primarily relate to certain working capital balances of the former Power Grids business as described above.

December 31, (\$ in millions)	2022	2021	% Change
Non-current assets			
Restricted cash, non-current	—	300	(100)%
Property, plant and equipment, net	3,911	4,045	(3)%
Operating lease right-of-use assets	841	895	(6)%
Investments in equity-accounted companies	130	1,670	(92)%
Prepaid pension and other employee benefits	916	892	3%
Intangible assets, net	1,406	1,561	(10)%
Goodwill	10,511	10,482	0%
Deferred taxes	1,396	1,177	19%
Other non-current assets	467	543	(14)%
Total non-current assets	19,578	21,565	(9)%

The non-current Restricted cash at December 31, 2021, related to certain amounts received on the initial sale of the Power Grids business in 2020 which were placed in escrow, pending resolution of certain of our contractual obligations to Hitachi. See “Note 3 - Discontinued operations” to our Consolidated Financial Statements. In connection with the sale of the remaining ownership in Hitachi Energy to Hitachi in December 2022, the restrictions on the bank account where this cash was deposited were removed.

In 2022, Property, plant and equipment, net, decreased 3 percent (increased 2 percent in local currencies). The spin-off of the Turbocharging Division reduced this balance by 4 percent.

In 2022, Goodwill remained flat (increased 2 percent in local currencies). The local currency increase primarily reflects the purchase of In-Charge.

Intangible assets, net, decreased 10 percent (8 percent in local currencies). Acquisitions of businesses, primarily In-Charge, increased Intangible assets, net, by 5 percent. For additional information on goodwill and intangible assets see “Note 11 - Goodwill and intangible assets” to our Consolidated Financial Statements.

The balance for Investment in equity-accounted companies at December 31, 2021, primarily represented our remaining 19.9 percent interest in the Hitachi Energy joint venture. We sold this remaining interest in December 2022. For additional information on investments in equity-accounted companies see “Note 4 - Acquisitions, divestments and equity-accounted companies” to our Consolidated Financial Statements.

Prepaid pension and other employee benefits increased 3 percent (6 percent in local currencies). The spin-off of the Turbocharging Division reduced this balance by 10 percent. For additional information on Pension and employee benefits see “Note 17 - Employee benefits” to our Consolidated Financial Statements.

In 2022, Deferred taxes increased 19 percent (26 percent in local currencies). For details on deferred tax assets see “Note 16 - Income taxes” to our Consolidated Financial Statements.

December 31, (\$ in millions)	2022	2021	% Change
Non-current liabilities			
Long-term debt	5,143	4,177	23%
Non-current operating leases	651	689	(6)%
Pension and other employee benefits	719	1,025	(30)%
Deferred taxes	729	685	6%
Other non-current liabilities	2,085	2,116	(1)%
Non-current liabilities held for sale and in discontinued operations	20	43	(53)%
Total non-current liabilities	9,347	8,735	7%

Long-term debt increased 23 percent. The balance at December 31, 2022, includes five instruments newly issued in 2022: i) EUR 700 million 0.625% Instruments due 2024, ii) EUR 500 million floating rate Instruments due 2024, iii) CHF 150 million 2.1% Bonds due 2025, iv) CHF 425 million 0.75% Bonds due 2027 and v) CHF 150 million 2.375% Bonds due 2030. This was partially offset by the reclassification to current of the EUR 700 million 0.625% Instruments, due 2023, as well as a reduction of 5 percent in reported amounts due to fair value hedge accounting adjustments. Foreign currency movements also reduced the balance by 3 percent over the year. 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 30 percent (26 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.

Non-current liabilities held for sale and in discontinued operations relate to the sale in 2020 of the Power Grids business. For the details of the liabilities of the Power Grids business see “Note 3 - Discontinued operations” 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)	2022	2021	2020
Net cash provided by operating activities	1,287	3,330	1,693
Net cash provided by investing activities	981	2,307	6,760
Net cash used in financing activities	(2,394)	(4,968)	(8,175)
Effects of exchange rate changes on cash and equivalents	(189)	(81)	79
Net change in cash and equivalents and restricted cash	(315)	588	357

Operating activities

(\$ in millions)	2022	2021	2020
Net income	2,594	4,650	5,205
Loss (income) from discontinued operations, net of tax	43	80	(4,860)
Depreciation and amortization	814	893	915
Total adjustments to reconcile net income to net cash provided by operating activities (excluding depreciation and amortization)	(434)	(2,593)	263
Total changes in operating assets and liabilities	(1,683)	308	352
Net cash provided by operating activities — continuing operations	1,334	3,338	1,875
Net cash used in operating activities — discontinued operations	(47)	(8)	(182)

Cash flows from operating activities in continuing operations in 2022 provided net cash of \$1,334 million, a decrease of 60 percent compared to 2021 of which 7 percent was due to movements in exchange rates. In addition, in 2022, we had lower cash effective net income (i.e. net income from continuing operations adjusted for depreciation, amortization and other non-cash items) partially due to costs associated with business transformation activities, higher costs relating to business restructuring and costs for the spin-off of the Turbocharging Division and other business portfolio transactions. In 2022, this reduction was also impacted by payments of approximately \$315 million in relation to regulatory penalties for the Kusile project.

In 2022, an increase in both business volumes and inflation-driven cost and price changes resulted in growth in our working capital. Changes in operating assets and liabilities reflected a high buildup of inventory with a less favorable timing of inventory payments, an increase in amounts receivable from customers as well as the timing of payments for accrued liabilities, including higher employee bonuses paid in 2022 compared to 2021. Cash paid for income taxes decreased to \$1,188 million from \$1,292 million, reflecting the higher current income taxes in 2021, including tax impacts from the sales of businesses. In 2022 and 2021, there were no significant cash flows from operating activities of discontinued operations.

Investing activities

(\$ in millions)	2022	2021	2020
Purchases of investments	(321)	(1,528)	(5,933)
Purchases of property, plant and equipment and intangible assets	(762)	(820)	(694)
Acquisition of businesses (net of cash acquired) and increases in cost- and equity-accounted companies	(288)	(241)	(121)
Proceeds from sales of investments	697	2,272	4,341
Proceeds from maturity of investments	73	81	11
Proceeds from sales of property, plant and equipment	127	93	114
Proceeds from sales of businesses (net of transaction costs and cash disposed) and cost- and equity-accounted companies	1,541	2,958	(136)
Net cash from settlement of foreign currency derivatives	(166)	(121)	138
Changes in loans receivable, net	320	(19)	(3)
Other investing activities	(14)	(4)	11
Net cash provided by (used in) investing activities — continuing operations	1,207	2,671	(2,272)
Net cash provided by (used in) investing activities — discontinued operations	(226)	(364)	9,032

Net cash provided by investing activities for continuing operations in 2022 was \$1,207 million compared to \$2,671 million during 2021, a decrease of \$1,464 million. 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, included in Changes in loans receivable, net, are 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. In 2021, we received proceeds of \$2,958 million in connection with sales of businesses, primarily from the sale of the Dodge business.

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

(\$ in millions)	2022	2021	2020
Construction in progress	540	479	493
Purchase of machinery and equipment	127	150	134
Purchase of land and buildings	26	158	17
Purchase of intangible assets	69	33	50
Purchases of property, plant and equipment and intangible assets	762	820	694

Cash expenditures for acquisitions of businesses in 2022 primarily reflects the amount paid to acquire In-Charge while the amount in 2021 primarily reflects the acquisition of ASTI.

Cash flows used in investing activities for discontinued operations includes amounts relating to the original sale of the Power Grids business to Hitachi. We sold this business in 2020 and reported net cash proceeds of \$9,168 million in that year. 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 2022 and 2021, these uncertain elements of the purchase price, including the original indemnification guarantees, were finalized and we made payments related to the purchase price and certain other obligations totaling \$227 million and \$364 million, respectively.

Financing activities

(\$ in millions)	2022	2021	2020
Net changes in debt with maturities of 90 days or less	1,366	(83)	(587)
Increase in debt	3,849	1,400	343
Repayment of debt	(2,703)	(1,538)	(3,459)
Delivery of shares	394	826	412
Purchase of treasury stock	(3,553)	(3,708)	(3,048)
Dividends paid	(1,698)	(1,726)	(1,736)
Cash associated with the spin-off of the Turbocharging Division	(172)	—	—
Dividends paid to noncontrolling shareholders	(99)	(98)	(82)
Proceeds from issuance of subsidiary shares	216	—	—
Other financing activities	6	(41)	(49)
Net cash used in financing activities — continuing operations	(2,394)	(4,968)	(8,206)
Net cash provided by financing activities — discontinued operations	—	—	31

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 2022, we also distributed cash as part of the spin-off of the Turbocharging Division.

In 2022, the net inflow for debt with maturities of 90 days or less related to net borrowings of amounts outstanding under the Euro-commercial paper program and various local country borrowings.

In 2022, “Increase in debt” primarily represents initial borrowings for terms longer than 90 days under the Euro-commercial paper program of \$1,425 million and borrowings under the following six long-term debt transactions (total cashflow amount at date of borrowings of \$2,390 million):

- CHF 275 million 0% Bonds due 2023
- EUR 700 million 0.625% Instruments due 2024
- EUR 500 million floating rate Instruments due 2024
- CHF 150 million 2.1% Bonds due 2025
- CHF 425 million 0.75% Bonds due 2027
- CHF 150 million 2.375% Bonds due 2030

In 2022, “Repayment of debt” includes the repayment at maturity of the USD 1,250 million Notes and repayments of \$1,345 million under the Euro-commercial paper program for borrowings having terms longer than 90 days.

“Delivery of shares” in 2022 primarily reflects cash received from the exercise of options in connection with our Management Incentive Plan (resulting in a delivery of 16 million shares). All shares were delivered out of Treasury stock.

“Proceeds from issuance of subsidiary shares” in 2022 relates to the sale of shares by ABB E-mobility Holdings Ltd through a private placement of \$216 million.

In 2022, “Purchase of treasury stock” reflects \$2,891 million of cash payments to purchase 91 million of our own shares in connection with the announced share buyback programs. It also reflects \$662 million paid to purchase 20 million shares on the open market during the year.

“Cash associated with the spin-off of the Turbocharging Division” represents the amount of cash and cash equivalents which were directly owned by the entities in the spin-off of the Turbocharging Division at the date of the spin-off.

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, 2022. 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, 2022, 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, 2022 (\$ in millions)	Current	Non-current	Total
Long-term debt obligations	1,058	5,235	6,293
Interest payments related to long-term debt obligations	70	629	699
Purchase obligations	3,519	949	4,468
Total	4,647	6,813	11,460

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.

December 31, (\$ in millions)	Maximum potential payments ⁽¹⁾	
	2022	2021
Performance guarantees	4,300	4,540
Financial guarantees	96	52
Indemnification guarantees ⁽²⁾	—	136
Total	4,396	4,728

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

(2) Certain indemnifications provided to Hitachi in connection with the divestment of Power Grids were without limit.

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, 2022 and 2021, amounted to \$1 million and \$156 million, respectively, the majority of which in 2021 is included in discontinued operations.

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, 2022 and 2021, the total outstanding performance bonds aggregated to \$2.9 billion and \$3.6 billion, respectively; of each of these amounts, \$0.1 billion relates to discontinued operations. There have been no significant amounts reimbursed to financial institutions under these types of arrangements in 2022 and 2021.

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

Item 6. Directors, Senior Management and Employees

Summary of corporate governance approach

Corporate governance - general principles

ABB is committed to the highest international standards of corporate governance and this is reinforced in its structure, processes and rules as outlined in this report. In line with this, ABB complies with the general principles as set forth in the Swiss Code of Best Practice for Corporate Governance, as well as those of the capital markets where its shares are listed and traded. In addition to the provisions of the Swiss Code of Obligations, ABB’s key principles and rules on corporate governance are laid down in ABB’s Articles of Incorporation, the ABB Ltd Board Governance Rules (which include the governance rules of ABB’s Board committees and the ABB Ltd Related Party Transaction Policy, which was prepared based on the Swiss Code of Best Practice for Corporate Governance and the independence criteria set forth in the corporate governance rules of the New York Stock Exchange), and the ABB Code of Conduct. These documents are available on ABB’s website at <https://new.abb.com/about/corporate-governance>. It is the duty of ABB’s Board of Directors (the Board) to review and amend or propose amendments to those documents from time to time to reflect the most recent developments and practices, as well as to ensure compliance with applicable laws and regulations. Shareholders and other interested parties may communicate with the Chairman of the Board or the independent directors by writing to ABB Ltd (Attn: Chairman of the Board/independent directors), at Affolternstrasse 44, CH-8050 Zurich, Switzerland.

Swiss corporate law has been revised, effective as of January 1, 2023. The main objectives of the revision are to strengthen shareholder rights, improve corporate governance and modernize corporate law in general. Swiss corporations are required to amend their articles of incorporation for compliance with the new law by the end of 2024 at the latest. ABB will propose the necessary changes to its Articles of Incorporation for approval by shareholders at its Annual General Meeting in March 2023. These changes will impact certain of the provisions referred to in this report.

Compensation governance and Board and EC compensation

Information about ABB's compensation governance as well as Board and Executive Committee (EC) compensation and shareholdings is provided in the in the section titled "Compensation" below.

Board of Directors

Board and Board committees (2022 - 2023 Board term)

Board of Directors		
Chairman: Peter R. Voser	Gunnar Brock	Jennifer Xin-Zhe Li
Vice-Chairman: Jacob Wallenberg	David Constable	Geraldine Matchett
	Frederico Fleury Curado	David Meline
	Lars Förberg	Satish Pai

Finance, Audit and Compliance Committee	Governance and Nomination Committee	Compensation Committee
David Meline (chairman)	Peter R. Voser (chairman)	Frederico Fleury Curado (chairman)
Gunnar Brock	Lars Förberg	David Constable
Geraldine Matchett	Jennifer Xin-Zhe Li	Jennifer Xin-Zhe Li
Satish Pai	Jacob Wallenberg	

Board governance

The Board

The Board defines the ultimate direction of the business of ABB and issues the necessary instructions. It determines the organization of the ABB Group and appoints, removes and supervises the persons entrusted with the executive management and representation of ABB. The internal organizational structure and the definition of the areas of responsibility of the Board, as well as the information and control instruments vis-à-vis the Executive Committee are set forth in the ABB Ltd Board Governance Rules (available at <https://new.abb.com/about/corporate-governance>).

The Board takes decisions as a whole, supported by its three committees: the Finance, Audit and Compliance Committee (FACC), the Governance and Nomination Committee (GNC), and the Compensation Committee (CC). These committees assist the Board in its tasks and report regularly to the Board. The Board and its committees meet regularly throughout the year.

The directors and officers of a Swiss corporation are bound, as specified in the Swiss Code of Obligations, to perform their duties with all due care, to safeguard the interests of the corporation in good faith and to extend equal treatment to shareholders in like circumstances. Prior to proposing new candidates for election to the Board, checks are performed to ensure that they are independent and that there are no conflicts of interest.

The Swiss Code of Obligations does not specify what standard of due care is required of the directors of a corporate board. However, it is generally held by Swiss legal scholars and jurisprudence that the directors must have the requisite capability and skills to fulfill their function, and must devote the necessary time to the discharge of their duties. Moreover, the directors must exercise all due care that a prudent and diligent director would have taken in like circumstances. Finally, the directors are required to take actions in the best interests of the corporation and may not take any actions that may be harmful to the corporation.

Although the Swiss Code of Obligations does not discuss specifically conflicts of interest for board members, the ABB Ltd Board Governance Rules (available at <https://new.abb.com/about/corporate-governance>) state that Board members shall avoid entering into any situation in which their personal or financial interests may conflict with the interests of ABB.

Chairman of the Board

The Chairman is elected by the shareholders to represent their interests in creating sustainable value through effective governance. In addition, the Chairman (1) takes provisional decisions on behalf of the Board on urgent matters where a regular Board decision cannot be obtained, (2) calls for Board meetings and sets the related agendas, (3) interacts with the CEO and other EC members on a more frequent basis outside of Board meetings and (4) represents the Board internally and in the public sphere.

Vice-Chairman of the Board

The Vice-Chairman is elected by the Board and handles the responsibilities of the Chairman to the extent the Chairman is unable to do so or would have a conflict of interest in doing so. He also acts as counselor/advisor to the Chairman on any matters that are Company or Board relevant and as appropriate or as the Chairman may require and with a particular focus on strategic aspects related to the Company and its business in general. In addition, the Vice-Chairman takes such other actions as may be decided by the Board or requested by the Chairman.

Finance, Audit and Compliance Committee

The FACC is responsible for overseeing (1) the integrity of ABB's financial statements, (2) ABB's compliance with legal, tax and regulatory requirements, (3) the external auditors' qualifications and independence, (4) the performance and role of ABB's internal audit function and the performance of the external auditors, (5) ABB's capital structure, funding requirements and financial and risk policies, and (6) ABB's implementation and maintenance of an integrity program and internal controls designed to mitigate integrity risk.

The FACC must comprise three or more independent directors who have a thorough understanding of finance and accounting. The Chairman of the Board and, upon invitation by the committee's chairman, the CEO or other members of the Executive Committee may participate in the committee meetings, provided that any potential conflict of interest is avoided and confidentiality of the discussions is maintained. In addition, the chief integrity officer, the head of internal audit and the external auditors participate in the meetings as appropriate. The Board has determined that each member of the FACC is an audit committee financial expert as such term is defined in Form 20-F.

Governance and Nomination Committee

The GNC is responsible for (1) overseeing corporate governance practices within ABB, (2) overseeing corporate social responsibility (including health, safety and environment as well as sustainability), (3) nominating candidates for the Board, the role of the CEO and other positions on the Executive Committee, and (4) succession planning and employment matters relating to the Board and the Executive Committee. The GNC is also responsible for maintaining an orientation program for new Board members and an ongoing education program for existing Board members.

The GNC must comprise three or more independent directors. Upon invitation by the committee's chairman, the CEO or other members of the Executive Committee may participate in the committee meetings, provided that any potential conflict of interest is avoided and confidentiality of the discussions is maintained.

Compensation Committee

The CC is responsible for compensation matters relating to the Board and the Executive Committee.

The CC must comprise three or more directors who are elected by the shareholders. The Chairman of the Board and, upon invitation by the committee's chairman, the CEO or other members of the Executive Committee may participate in the committee meetings, provided that any potential conflict of interest is avoided and confidentiality of the discussions is maintained.

Board membership

Board composition

In proposing individuals to be elected to the Board, the Board seeks to align the composition and skills of the Board with the Company's strategic needs, business portfolio, geographic reach and culture. The Board strives for diversity in all aspects including gender, nationalities, geographic/regional experience and business experience. In addition, the average tenure of the members of the Board should be well-balanced. The Board also considers the number of other mandates of each Board member to ensure that he/she will have sufficient time to dedicate to his/her role as an ABB Board member.

Elections and term of office

The members of the Board of Directors and the Chairman of the Board as well as the members of the Compensation Committee are elected by the shareholders at the general meeting of shareholders for a term of office extending until completion of the next ordinary general meeting of shareholders. Members whose terms of office have expired shall be immediately eligible for re-election. ABB's Articles of Incorporation (available at <https://new.abb.com/about/corporate-governance>) do not provide for the retirement of directors based on their age. However, an age limit for members of the Board is set forth in the ABB Ltd Board Governance Rules (available at <https://new.abb.com/about/corporate-governance>), although waivers are possible and subject to Board discretion. If the office of the Chairman of the Board of Directors or any position on the Compensation Committee becomes vacant during a Board term, the Board of Directors may appoint (shall appoint in the case of the Chairman of the Board) another individual from among its members to that position for the remainder of that term. The Board of Directors shall consist of no less than 7 and no more than 13 members.

Members of the Board (2022-2023 Board term)

Board Member	Board Experience		Corporate Officer Experience		Other Business Experience				Global Experience	Country of Origin / Nationality	Gender	Non-Executive	Independent
	ABB Board Tenure (years)	Other Public Board Experience	CEO	CFO	Operations	Risk Management	Sustainability	Digital / Technology					
Peter R. Voser	8	•	•	•	•	•	•	•	•	CH	M	Yes	Yes
Jacob Wallenberg	24	•	•		•	•	•	•	•	SE	M	Yes	Yes
Gunnar Brock	5	•	•		•	•	•		•	SE	M	Yes	Yes
David Constable	8	•	•		•	•	•		•	CA, US	M	Yes	Yes
Frederico Fleury Curado	7	•	•		•	•	•	•	•	BR, PT	M	Yes	Yes
Lars Förberg	6	•	•			•	•		•	SE, CH	M	Yes	Yes
Jennifer Xin-Zhe Li	5	•		•	•	•	•	•	•	CN, CA	F	Yes	Yes
Geraldine Matchett	5		•	•		•	•		•	CH, UK, FR	F	Yes	Yes
David Meline	7	•		•		•			•	US, CH	M	Yes	Yes
Satish Pai	7	•	•		•	•	•	•	•	IN	M	Yes	Yes

Peter R. Voser has been a member and Chairman of ABB's Board of Directors since April 2015. He was also ABB's Chief Executive Officer from April 2019 to February 2020. He is a member of the board of directors of IBM Corporation (U.S.). He is also a member of the board of directors of Temasek Holdings (Private) Limited (Singapore) as well as chairman of the board of PSA International Pte Ltd (Singapore), one of its subsidiaries. In addition, he is the chairman of the board of trustees of the St. Gallen Foundation for International Studies. He was previously the chief executive officer of Royal Dutch Shell plc (The Netherlands). Mr. Voser was born in 1958 and is a Swiss citizen.

Jacob Wallenberg has been a member of ABB's Board of Directors since June 1999 and Vice-Chairman since April 2015. He is the chairman of the board of Investor AB (Sweden). He is vice-chairman of the boards of Telefonaktiebolaget LM Ericsson, FAM AB and Patricia Industries (all Sweden). He is also a member of the board of directors of the Knut and Alice Wallenberg Foundation as well as a member of the nomination committee of SAS AB (both Sweden). Through June 2022, he was a member of the board of directors of Nasdaq, Inc. (U.S.). Mr. Wallenberg was born in 1956 and is a Swedish citizen.

Gunnar Brock has been a member of ABB's Board of Directors since March 2018. He is chairman of the boards of directors of Neptunia Invest AB and Stena AB (both Sweden) and a member of the boards of directors of Investor AB and Patricia Industries (both Sweden). Through July 2022, he was the chairman of the board of directors of Mölnlycke Health Care AB (Sweden). He was formerly president and chief executive officer of Atlas Copco AB (Sweden). Mr. Brock was born in 1950 and is a Swedish citizen.

David Constable has been a member of ABB's Board of Directors since April 2015. He is the chairman of the board of directors and chief executive officer of Fluor Corporation (U.S.). He was formerly the chief executive officer and president as well as a member of the board of directors of Sasol Limited (South Africa). He joined Sasol after more than 29 years with Fluor Corporation (U.S.). Mr. Constable was born in 1961 and is a Canadian and U.S. citizen.

Frederico Fleury Curado has been a member of ABB's Board of Directors since April 2016. He is a member of the boards of directors of Ultrapar S.A. (Brazil), Transocean Ltd. (Switzerland) and LATAM Airlines Group S.A. (Chile). He was formerly the chief executive officer of Ultrapar S.A. and Embraer S.A. (both Brazil). Mr. Curado was born in 1961 and is a Brazilian and Portuguese citizen.

Lars Förberg has been a member of ABB's Board of Directors since April 2017. He is co-founder and managing partner of Cevian Capital. Mr. Förberg was born in 1965 and is a Swedish and Swiss citizen.

Jennifer Xin-Zhe Li has been a member of ABB's Board of Directors since March 2018. She is a member of the boards of directors of SAP SE (Germany), Kone Oy (Finland) and Full Truck Alliance Co. Ltd. (Cayman Islands/P.R.C.). Through August 2022, she was a member of the board of directors of Flex Ltd (Singapore/U.S.). Ms. Li is a founder and general partner of Changcheng Investment Partners (P.R.C.), a private investment fund. From 2008 to 2018, she served as chief financial officer of Baidu Inc. (P.R.C.) and chief executive officer of Baidu Capital (P.R.C.). Prior to that, Ms. Li spent 14 years with General Motors, holding various senior finance positions, including chief financial officer of GM China and corporate controller for GMAC North American Operations. Ms. Li was born in 1967 and is a Canadian citizen.

Geraldine Matchett has been a member of ABB's Board of Directors since March 2018. She is the co-chief executive officer, the chief financial officer and a member of the managing board of Royal DSM N.V. (The Netherlands). She was previously the chief financial officer of SGS Ltd (Switzerland). Prior to joining SGS she worked as an auditor at Deloitte Ltd (Switzerland) and KPMG LLP (U.K.). Ms. Matchett was born in 1972 and is a Swiss, British and French citizen.

David Meline has been a member of ABB's Board of Directors since April 2016. From 2011 through 2022, he held chief financial officer roles at Moderna Inc. (U.S.), Amgen Inc. (U.S.) and the 3M Company (U.S.). From 2008 through 2011 he was the corporate controller and chief accounting officer of the 3M Company (U.S.). Prior to joining 3M, Mr. Meline worked for more than 20 years for General Motors Company (U.S.). Mr. Meline was born in 1957 and is a U.S. and Swiss citizen.

Satish Pai has been a member of ABB's Board of Directors since April 2016. He is the managing director and a member of the board of directors of Hindalco Industries Ltd. (India). He joined Hindalco in 2013 after 28 years with Schlumberger Limited (U.S.). Mr. Pai was born in 1961 and is an Indian citizen.

As of December 31, 2022, none of the Board members held any official functions or political posts. Further information on ABB's Board members can be found on ABB's website under the ABB Board of Directors link (available at <https://new.abb.com/about/corporate-governance>).

Board meetings and attendance

The Board and its committees have regularly scheduled meetings throughout the year. These meetings are supplemented by additional meetings (either in person or by conference call), as necessary. Board meetings are convened by the Chairman or upon request by any other Board member or the CEO. Documentation covering the various items of the agenda for each Board meeting is sent out in advance to each Board member in order to allow each member time to study the covered matters prior to the meetings. Each Board meeting has a private session without management or others being present. Decisions made at the Board meetings are recorded in written minutes of the meetings. Some decisions are also taken by circular resolution.

The table below shows the number of meetings held during 2022 by the Board and its committees, their average duration, as well as the attendance of the individual Board members. The Board meetings shown include a strategic retreat attended by the members of the Board and the EC.

2022 Board and Board Committee Meetings

Meetings and attendance	Pre annual general meeting 2022					Post annual general meeting 2022				
	Board					Board				
	Mtg.	Conf. Call	FACC	GNC	CC	Mtg.	Conf. Call	FACC	GNC	CC
Average duration (hours)	7.5	1.5	2	1.25	1.25	8.25	1.5	3	1	1.25
Number of meetings	1	1	2	2	2	4	2	5	4	5
Meetings attended:										
Peter R. Voser	1	1		2		4	2		4	
Jacob Wallenberg	1	1		2		4	2		3	
Gunnar Brock	1	1	2			4	2	5		
David Constable		1			2	4	1			5
Frederico Fleury Curado	1	1			2	4	2			5
Lars Förberg	1	1		2		4	2		4	
Jennifer Xin-Zhe Li	1	1		2	2	4	1		4	5
Geraldine Matchett		1	1			4	2	5		
David Meline	1	1	2			4	2	5		
Satish Pai	1	1	2			4	2	5		

Mandates of Board members outside the ABB Group

No member of the Board may hold more than ten additional mandates, of which no more than four may be in listed companies. Certain types of mandates, such as those in our subsidiaries, those in the same group of companies and those in non-profit and charitable institutions, are not subject to those limits. Additional details can be found in Article 38 of ABB's Articles of Incorporation (available at <https://new.abb.com/about/corporate-governance>).

Business relationships between ABB and its Board members

This section describes important business relationships between ABB and its Board members, or companies and organizations represented by them.

Fluor Corporation (Fluor) is an important customer of ABB. ABB sells primarily electrical switchgears, control systems and electrical solutions through its Electrification and Process Automation Business Areas to Fluor. David Constable is the chairman of the board of directors and CEO of Fluor.

After reviewing the level of business with Fluor, the Board has determined that ABB's business relationship with Fluor is not unusual in its nature or conditions and does not constitute a material business relationship. As a result, the Board concluded that all members of the Board are independent.

These determinations were made in accordance with ABB Ltd's Related Party Transaction Policy, which was prepared based on the Swiss Code of Best Practice for Corporate Governance and the independence criteria set forth in the corporate governance rules of the New York Stock Exchange. This policy is contained in the ABB Ltd Board Governance Rules (available at <https://new.abb.com/about/corporate-governance>).

Information and control systems of the Board vis-à-vis the Executive Committee

Information from the Executive Committee

In accordance with the ABB Board Governance Rules (available at <https://new.abb.com/about/corporate-governance>), the CEO reports regularly to the Board about ABB's overall business and when circumstances require on any extraordinary events that may arise. This includes:

- Reports on financial results (including profit and loss, balance sheet and cash flows);
- Changes in key members of management;
- Information that may affect the supervisory or monitoring function of the Board (including on matters of strategy and compliance); and
- Significant developments in legal matters.

At each Board meeting, Board members are briefed by the Chairman, CEO, CFO and other EC members on ABB's business performance and on material developments affecting ABB. Outside of Board meetings, Board members generally channel any requests for information through the Chairman. Board members also obtain information through offsite retreats with the Executive Committee and visits to ABB sites. In addition, Board members obtain information through the Board committees in which they participate and which are also attended by relevant EC members and management representatives from human resources, finance, legal and the business.

Internal Audit

ABB has an Internal Audit team that provides independent objective assurance and other services to help ensure that ABB operates in accordance with applicable laws as well as internal policies and procedures. Internal Audit reports to the FACC and to the CFO. The FACC reviews and approves the internal audit plan, and material changes to the plan. Investigations of potential fraud and inappropriate business conduct are an integral part of the internal audit process. Depending on circumstances, Internal Audit may act together with ABB's Integrity Investigations and Monitoring department, which is part of ABB's integrity function. Internal Audit reports on a regular basis its main observations and recommendations to the relevant members of the EC and to the FACC as appropriate.

Risk Management

ABB has an enterprise risk management program (ERM) in place which takes into account ABB's size and complexity. ERM provides the EC and the Board with a comprehensive and holistic view of the risks facing the business. ERM involves managing the acceptance of risk to achieve the objectives of the business. The ERM process is typically cyclical in nature, conveying the idea of continuous refinement of the risk management approach in a dynamic business environment. Furthermore, ABB runs a mitigation process for the identified risks that is key to the success of this process. ERM assessments are both top down and bottom up. They cover strategic, financial, and operational risks, both current and long term. Key risks identified and managed in 2022 were those related to the war in Ukraine, to continued constraints in global supply chains and to the planned initial public offering in Switzerland of ABB's electric-vehicle charging business. ERM results are reported to the FACC and the entire Board. This information becomes part of the overall strategic and risk discussions by the Board to help create value for stakeholders.

Information to the Board and the Finance, Audit and Compliance Committee

Supervisory and control instruments vis-à-vis the auditors

Our auditors, KPMG, attend each meeting of the FACC and each meeting includes a private session between the auditors and the FACC without management being present. In 2022, the FACC had 7 meetings (either in person or via telephone call). On at least an annual basis, the FACC reviews and discusses with the external auditors all significant relationships that the auditors have with the Company that could impair their independence. The FACC reviews the auditor engagement letter and the audit plan including discussion of scope, staffing, locations and general audit approach. The FACC also reviews and evaluates the auditors' judgment on the quality and appropriateness of the Company's accounting principles as applied in the financial reporting. In addition, the FACC approves in advance any non-audit services to be performed by the auditors.

At least annually, the FACC obtains and reviews a report by the auditors that includes discussion on:

- The Company's internal control procedures;
- Material issues, if any, raised by the most recent internal quality control review;
- Critical accounting policies and practices of the Company;
- All alternative accounting treatments of financial information that were discussed between the auditors and management as well as the related ramifications; and
- Material communications between the auditors and management such as any management letter or schedule of audit differences.

Taking into account the opinions of management the FACC evaluates the qualifications, independence and performance of the auditors. The FACC reports the material elements of its supervision of the auditors to the Board and on an annual basis recommends to the Board the auditors to be proposed for election at the shareholders meeting.

Executive Committee

Composition of the Executive Committee (at December 31, 2022)

Björn Rosengren Chief Executive Officer	
CORPORATE OFFICERS	BUSINESS AREA PRESIDENTS
Timo Ihamuotila Chief Financial Officer	Morten Wierod Electrification
Carolina Granat Chief Human Resources Officer	Peter Terwiesch Process Automation
Andrea Antonelli General Counsel	Tarak Mehta Motion
Karin Lepasoon Chief Communications and Sustainability Officer	Sami Atiya Robotics & Discrete Automation

Executive Committee responsibilities and organization

The Board has delegated the executive management of ABB to the CEO. The CEO and, under his direction, the other members of the Executive Committee are responsible for ABB's overall business and affairs and day-to-day management. The CEO reports to the Board regularly, and whenever extraordinary circumstances so require, on the course of ABB's business and financial performance and on all organizational and personnel matters, transactions and other issues material to the Group. Each member of the Executive Committee is appointed and discharged by the Board.

Members of the Executive Committee (at December 31, 2022):

Björn Rosengren was appointed Chief Executive Officer and member of the Executive Committee effective March 2020. He is a member of the board of directors of the World Childhood Foundation (Sweden). Before joining ABB, he was the president and chief executive officer of Sandvik AB (Sweden) since 2015. Prior to that, Mr. Rosengren was the chief executive officer of Wärtsilä Corporation (Finland) from 2011 to 2015. He held a variety of management roles at Atlas Copco AB (Sweden) from 1998 to 2011. Mr. Rosengren was born in 1959 and is a Swedish citizen.

Timo Ihamuotila was appointed Chief Financial Officer and member of the Executive Committee effective April 2017. He is a member of the board of directors of SoftwareONE Holding AG and Hitachi Energy Ltd (both Switzerland). From 2009 to 2016, Mr. Ihamuotila was chief financial officer and an executive vice president of the Nokia Corporation (Finland). From 1999 to 2009, he held various senior roles with Nokia. Mr. Ihamuotila was born in 1966 and is a Finnish citizen.

Carolina Granat was appointed Chief Human Resources Officer and member of the Executive Committee effective January 2021. She joined ABB in 2020 as Head of People Development. Prior to that, she was globally responsible for human resources at the machining solutions business area of Sandvik AB (Sweden). Ms. Granat was born in 1972 and is a Swedish citizen.

Andrea Antonelli was appointed General Counsel and member of the Executive Committee effective March 2022. From 2020 to 2022 he was General Counsel of both ABB's Electrification and Robotics & Discrete Automation Business Areas. Prior to joining ABB, Mr. Antonelli was at the Tetra Pak Group, where he held various positions as regional general counsel for different regions as well as vice president legal affairs of global commercial operations. He has also worked for General Electric and Fluor Corporation, as well as in private practice at DLA Piper London offices. Mr. Antonelli was born in 1974 and is an Italian citizen.

Karin Lepasoon was appointed Chief Communications and Sustainability Officer and member of the Executive Committee effective October 2022. She joined ABB from Vattenfall, where she served as head of group communications and public & regulatory affairs and member of the company's group executive management team. Prior to that, Ms. Lepasoon also served as head of global marketing and communications at SEB, director of sustainability, communications and HR at Nordic Capital, head of strategy and chief of staff at Skanska, and held various other roles in the area of communications. Ms. Lepasoon was born in 1968 and is a Swedish citizen.

Morten Wierod was appointed President of the Electrification Business Area effective April 2022 and has been a member of the Executive Committee since April 2019, when he was appointed President of the Motion Business Area. From 2015 until April 2019, he was the Managing Director of the drives business unit in the Robotics and Motion division. During 2011 to 2015, Mr. Wierod was the Managing Director of the control products business unit in the Low Voltage Products division. Between 1998 to 2011, he held various management roles with ABB. Mr. Wierod was born in 1972 and is a Norwegian citizen.

Peter Terwiesch was appointed President of the Process Automation Business Area and member of the Executive Committee effective January 2015 (Process Automation known as Industrial Automation from 2017 until 2020). He is a member of the board of directors of Hilti AG (Liechtenstein). From 2011 to 2014, Mr. Terwiesch was Head of ABB's Central Europe region. He was ABB's Chief Technology Officer from 2005 to 2011. From 1994 to 2005, he held several positions with ABB. Mr. Terwiesch was born in 1966 and is a German and Swiss citizen.

Tarak Mehta was appointed President of the Motion Business Area effective April 2022 and has been a member of the Executive Committee since October 2010. He is a member of the board of directors of Prysmian S.p.A. (Italy). He was President of the Electrification Business Area since April 2019 and President of the Electrification Products division from 2016 to 2019. From October 2010 through December 2015, he was President of the Low Voltage Products division. From 2007 to 2010, he was Head of ABB's transformers business. Between 1998 and 2006, he held several management positions with ABB. Mr. Mehta was born in 1966 and is a U.S. and Swiss citizen.

Sami Atiya was appointed President of the Robotics & Discrete Automation Business Area effective April 2019 and has been a member of the Executive Committee since June 2016. He is a member of the board of directors of SGS SA (Switzerland). He had previously been President of the Robotics and Motion division since January 2017. From June to December 2016 he was President of the Discrete Automation and Motion division. Prior to joining ABB, Mr. Atiya held senior roles at Siemens in Germany from 1997 to 2015, including as chief executive officer of the mobility and logistics division in the infrastructure and cities sector from 2011. Mr. Atiya was born in 1964 and is a German citizen.

Further information about the members of the Executive Committee can be found on ABB's website under the Executive Committee link (available at <https://new.abb.com/about/corporate-governance>).

Mandates of EC members outside the ABB Group

No member of the EC may hold more than five additional mandates, of which no more than one may be in a listed company. Certain types of mandates, such as those in our subsidiaries, those in the same group of companies and those in non-profit and charitable institutions, are not subject to those limits. Additional details can be found in Article 38 of ABB's Articles of Incorporation (available at <https://new.abb.com/about/corporate-governance>).

Business relationships between ABB and its EC members

This section describes important business relationships between ABB and its EC members, or companies and organizations represented by them.

Until December 28, 2022, ABB had a minority stake in Hitachi Energy Ltd (Hitachi Energy), the holding company of ABB's former power grids business. Hitachi Energy is both an important supplier to and customer of ABB. Timo Ihamuotila is a director of Hitachi Energy.

After reviewing the level of business with Hitachi Energy, the Board has determined that ABB's business relationship with Hitachi Energy is not unusual in its nature or conditions.

These determinations were made in accordance with ABB Ltd's Related Party Transaction Policy, which was prepared based on the Swiss Code of Best Practice for Corporate Governance and the independence criteria set forth in the corporate governance rules of the New York Stock Exchange. This policy is contained in the ABB Ltd Board Governance Rules (available at <https://new.abb.com/about/corporate-governance>).

Shares

Share capital of ABB

At December 31, 2022, ABB's ordinary share capital (including treasury shares) as registered with the commercial register amounted to CHF 235,769,409.00, divided into 1,964,745,075 fully paid registered shares with a par value of CHF 0.12 per share.

ABB Ltd's shares are listed on the SIX Swiss Exchange, the NASDAQ OMX Stockholm Exchange and the New York Stock Exchange (where its shares are traded in the form of American depositary shares (ADS) – each ADS representing one registered ABB share). At December 31, 2022, ABB Ltd had a market capitalization based on outstanding shares (total number of outstanding shares: 1,865,003,331) of approximately CHF 52 billion (\$57 billion, SEK 590 billion). The only consolidated subsidiary in the ABB Group with listed shares is ABB India Limited, Bangalore, India, which is listed on the BSE Ltd. (Bombay Stock Exchange) and the National Stock Exchange of India. At December 31, 2022, ABB Ltd, Switzerland, directly or indirectly owned 75 percent of ABB India Limited, Bangalore, India, which at that time had a market capitalization of approximately INR 569 billion.

Stock exchange listings (at December 31, 2022)

Stock exchange	Security	Ticker symbol	ISIN code
SIX Swiss Exchange	ABB Ltd, Zurich, share	ABBN	CH0012221716
SIX Swiss Exchange	ABB Ltd, Zurich, share buyback (second trading line)	ABBNE	CH0357679619
NASDAQ OMX Stockholm Exchange	ABB Ltd, Zurich, share	ABB	CH0012221716
New York Stock Exchange	ABB Ltd, Zurich, ADS	ABB	US0003752047
BSE Ltd. (Bombay Stock Exchange)	ABB India Limited, Bangalore, share	ABB ⁽¹⁾	INE117A01022
National Stock Exchange of India	ABB India Limited, Bangalore, share	ABB	INE117A01022

(1) Also called Scrip ID.

Share repurchases and cancellation

At ABB's Annual General Meeting 2022, shareholders approved the proposal to cancel 88,403,189 shares repurchased under ABB's 2020/21 and 2021/22 share buyback programs. These shares were cancelled in June 2022, resulting in a reduced total number of issued ABB Ltd shares of 1,964,745,075. 15,283,500 shares repurchased under ABB's 2021/22 share buyback program are remaining for cancellation.

In April 2022, ABB launched a follow-up share buyback program of up to \$3 billion. The main purpose of this program was to complete the return of \$7.8 billion cash proceeds from the Power Grids divestment to shareholders. Under that share buyback program, ABB repurchased a total of 59,956,000 shares as per December 31, 2022, and a total of 64,615,000 shares as per February 15, 2023.

ABB intends to use the capital band, which it will propose at the Annual General Meeting 2023 to its shareholders for introduction (see “Authorized share capital” below), for cancellation of shares repurchased under the share buyback programs 2021/22 and 2022/23.

Further information on ABB's share buyback programs can be found at <https://global.abb/group/en/investors/investor-and-shareholder-resources/share-buybacks>.

In addition, ABB repurchased a total of 20,000,000 shares as per December 31, 2022, primarily for use in connection with employee share programs. Further information can be found at <https://www.abb.com/investorrelations>.

Changes to the ordinary share capital

Except for the share cancellations described above and in ABB's Annual Report 2021 on Form 20-F, there were no other changes to ABB's ordinary share capital during 2022, 2021 and 2020.

Convertible bonds and options

ABB does not have any bonds outstanding that are convertible into ABB shares. For information about options on shares issued by ABB, please refer to “Note 19 – Stockholders' equity” to ABB's Consolidated Financial Statements.

Contingent share capital

At December 31, 2022, ABB's share capital may be increased by an amount not to exceed CHF 24,000,000 through the issuance of up to 200,000,000 fully paid registered shares with a par value of CHF 0.12 per share through the exercise of conversion rights and/or warrants granted in connection with the issuance on national or international capital markets of newly or already issued bonds or other financial market instruments. If this contingent share capital were fully issued this would increase the existing share capital by approximately 10.2 percent. The contingent share capital has not changed during the last three years.

At December 31, 2022, ABB's share capital may be increased by an amount not to exceed CHF 1,200,000 through the issuance of up to 10,000,000 fully paid registered shares with a par value of CHF 0.12 per share through the exercise of warrant rights granted to its shareholders. If this contingent share capital were fully issued this would increase the existing share capital by approximately 0.5 percent. This contingent share capital has not changed during the last three years. The Board may grant warrant rights not taken up by shareholders for other purposes in the interest of ABB.

The pre-emptive rights of the shareholders are excluded in connection with the issuance of convertible or warrant-bearing bonds or other financial market instruments or the grant of warrant rights. The then current owners of conversion rights and/or warrants will be entitled to subscribe for new shares. The conditions of the conversion rights and/or warrants will be determined by the Board.

The acquisition of shares through the exercise of warrants and each subsequent transfer of the shares will be subject to the restrictions of ABB's Articles of Incorporation (see “Limitations on transferability of shares and nominee registration” in the Shareholders section below) (available at <https://new.abb.com/about/corporate-governance>).

In connection with the issuance of convertible or warrant-bearing bonds or other financial market instruments, the Board is authorized to restrict or deny the advance subscription rights of shareholders if such bonds or other financial market instruments are for the purpose of financing or refinancing the acquisition of an enterprise, parts of an enterprise, participations or new investments or an issuance on national or international capital markets. If the Board denies advance subscription rights, the convertible or warrant-bearing bonds or other financial market instruments will be issued at the relevant market conditions and the new shares will be issued pursuant to the relevant market conditions taking into account the share price and/or other comparable instruments having a market price. Conversion rights may be exercised during a maximum ten-year period, and warrants may be exercised during a maximum seven-year period, in each case from the date of the respective issuance. The advance subscription rights of the shareholders may be granted indirectly.

At December 31, 2022, ABB's share capital may be increased by an amount not to exceed CHF 11,284,656 through the issuance of up to 94,038,800 fully paid shares with a par value of CHF 0.12 per share to employees. If this contingent share capital were fully issued this would increase the existing share capital by approximately 4.8 percent. This contingent share capital has not changed during the last three years. The pre-emptive and advance subscription rights of ABB's shareholders are excluded. The shares or rights to subscribe for shares will be issued to employees pursuant to one or more regulations to be issued by the Board, taking into account performance, functions, level of responsibility and profitability criteria. ABB may issue shares or subscription rights to employees at a price lower than that quoted on a stock exchange. The acquisition of shares within the context of employee share ownership and each subsequent transfer of the shares will be subject to the restrictions of ABB's Articles of Incorporation (see "Limitations on transferability of shares and nominee registration" in the Shareholders section below).

Authorized share capital

At December 31, 2022, ABB had an authorized share capital in the amount of up to CHF 24,000,000 through the issuance of up to 200,000,000 fully paid registered shares with a par value of CHF 0.12 each, which is valid through March 25, 2023. If the authorized share capital were fully issued, this would increase the existing share capital by approximately 10.2 percent. Aside from renewal at the 2021 AGM, the authorized share capital has not changed during the last three years. The Board is authorized to determine the date of issue of new shares, the issue price, the type of payment, the conditions for the exercise of pre-emptive rights and the beginning date for dividend entitlement. In this regard, the Board may issue new shares by means of a firm underwriting through a banking institution, a syndicate or another third party with a subsequent offer of these shares to the shareholders. The Board may permit pre-emptive rights that have not been exercised by shareholders to expire or it may place these rights and/or shares as to which pre-emptive rights have been granted but not exercised at market conditions or use them for other purposes in the interest of the Company. Furthermore, the Board is authorized to restrict or deny the pre-emptive rights of shareholders and allocate such rights to third parties if the shares are used (1) for the acquisition of an enterprise, parts of an enterprise, or participations, or for new investments, or in case of a share placement, for the financing or refinancing of such transactions; or (2) for the purpose of broadening the shareholder constituency in connection with a listing of shares on domestic or foreign stock exchanges. The subscription and the acquisition of the new shares, as well as each subsequent transfer of the shares, will be subject to the restrictions of ABB's Articles of Incorporation (available at <https://new.abb.com/about/corporate-governance>).

In line with the revised provisions of the Swiss Code of Obligations effective since January 1, 2023, ABB will propose to the Annual General Meeting 2023 to replace the then expiring authorized share capital with a capital band ranging from CHF 212,192,469 (lower limit) to CHF 259,346,349 (upper limit), i.e. from 90 percent to 110 percent of the share capital currently entered in the commercial register. Within this capital band, the Board of Directors shall be 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. ABB intends to use the capital band for cancellation of shares repurchased under the share buyback programs 2021/22 and 2022/23 (see "Share repurchases and cancellation" above).

Shareholders

Shareholder structure

At December 31, 2022, the total number of shareholders directly registered with ABB Ltd was approximately 90,000 and another 549,000 shareholders held shares indirectly through nominees. In total, as of that date, ABB had approximately 639,000 shareholders.

Significant shareholders

Under the Swiss Financial Market Infrastructure Act, shareholders and groups of shareholders acting in concert who directly or indirectly acquire or sell shares of a listed Swiss corporation or rights based thereon and thereby reach, exceed or fall below the thresholds of 3 percent, 5 percent, 10 percent, 15 percent, 20 percent, 25 percent, 33¹/₃ percent, 50 percent or 66²/₃ percent of the voting rights of the corporation must notify the corporation and the SIX Swiss Exchange of such holdings. Based on the disclosure notifications made to ABB and the SIX Swiss Exchange, the following shareholders hold or control voting rights of 3 percent or more of ABB Ltd's issued shares. Except where indicated otherwise, the shareholdings described below are based on the notices provided to ABB and the SIX Swiss Exchange and do not reflect any subsequent changes in shareholdings and share capital and votes.

Investor AB, Sweden, disclosed to ABB and the SIX Swiss Exchange that as per November 9, 2015, it owned 232,165,142 ABB Ltd shares and controlled 10.03 percent of the voting rights in ABB Ltd. In its latest quarterly financial report, Investor AB, Sweden, disclosed that as per December 31, 2022, it owned 265,385,142 ABB Ltd shares and controlled 13.5 percent of the voting rights in ABB Ltd. The number of shares held by Investor AB does not include shares held by Mr. Jacob Wallenberg, the chairman of Investor AB and a director of ABB, in his individual capacity.

BlackRock, Inc., U.S.A., disclosed to ABB and the SIX Swiss Exchange that as per November 16, 2022, it owned 80,226,133 ABB Ltd shares and controlled 4.97 percent of the voting rights in ABB Ltd.

Cevian Capital II GP Limited, Jersey, disclosed to ABB and the SIX Swiss Exchange that as per July 30, 2020, it owned 107,344,554 ABB Ltd shares and controlled 4.95 percent of the voting rights in ABB Ltd.

The Capital Group Companies, Inc., USA, disclosed to ABB and the SIX Swiss Exchange that as per July 1, 2022, it owned 69,725,960 ABB Ltd shares and controlled 4.02 percent of the voting rights in ABB Ltd.

At December 31, 2022, to the best of ABB's knowledge, no other shareholder held 3 percent or more of ABB's total share capital and voting rights as registered in the commercial register on that date.

ABB Ltd has no cross shareholdings in excess of 5 percent of capital, or voting rights with any other company.

Announcements related to disclosure notifications made by shareholders during 2022 can be found via the search facility on the platform of the Disclosure Office of the SIX Swiss Exchange: <https://www.ser-ag.com/en/resources/notifications-market-participants/significant-shareholders.html#/>.

Under ABB's Articles of Incorporation (available at <https://new.abb.com/about/corporate-governance>), each registered share represents one vote. Significant shareholders do not have different voting rights. To our knowledge, we are not directly or indirectly owned or controlled by any government or by any other corporation or person.

Shareholders' rights

Shareholders have the right to receive dividends, to vote and to execute such other rights as granted under Swiss law and the Articles of Incorporation (available at <https://new.abb.com/about/corporate-governance>).

Right to vote

ABB has one class of shares and each registered share carries one vote at the general meeting. Voting rights may be exercised only after a shareholder has been registered in the share register of ABB as a shareholder with the right to vote, or with Euroclear Sweden AB (Euroclear), which maintains a subregister of the share register of ABB.

A shareholder may be represented at the Annual General Meeting by its legal representative, by another shareholder with the right to vote or by the independent proxy elected by the shareholders (unabhängiger Stimmrechtsvertreter). If the Company does not have an independent proxy, the Board of Directors shall appoint the independent proxy for the next General Meeting of Shareholders. All shares held by one shareholder may be represented by one representative only.

For practical reasons shareholders must be registered in the share register no later than 6 business days before the general meeting in order to be entitled to vote. Except for the cases described under “Limitations on transferability of shares and nominee registration” below, there are no voting rights restrictions limiting ABB’s shareholders’ rights.

Annual General Meeting/Extraordinary General Meeting/COVID-19

ABB’s top priority is protecting the health of its shareholders and employees. Therefore, due to the extraordinary circumstances and in accordance with applicable Swiss COVID-19 legislation, shareholders were not able to attend ABB’s Annual General Meeting 2022 in person, but could exercise their shareholder rights via the independent proxy only. In addition, ABB offered shareholders the opportunity to address questions on agenda items to the Board of Directors in writing ahead of the meeting. Thanks to the improved COVID-19 situation, ABB was able to hold an Extraordinary General Meeting in September 2022 with shareholders present in person.

Shareholders’ dividend rights

The unconsolidated statutory financial statements of ABB Ltd are prepared in accordance with Swiss law. Based on these financial statements, dividends may be paid only if ABB Ltd has sufficient distributable profits from previous years or sufficient free reserves to allow the distribution of a dividend. Swiss law requires that ABB Ltd retain at least 5 percent of its annual net profits as legal reserves until these reserves amount to at least 20 percent of ABB Ltd’s share capital. Any net profits remaining in excess of those reserves are at the disposal of the shareholders’ meeting.

Under Swiss law, ABB Ltd may only pay out a dividend if it has been proposed by a shareholder or the Board of Directors and approved at a general meeting of shareholders, and the auditors confirm that the dividend conforms to statutory law and ABB’s Articles of Incorporation. In practice, the shareholders’ meeting usually approves dividends as proposed by the Board of Directors.

Dividends are usually due and payable no earlier than 2 trading days after the shareholders’ resolution and the ex-date for dividends is normally 2 trading days after the shareholders’ resolution approving the dividend. Dividends are paid out to the holders that are registered on the record date. Euroclear administers the payment of those shares registered with it. Under Swiss law, dividends not collected within 5 years after the due date accrue to ABB Ltd and are allocated to its other reserves. As ABB Ltd pays cash dividends, if any, in Swiss francs (subject to the exception for certain shareholders in Sweden described below), exchange rate fluctuations will affect the U.S. dollar amounts received by holders of ADSs upon conversion of those cash dividends by Citibank, N.A., the depositary, in accordance with the Amended and Restated Deposit Agreement dated May 7, 2001.

For shareholders who are residents of Sweden, ABB has established a dividend access facility (for up to 600,004,716 shares). With respect to any annual dividend payment for which this facility is made available, shareholders who register with Euroclear may elect to receive the dividend from ABB Norden Holding AB in Swedish krona (in an amount equivalent to the dividend paid in Swiss francs) without deduction of Swiss withholding tax. For further information on the dividend access facility, see ABB’s Articles of Incorporation.

Limitations on transferability of shares and nominee registration

ABB may decline a registration with voting rights if a shareholder does not declare that it has acquired the shares in its own name and for its own account. If the shareholder refuses to make such declaration, it will be registered as a shareholder without voting rights. A person failing to expressly declare in its registration/application that it holds the shares for its own account (a nominee), will be entered in the share register with voting rights, provided that such nominee has entered into an agreement with ABB concerning its status, and further provided that the nominee is subject to recognized bank or financial market supervision. In special cases, the Board may grant exemptions. There were no exemptions granted in 2022. The limitation on the transferability of shares may be removed by an amendment of ABB's Articles of Incorporation by a shareholders' resolution requiring two-thirds of the votes represented at the meeting.

No restriction on trading of shares

No restrictions are imposed on the transferability of ABB shares. The registration of shareholders in the ABB share register, Euroclear and the ADS register kept by Citibank does not affect transferability of ABB shares or ADSs. Registered ABB shareholders or ADR holders may therefore purchase or sell their ABB shares or ADRs at any time, including before a General Meeting regardless of the record date. The record date serves only to determine the right to vote at a General Meeting.

Duty to make a public tender offer

ABB's Articles of Incorporation do not contain any provisions raising the threshold (opting up) or waiving the duty (opting out) to make a public tender offer pursuant to Article 135 of the Swiss Act on Financial Market Infrastructures and Market Conduct in Securities and Derivatives Trading.

Other governance information

ABB Group organizational structure

ABB Ltd, Switzerland, is the ultimate parent company of the ABB Group. It is the sole shareholder of ABB Asea Brown Boveri Ltd which directly or indirectly owns the other companies in the ABB Group. "Item 4. Information on the Company—Organizational structure" sets forth, as of December 31, 2022, the name, place of incorporation and ownership interest of the significant direct and indirect subsidiaries of ABB Ltd. In addition, ABB Ltd also owned 19.9 percent of Hitachi Energy Ltd until December 28, 2022. ABB's operational group structure is described in ABB's Financial Report 2022.

Management contracts

There are no management contracts between ABB and companies or natural persons not belonging to the ABB Group.

Change of control clauses

Board members, Executive Committee members, and other members of senior management do not receive any special benefits in the event of a change of control. However, the conditional grants under the Long-Term Incentive Plan (LTIP) and the Management Incentive Plan (MIP) may be subject to accelerated vesting in the event of a change of control. From 2021, the rules for the LTIP have been amended to no longer provide for accelerated vesting upon a change in control. No further grants are made under the MIP.

Employee participation programs

In order to align its employees' interests with the business goals and financial results of the Company, ABB operates a number of incentive plans, linked to ABB's shares, such as the Employee Share Acquisition Plan, the MIP and the LTIP. For a more detailed description of these incentive plans, please refer to "Note 18 – Share-based payment arrangements" to ABB's Consolidated Financial Statements.

General blackout periods for trading ABB securities

During the 30 days prior to the day of publication of the ABB Group's quarterly financial results, as well as on such day, the members of the Board of Directors and the Executive Committee as well as certain employees of ABB, as specified in ABB's internal policies, are prohibited from trading in ABB Ltd securities and any related financial instruments.

Governance differences from NYSE Standards

According to the New York Stock Exchange's corporate governance standards (the Standards), ABB is required to disclose significant ways in which its corporate governance practices differ from the Standards. ABB has reviewed the Standards and concluded that its corporate governance practices are generally consistent with the Standards, with the following significant exceptions:

- Swiss law requires that the external auditors be elected by the shareholders at the Annual General Meeting rather than by the audit committee or the board of directors.
- The Standards require that all equity compensation plans and material revisions thereto be approved by the shareholders. Consistent with Swiss law such matters are decided by our Board. However, the shareholders decide about the creation of new share capital that can be used in connection with equity compensation plans.
- Swiss law requires that the members of the compensation committee are elected by the shareholders rather than appointed by our Board.
- Swiss law requires shareholders to approve the maximum aggregate Board compensation and the maximum aggregate Executive Committee compensation.

Compensation

Compensation at a glance

Board compensation

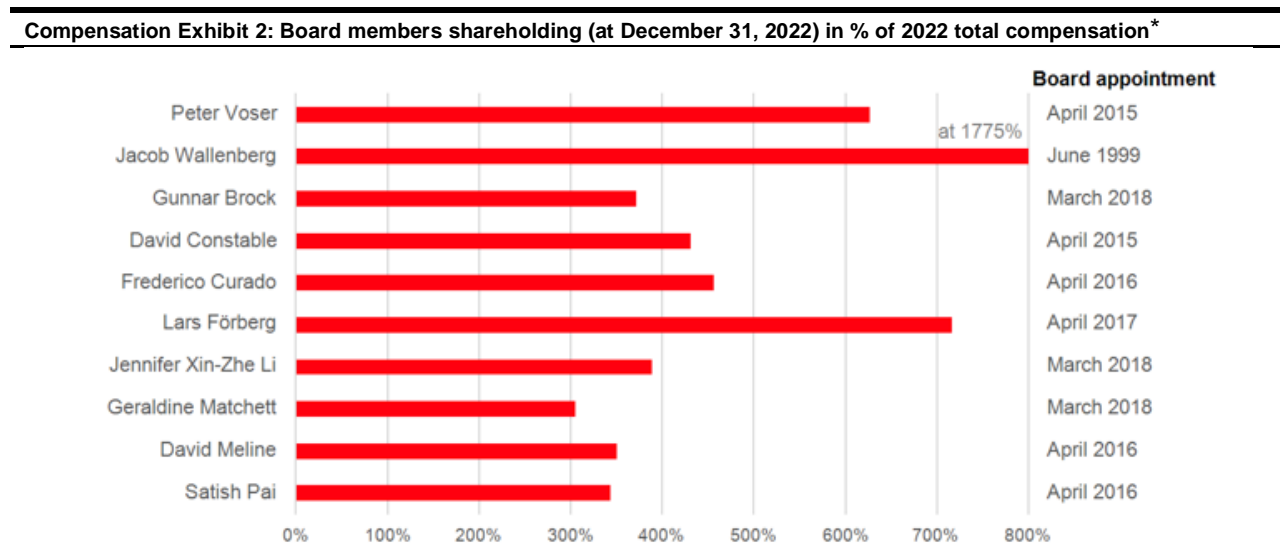
Compensation for the 2022-2023 term of office

The aggregate Board compensation for the 2022-2023 term of office (CHF 4,380,000) was within the maximum amount (CHF 4,400,000) approved at the 2022 Annual General Meeting (AGM).

Compensation Exhibit 1: Board compensation (in CHF) for the 2022-2023 term of office	
Aggregate compensation	4,380,000
Approved compensation amount	4,400,000

Shareholding of Board members

All Board members held ABB shares at December 31, 2022, worth at least 300 percent of their 2022 Board compensation.



* Based on share price of CHF 32.48, the 2022 Long-Term Incentive Plan (LTIP) reference price, and shares held at December 31, 2022.

EC compensation

Compensation structure as from 2022

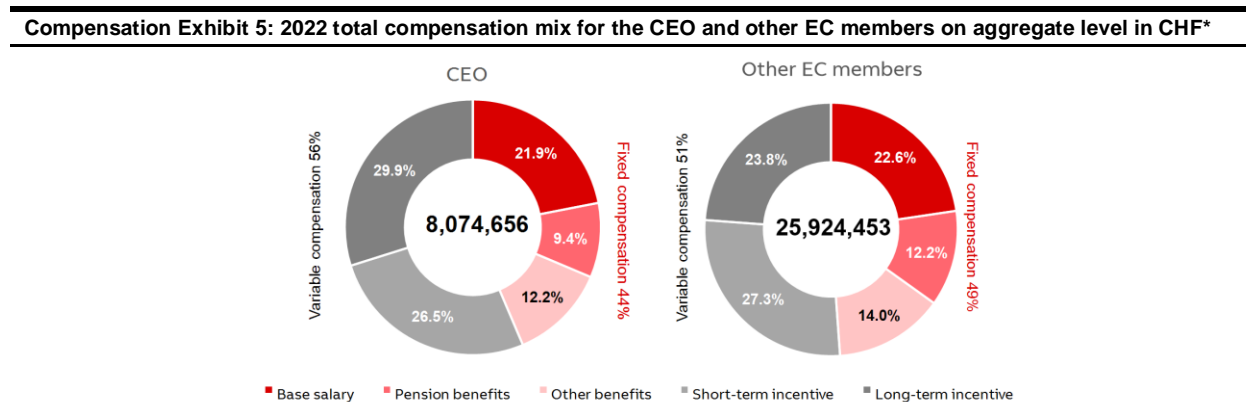
Compensation Exhibit 3: EC compensation structure as from 2022						
	Fixed compensation - base salary and benefits	Variable compensation - short-term incentive (AIP)		Variable compensation - long-term incentive (LTIP)		Wealth at risk/ Share ownership
Purpose and link to strategy	Facilitates attraction and retention of talented EC members; base salary compensates for the role and relevant experience; benefits protect against risks	Rewards annual Company, Business Area, functional and individual performance. Aligned with the Company's Annual Performance Plan		Rewards Company performance over a three-year period and encourages creation of long-term, sustainable value for shareholders. Aligned with the Company's Long-term Performance Plan		Aligns individual's personal wealth at risk directly to the ABB share price, and EC members' interests with those of shareholders in order to maintain focus on ABB's long-term success
Operation	Salary in cash, benefits in kind, and pension contribution	Annual awards, payable in cash after a one-year performance period		Annual grants in shares which may vest after three years, and are subject to performance conditions		Individuals are required to hold ABB shares
Opportunity level (as % of base salary)	Based on scope of responsibilities, personal experience and skillset	Minimum Target Maximum	<div><div>0%</div><div>100%</div><div>150%</div></div>	CEO		CEO
				Minimum Target Maximum	<div><div>0%</div><div>150%</div><div>300%</div></div>	500% of annual salary (net of taxes)
				Other EC members*		Other EC members
				Minimum Target Maximum	<div><div>0%</div><div>150%</div><div>300%</div></div>	400% of annual salary (net of taxes)
<p>* EC members with legacy employment contracts have a Target LTIP grant of 100 percent, and Max LTIP opportunity of 200 percent. The higher LTIP opportunity for the newer EC members is largely offset by lower fixed benefit costs.</p>						
Performance indicators	Changes to base salary take into account individual performance, future potential, broadening of responsibilities, and external benchmarking	CEO and Corporate Officers		All EC members		Exposure to ABB share price
		<div><div><div><div></div><div>20%</div></div><div><div></div><div>80%</div></div></div><div><div>• Group financial results</div><div>• Individual results</div></div></div>		<div><div><div><div></div><div>20%</div></div><div><div></div><div>50%</div></div><div><div></div><div>30%</div></div></div><div><div>• Average EPS</div><div>• Relative TSR</div><div>• Sustainability*</div></div></div>		
		Business Area Presidents				
		<div><div><div><div></div><div>20%</div></div><div><div></div><div>20%</div></div><div><div></div><div>60%</div></div></div><div><div>• Group financial results</div><div>• Business Area financial results</div><div>• Individual results</div></div></div>				
<p>* New for 2022</p>						

Total EC compensation for 2022

The aggregate EC compensation for 2022 (CHF 36,035,073) was within the maximum amount approved at the 2021 AGM (CHF 40,000,000).

Compensation Exhibit 4: EC compensation (in CHF) for 2022	
Effective aggregate compensation	36,035,073
Approved aggregate compensation	40,000,000

The larger portion of the CEO's 2022 total compensation was delivered via variable compensation (56 percent represented by short-term incentive and long-term incentive). For the other EC members, on an aggregate level, variable compensation represented 51 percent of their 2022 compensation. The following chart shows the composition of the 2022 total compensation for the EC members as of December 31, 2022.

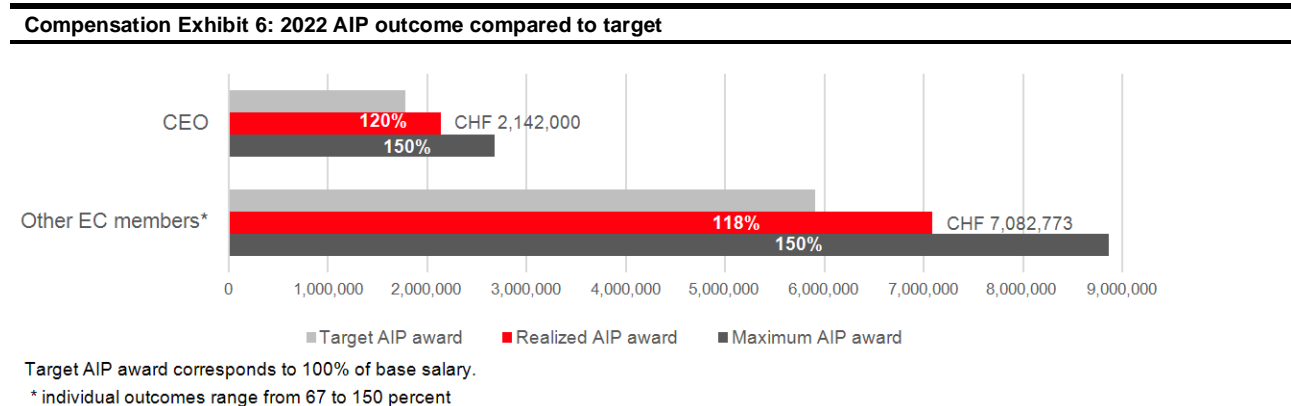


* Sum of percentage figures may differ from 100 percent due to rounding with one decimal.

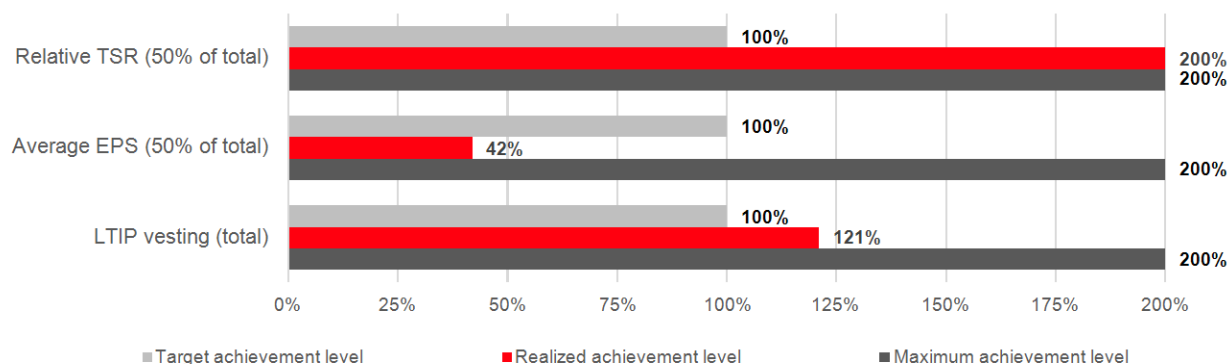
Realized variable compensation in 2022

Realized variable compensation considers the AIP award and the LTIP award at the end of their respective performance cycles, reflecting actual AIP payment and LTIP vesting, based on achievement of the respective plan performance measures.

The outcome of the 2022 AIP was above the target for most of the current EC members (118.3 percent on average), and the LTIP that vested in 2022 (2019 LTIP) exceeded the target level, with a final vesting level of 121.0 percent of target.



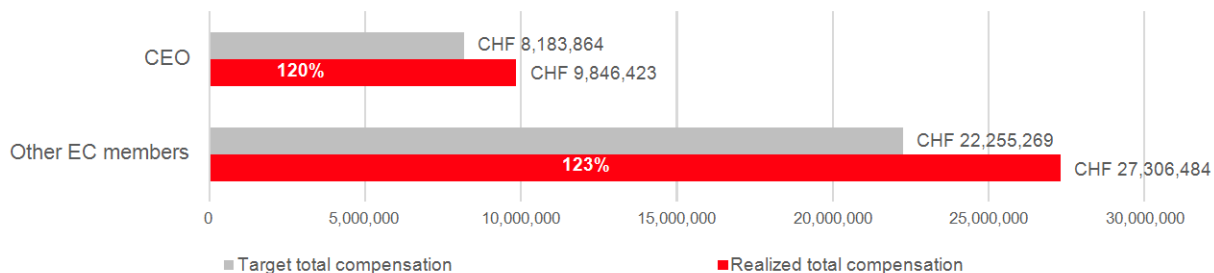
Compensation Exhibit 7: 2019 LTIP outcome compared to target



Realized total compensation in 2022

Considering the stated variable components above, the realized total compensation in 2022 was above the target total compensation for all EC members, driven by strong performance in 2022.

Compensation Exhibit 8: Realized total compensation in 2022 compared to target total compensation



Further details related to the realized compensation of each EC member and each compensation component are specified in Compensation Exhibit 44.

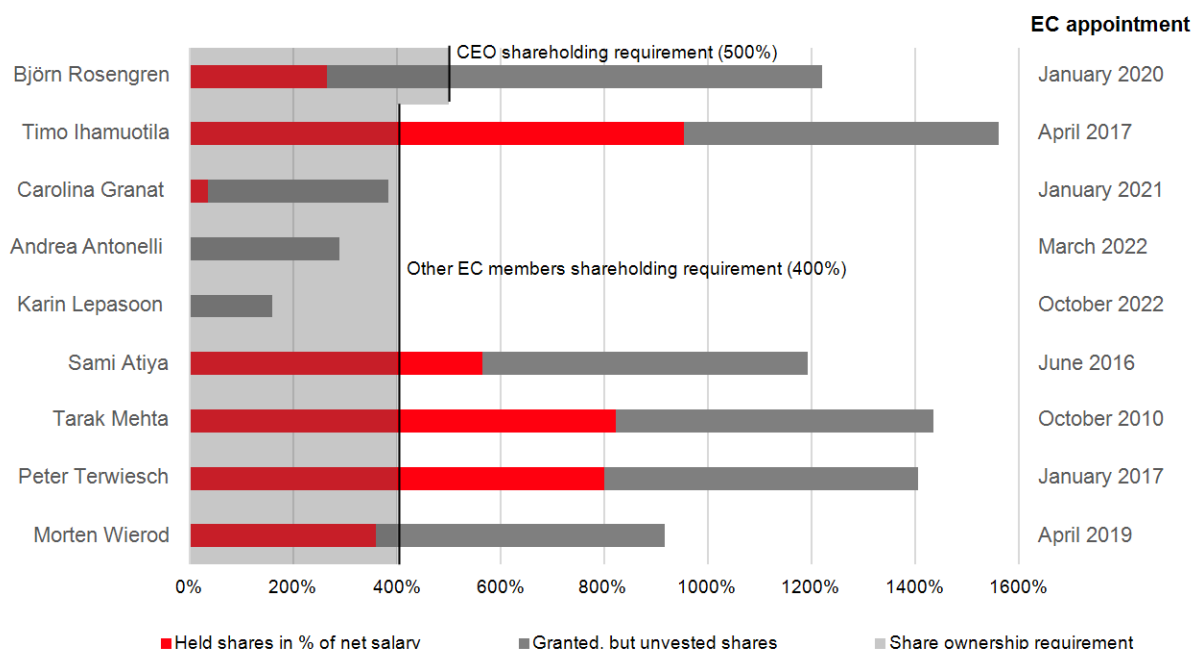
Shareholding of EC members

EC members may not sell their shares (except to meet tax and social security costs) until they achieve the required shareholding level.

Four out of nine EC members have already met and exceeded their share ownership requirement. Two other members are close to achieving their requirement, while three members have been appointed to the EC in the last two years.

When considering the number of granted, but unvested, ABB shares of current EC members as per December 31, 2022, it is expected that most will meet or exceed their share ownership requirement in 2023, after vesting of the 2020 LTIP grant.

Compensation Exhibit 9: EC shareholding compared to share ownership guideline*



* Based on share price of CHF 32.48, the 2022 LTIP reference price, and shares held at December 31, 2022. Future allocation of granted, but unvested, shares is based on target achievement level and relevant plan specific settlement: default settlement of the final 2020 LTIP, 2021 LTIP and 2022 LTIP awards is 100 percent in shares. Default settlement of replacement shares is 65 percent in shares (recipient may elect to receive 100 percent of the vested award in shares). The value of shares is compared against the annual base salary net of taxes, at December 31, 2022.

Compensation governance

The Compensation Report is prepared in accordance with the Ordinance against Excessive Remuneration in Listed Stock Corporations, the Directive on Information relating to Corporate Governance of the SIX Exchange Regulation, the rules of the stock markets of Sweden and the United States, where ABB shares are also listed, and the principles of the Swiss Code of Best Practice for Corporate Governance of economiesuisse.

ABB's Articles of Incorporation

ABB's Articles of Incorporation, approved by its shareholders, contain provisions on compensation which govern and outline the principles of compensation relating to our Board of Directors and Executive Committee. They can be found on ABB's Corporate Governance website new.abb.com/about/corporate-governance and are summarized below:

- **Compensation Committee** (Articles 28 to 31): The Compensation Committee (CC) is composed of a minimum of three members of the Board and are elected individually by the shareholders at the Annual General Meeting for a period of one year. It supports the Board in establishing and reviewing the compensation strategy, principles and programs, in preparing the proposals to the AGM on compensation matters and in determining the compensation of the Board and of the EC. The responsibilities of the CC are defined in more detail in the Board Regulations and Corporate Governance guidelines, which are also available on ABB's Corporate Governance website.

- **Compensation principles** (Article 33): Compensation of the members of the Board consists of fixed compensation only, which is delivered in cash and shares (with an option to elect for shares only). Compensation of the members of the EC consists of fixed and variable compensation. Variable compensation may comprise short-term and long-term elements. Compensation may be paid in cash, shares or other benefits.
- **“Say-on-pay” vote** (Article 34): Shareholders approve the maximum aggregate amount of compensation of the Board for the following Board term and of the EC for the following financial year.
- **Supplementary amount for new EC members** (Article 35): If the maximum approved aggregate compensation amount is not sufficient to also cover the compensation of newly promoted/hired EC members, up to 30 percent of the last maximum approved aggregate amount shall be available as a supplementary amount to cover the compensation of such new EC members.
- **Loans** (Article 37): Loans may not be granted to members of the Board or of the EC.

Authority levels in compensation matters

The CC acts in an advisory capacity while the Board retains the decision authority on compensation matters, except for the maximum aggregate compensation amounts of the Board and of the EC, which are subject to the approval of shareholders at the AGM. The authority levels of the different bodies on compensation matters are detailed in Compensation Exhibit 10. Shareholders also have a consultative vote on the prior year's Compensation Report at the AGM and a binding vote on the maximum aggregate amount of compensation of the Board for the following Board term and of the EC for the following financial year.

Compensation Exhibit 10: Authority levels in compensation matters				
	CEO	CC	Board	AGM
Compensation policy including incentive plans	●	●	●	
Maximum aggregate compensation amount for the EC		●	●	●
CEO compensation		●	●	
Individual compensation of other EC members	●	●	●	
Performance target setting and assessment of the CEO		●	●	
Performance target setting and assessment of other EC members	●	●	●	
Shareholding requirements for CEO and other EC members		●	●	
Maximum aggregate compensation amount for the Board		●	●	●
Individual compensation of Board members		●	●	
Compensation Report		●	●	Consultative vote

● Proposal ● Recommendation ● Approval

Activities of the CC in 2022

The CC meets as often as business requires but at least four times a year. In 2022, the CC held seven meetings and performed the activities described in Compensation Exhibit 11. The CEO, the Chief Human Resources Officer (CHRO) and the Head of Performance and Reward also attend all or part of the CC meetings in an advisory capacity. The Chairman of the CC may decide to invite other executives upon consultation with the CEO, as appropriate. Executives do not attend the meetings or the parts of the meetings in which their own compensation and/or performance are being discussed. Details on meeting attendance of the individual CC members (number of meetings held during 2022, their average duration, as well as the attendance of the individual members) are provided in the section “Board of Directors – Meetings and attendance” of “Item 6. Directors, Senior Management and Employees”.

Compensation Exhibit 11: CC activities during 2022	
Strategy	
	Review of the Short-Term Incentive plan (Annual Incentive Plan / AIP)
	Continued monitoring of link between sustainability and compensation
EC Compensation	
	Review of compensation benchmarking for EC members (bi-annual activity)
	Review of recommendations on individual compensation for EC members
	Review of the share ownership of EC members
	Review and approval of compensation for new and departing EC members
Performance – relating to past performance cycle	
	Assessment of AIP awards for 2022
	Assessment of achievement of performance targets for LTIP awards vesting in 2022
Performance – relating to forthcoming performance cycle	
	Setting of AIP design, measures and targets for 2022
	Consideration of forecast AIP outcomes for 2022
	Consideration of preliminary AIP measures and targets for 2023
	Setting of performance targets for LTIP grants in 2022
	Consideration of forecast achievement against performance targets for unvested LTIP grants
Compliance	
	Review of CC annual plan
	Review of feedback from Stakeholder Engagement meetings
	Regulatory and market updates
	Review of the Compensation Report for publication
	Preparation of maximum aggregate compensation for the Board to be submitted for AGM vote
	Preparation of maximum aggregate compensation for the EC to be submitted for AGM vote

The Chairman of the CC reports to the full Board after each CC meeting. The minutes of the CC meetings are available to the members of the Board.

The CC retains independent, external advisors for compensation matters. In 2022 PricewaterhouseCoopers (PwC) was mandated to provide consulting services related to executive compensation matters. In addition to its CC advisory role, PwC also provides human resources, tax and advisory services to ABB.

Sustainability related considerations in ABB's compensation

There are several sustainability related considerations that play an important role in our compensation philosophy, of which one is to foster the link between the sustainability performance measures under our sustainability strategy and the variable compensation for our EC and senior management.

Impact of sustainability performance on variable compensation

One of the main subjects of the CC's recent decisions was to reinforce the link of ABB's sustainability strategy - and its associated ambitious targets for 2030 - to ABB's key variable compensation programs AIP and LTIP. These decisions resulted in a suite of changes which we believe keep ABB in line with leading compensation market practices and reinforce our commitment towards sustainability and long-term value creation.

With regard to the AIP, ABB recently enlarged the mandatory inclusion of sustainability performance measures in the individual component of the relevant AIP for its executives and further employees in the organization. All EC members have two or three sustainability goals (out of maximum of three) in the individual component of their AIP. While all EC members had an environment target in 2022, Business Area Presidents had a safety target, the CFO a governance target and other Corporate Officers a social target.

In regard to the LTIP granted to ABB's senior management, including the EC, a sustainability measure with a weighting of 20 percent forms part of the performance measures.

- For the 2022 LTIP, the sustainability measure is the Company's scope 1 and 2 greenhouse gas (GHG) emissions reduction at the end of the three-year performance period (2022-2024), compared to the 2019 baseline.
- The 2022 sustainability measure has also been applied to the 2023 LTIP, namely scope 1 and 2 GHG emissions reduction at the end of the three-year performance period (2023-2025), compared to the 2019 baseline.
- Details of the long-term GHG emissions reduction targets can be found in ABB's Item 4. Information on the Company—Sustainability activities.

Employee remuneration

ABB applies a holistic total remuneration approach, generally consisting of fixed base salary, variable performance-linked pay, pension contributions and benefits. The key programs of ABB's compensation structure and their strategic links to our employee value proposition and sustainability strategy are summarized in the Compensation Exhibit 12 below.

Compensation Exhibit 12: Compensation structure for employees

Program	Operation and purpose	Link to ABB's employee value proposition and sustainability strategy
Base Salary	Offered to all employees, compensating for the role and relevant experience of the employee while changes to base salary take into account individual performance, future potential and external benchmarking.	Facilitating attraction and retention of employees.
Short-Term Incentive	Offered to ca. 80 percent of ABB's workforce, rewarding annual performance.	Helping to establish strong alignment with the Company's Annual Performance Plan, which may include financial and/or sustainability targets.
Annual Incentive Plan (AIP)	Offered to ca. 45 percent of ABB's workforce (employees outside of the Sales & Marketing functions and Production areas).	Rewarding participants, where appropriate, for the achievement of financial and sustainability targets at Group and business level, and other organizational and individual goals.
Production Plans	Offered to ca. 25 percent of ABB's workforce (employees of Production areas).	Rewarding participants for the achievement of productivity and other operational targets at local business level.
Sales Incentive Plans	Offered to ca. 10 percent of ABB's workforce (employees of the Sales & Marketing functions).	Rewarding participants for the achievement of financial targets at a local business and individual level.
Long-Term Incentive	Offered to ca. 800 executives and senior leaders of ABB.	Encouraging the creation of long-term, sustainable value for shareholders, and delivery of long-term strategic goals.
Long-Term Incentive Plan (LTIP) with performance conditions	Offered to ca. 100 executives, who significantly impact ABB's performance and long-term success of the business. After completion of a three-year plan period and subject to the achievement of the plan specific performance measures, the award is earned and delivered.	Aligning with the Company's Long-Term Performance Plan, and facilitating retention of senior executives.
Restricted Shares without performance conditions	Offered to ca. 700 senior leaders and key talent who influence ABB's performance and long-term success of the business. After completion of a three-year plan period, the award is earned and delivered.	Facilitating retention of senior managers. Supports aligning employees' interests with the interests of external shareholders and maintaining focus on the long-term success of the Company.
Employee Share Acquisition Plan	Offered to ca. 100,000 employees in over 60 countries, providing the opportunity to purchase shares in ABB one year after the start of a plan, at a price which will be fixed at the beginning of each annual plan cycle, and become ABB shareholders.	Supports aligning employees' interests with the interests of external shareholders and maintaining focus on the long-term success of the Company.
Benefits (selection)	Offered to all employees by country, subject to the relevant local market practice.	Protecting against risks, and help facilitating the attraction and retention of employees.
Risk Benefits	These generally include retirement, insurance and healthcare plans.	Providing support for the employees and their dependents in case of retirement, disability or death.
Parental Leave	A global and gender-neutral program, offered to all employees, on the birth or adoption of a new child, which sets out a minimum standard on paid parental leave that supports all family types. The primary caregivers receive 12 weeks of paid leave and the secondary caregivers 4 weeks.	Aligning with the ABB value of "Care".
Employee Assistance	A global program, offered to all employees. The program supports the employee's emotional, practical and physical wellbeing by offering paid counseling on emotional health, family concerns and workplace concerns.	Aligning with the ABB value of "Care".
Car or Transportation Allowance	Offered to selected employees based on business need or market practice, with any car provision being progressively migrated to e-vehicles or transportation allowances which can be used to contribute to public transport, cycle or other transport needs.	Addressing changed needs related to mobility by providing greater flexibility to opt for more environmentally friendly solutions.

Board compensation policy

The compensation policy for the members of the Board is designed to attract and retain experienced people to the Board of Directors. Compensation takes into account the responsibilities, time and effort required to fulfill their roles on the Board and its Committees, and it is generally positioned at levels similar to other Swiss listed companies of comparable size and complexity.

Compensation structure

A fixed fee is payable for the Chairman, Vice-Chairman and members of the Board, and additional fees are payable for chairing or membership of a Board Committee, except for the Chairman and Vice-Chairman. Board members are paid for their service over an annual Board term that starts with their election at the AGM. Payment of fees is made in semi-annual installments in arrears.

Each fee is delivered in cash and shares. Board members are required to take 50 percent of their compensation in shares, but they may elect to receive all their fees in shares. The number of shares delivered is calculated prior to each semi-annual payment by dividing the monetary amount to which the Board members are entitled by the average closing price of the ABB share over a predefined 30-day period. The shares are subject to a three-year restriction period during which they cannot be sold, transferred or pledged. Any restricted shares are unblocked when the Board member leaves the Board.

Implementation of Board compensation policy

Board fees by role

As mentioned above, the levels and mix of Board members' compensation are regularly compared against the compensation of non-executive Board members from a cross-section of publicly traded companies in Switzerland that are part of the Swiss Market Index (i.e., Adecco, Alcon, Geberit, Givaudan, Holcim, Lonza, Richemont, SGS, Sika, Swisscom, Swiss Life, Zurich Insurance). Such a review was last undertaken in 2020, and there was no adjustment made to Board fees for the term of office from the 2022 AGM to the 2023 AGM, as set out in Compensation Exhibit 13. There has been no change to the individual Board fees since 2015.

Compensation Exhibit 13: Board fees (in CHF) for the current term of office	
Chairman of the Board ⁽¹⁾	1,200,000
Vice-Chairman of the Board ⁽¹⁾	450,000
Member of the Board	290,000
Additional committee fees:	
Chairman of FACC ⁽²⁾	110,000
Chairman of CC or GNC ⁽²⁾	60,000
Member of FACC ⁽²⁾	40,000
Member of CC or GNC ⁽²⁾	30,000

(1) The Chairman and the Vice-Chairman do not receive any additional committee fees.

(2) CC: Compensation Committee,
FACC: Finance, Audit and Compliance Committee,
GNC: Governance and Nomination Committee.

Total Board compensation

The compensation paid to the Board members for the calendar year 2022 and for the term of office from the 2022 AGM to the 2023 AGM are disclosed in Compensation Exhibit 14 below and in Compensation Exhibits 35 and 36, respectively, in the section “Compensation tables and share ownership tables”.

At the 2022 AGM, the shareholders approved a maximum aggregate compensation amount of CHF 4.4 million for the 2022-2023 Board term. This amount equals the approved amount for the previous Board term, as the compensation per Board member remained unchanged. The Board compensation to be paid for the 2022-2023 Board term is CHF 4.38 million and is therefore within the amount approved by the shareholders.

Compensation Exhibit 14: Board compensation (in CHF)		
Board of Directors	Board term	
	2022–2023	2021–2022
Number of members	10	10
Total compensation	4,380,000	4,380,000
Maximum aggregate compensation amount approved at previous AGM	4,400,000	4,400,000

Compensation of former Board members

In 2022, no payment was made to any former Board member.

Compensation for services rendered

In 2022, ABB did not pay any fees or compensation to the members of the Board for services rendered to ABB other than those disclosed in this report.

Shareholding of Board members

The members of the Board collectively owned less than 1 percent of ABB's total shares outstanding at December 31, 2022.

Compensation Exhibit 37 in the section “Compensation tables and share ownership tables” shows the number of ABB shares held by each Board member at December 31, 2022, and 2021. Except as described in this Compensation Exhibit, no member of the Board and no person closely linked to a member of the Board held any shares of ABB or options in ABB shares.

Shares delivered to Board members as part of their compensation are blocked for a period of three years.

Compensation Exhibit 2 in the section “Compensation at a glance” shows the wealth at risk for each Board member, comparing the value of shares held at December 31, 2022, with the total compensation for the 2022-2023 term of office. At December 31, 2022, all Board members held ABB shares worth at least 300 percent of their 2022 total ABB Board compensation.

Executive Committee compensation policy

The EC compensation policy reflects ABB's commitment to attract, motivate and retain people with the talent necessary to strengthen its position as a leading global technology company.

Compensation structure

The compensation structure is designed to be competitive, based on performance, and to encourage executives to deliver outstanding results and create sustainable shareholder value without taking excessive risks. The EC compensation framework therefore balances fixed and variable compensation. Variable compensation is provided through short-term and long-term incentives based on strategic, financial and sustainability related targets, recognizing Group, Business Area and Corporate Function performance as well as individual performance.

This structure is linked to our strategy and is illustrated in Compensation Exhibit 3 in the section “Compensation at a glance”.

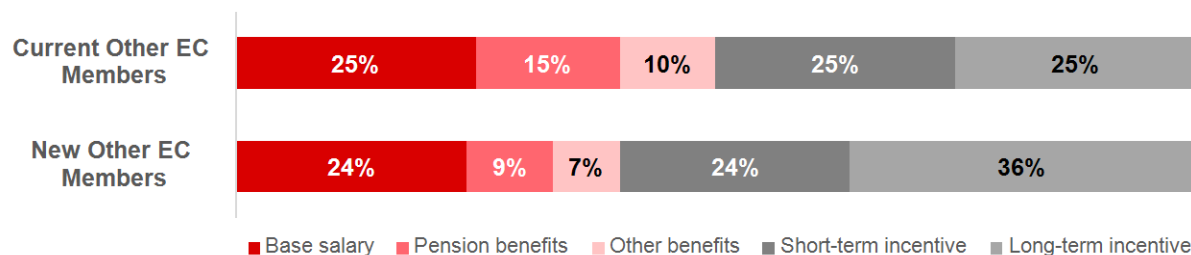
A significant portion of total compensation depends on variable pay components, which require the achievement of challenging performance targets, in alignment with ABB Annual and Long-Term Performance Plans.

The target AIP award is defined as a percentage of base salary, currently 100 percent for all EC members. There is no award under the AIP if performance is below threshold on all financial and individual performance measures. When performance exceeds targets, the maximum award is capped at 150 percent of the targeted amount.

The target LTIP grant size is defined as a percentage of base salary, currently 150 percent for the CEO and 100 to 150 percent for all other EC members. There will be no award under the LTIP if performance is below threshold for all applicable measures. When performance exceeds targets, the maximum award is capped at 200 percent of the conditional grant.

From 2022, the policy for the mix of fixed and variable target compensation elements for new EC members has been adjusted to provide a greater emphasis on variable pay. This is achieved by increasing the target LTIP grant size from 100 percent to 150 percent of base salary, while reducing the level of pension contributions and other benefits. The reduction of pension contributions and other benefits substantially offsets the increase of the LTIP component, and represents a shift from guaranteed pay elements to pay at risk. Fixed compensation for new EC members represents 40 percent of their target total compensation, in comparison to 50 percent for long-standing EC members. Compensation Exhibit 15 below illustrates the policy change for new EC entrants (excluding the CEO), applying an entry level salary of CHF 700,000 and an incumbent age of 50 years to reflect the pension benefits.

Compensation Exhibit 15: Policy for mix of target compensation for EC members (excluding CEO) appointed prior to and after 2022*



* Note that, by exception, the new mix of target compensation has not been applied to the newly appointed Chief Communications and Sustainability Officer.

Competitive positioning of compensation

The Board considers competitive market data when setting the compensation policy for the EC. It is also one of several factors in positioning the target compensation for individual EC members which include:

- individual profile of the EC member in terms of experience and skills;

- individual performance and potential;
- market value of the role (compensation benchmarking).

EC compensation benchmark reviews are performed every other year. The CC conducted a comprehensive compensation benchmarking review in 2022, based on the three peer groups, similar to those which were used in 2020.

While each of these peer groups match the size, scope and complexity of ABB, and exclude companies from the financial services sector, the use of a specific peer group depends on the nature of the role and the source of relevance. For example, a stronger emphasis is placed on the Global Industry peer group for operational roles and in compensation design, and on the Pan-European Market peer group for functional roles. In all cases, the other two peer groups are used to stress test the findings of the primary peer group (see the summary in Compensation Exhibit 16 below).

Compensation Exhibit 16: Peer groups for EC compensation benchmarking			
Peer Group	Composition	Companies	Rationale
Global Industry	A tailored group of 16 global industry peer companies, matching the scale and complexity of ABB	AB SKF, Alstom, Airbus, Atlas Copco, Denso, Eaton, Emerson Electric, Honeywell, Mitsubishi Electric, Mitsubishi Heavy Industries, Schneider Electric, Schindler, Siemens, Thermo Fisher Scientific, Toshiba, Traton	Focus for Business Area roles and benchmarking compensation design
Pan-European Market	A panel of 50 cross-industry European companies, matching the scale and complexity of ABB	See footnote (1)	Focus for Corporate roles; continuity and stability of data points
Swiss Market	A panel of 16 Swiss headquartered companies, matching the scale and complexity of ABB	Adecco, Geberit, Givaudan, Glencore, Kuehne & Nagel, Holcim, Nestle, Novartis, Richemont, Roche, Schindler, SGS, Sika, STMicroelectronics, Swatch, Swisscom	Swiss location of headquarters

(1) AB InBev, Adidas, Air Liquide, Associated British Foods, AstraZeneca, BAE Systems, Bayer, Bouygues, British American Tobacco, Compass Group, Continental, CRH, Danone, Endesa, EssilorLuxottica, Fresenius, Fresenius Medical Care, GlaxoSmithKline, HeidelbergCement, Heineken, Henkel, Hennes & Mauritz, Holcim, Iberdrola, Imperial Brands, Industria de Diseno Textil, Jeronimo Martins SGPS, Kuehne & Nagel, Linde, L'Oreal, Michelin, National Grid, Naturgy Energy Group, Nokia, Novartis, Novo Nordisk, OMV, Philips, Rio Tinto, Safran, Saint Gobain, Sanofi, SAP, Schneider Electric, Telefonaktiebolaget LM Ericsson, Thales, Umicore, Veolia Environment, Vinci and Vodafone.

It is the intention to position target compensation for individual EC members between the median and upper quartile of the relevant peer group(s) considering the other factors referenced above (e.g., the EC member's skills, experience, performance, potential).

The comparison of ABB to its compensation benchmarking peer groups shown in Compensation Exhibit 17 below is based on the latest review in 2022. This data shows that ABB is typically positioned at the median of key comparator indicators (market capitalization, revenues, and number of employees) against the Global Industry and Pan-European Market peer groups, and at the upper quartile of the Swiss Market peer group.

Compensation Exhibit 17: Comparison of ABB to compensation benchmarking peer groups⁽¹⁾

	Market capitalization ⁽²⁾⁽³⁾⁽⁴⁾	Revenues ⁽²⁾⁽⁴⁾⁽⁵⁾	Number of employees ⁽⁵⁾⁽⁶⁾
ABB	58.8	27.5	104,400
Global Industry			
Upper Quartile	78.5	36.3	133,924
Median	49.0	31.1	98,118
Lower Quartile	16.6	17.0	77,017
Pan-European Market			
Upper Quartile	75.4	40.0	124,435
Median	32.6	27.9	89,012
Lower Quartile	20.2	22.7	62,660
Swiss Market			
Upper Quartile	65.1	38.2	85,017
Median	32.0	16.4	58,635
Lower Quartile	20.1	9.1	30,348

(1) Data for market capitalization, revenues and number of employees are sourced from Thomson Reuters.

(2) Market capitalization and revenues are in CHF millions.

(3) Market capitalization is averaged over a period of three months (June 20, 2022, until September 20, 2022).

(4) All currencies have been converted to CHF, where needed, applying full-year average currency exchange rates based on the period from July 1, 2021, to June 30, 2022.

(5) Revenues and number of employees as per last financial year prior to October 2022.

(6) Number of employees in full-time equivalent (FTE) unless FTE information was not available, then in total number of employees.

Compensation elements

Compensation Exhibit 3 in the section “Compensation at a glance” sets out the purpose and link to strategy, the operation, the opportunity level and the performance measures. In addition, this section provides further details for each compensation element.

Fixed compensation - base salary and benefits

Purpose and link to strategy

Facilitate the attraction and retention of talented EC members; base salary compensates for the role and relevant experience; benefits protect against risks.

Base salary is paid in cash. Benefits consist primarily of retirement, insurance and healthcare plans that are designed to provide a reasonable level of support for the employees and their dependents in case of retirement, disability or death.

Opportunity levels

Base salary is set with reference to the scope of responsibilities, personal experience and skills, and competitive market data.

Benefit plans are set in line with the local competitive and legal environment and are, at a minimum, in accordance with the legal requirements of the respective country.

Performance measures and weighting

Base salary is adjusted considering the factors set out under opportunity levels above, the executive's performance as well as their future potential.

Variable compensation - Annual Incentive Plan (AIP)

Purpose and link to strategy

The AIP is designed to reward EC members for the Group's results, the results of their Business Area or Corporate Function and their individual performance over a time horizon of one year, and is aligned with the Annual Performance Plan approved by the Board.

Opportunity levels

The AIP opportunity levels for the EC are 100 percent of base salary at target with a maximum opportunity of 150 percent.

Performance measures and weighting

The AIP structure is designed to incentivize operational delivery and underpin our performance culture. As such, it is focused on key priorities, with a maximum of five measures.

- A common Group financial measure with a 20 to 25 percent weighting.
- Up to three Group or Business Area financial measures, with a 55 to 60 percent weighting.
- An individual measure with a 20 percent weighting. This individual component is informed by two or three goals which may include a combination of quantitative and qualitative goals.
 - From 2022, at least two of these goals relate to sustainability.
 - The final outcome against this individual measure is a discretionary judgment based on the combined performance against all individual goals.

A summary of the composition and total weighting of the measures for all EC members is set out in Compensation Exhibit 18.

Compensation Exhibit 18: Composition and weighting of AIP measures for EC members		
	CEO and Corporate Officers ⁽¹⁾	Business Area Presidents
Common Group financial measure	25%	20%
Other Group financial measures	Up to three measures 55%	n.a.
Business Area financial measures	n.a.	Up to three measures 60%
Individual measure	Includes up to three goals (minimum two sustainability related) 20%	Includes up to three goals (minimum two sustainability related) 20%
Total	100%	100%

(1) Corporate Officers include Chief Financial Officer, Chief Human Resources Officer, General Counsel and Chief Communications and Sustainability Officer.

Other design features

For each performance measure, a target will be set corresponding to the expected level of performance that will generate a target (100 percent) award. For each measure except the individual measure, a minimum level of performance, below which there is no award (threshold) and a maximum level of performance, above which the award is capped at 150 percent of the target (maximum), will also be defined.

The payment schedule for financial AIP measures is calculated mathematically as summarized in the following Compensation Exhibit 19. For Group and Business Area financial measures, the award percentage achievements between threshold and target, as well as between target and maximum are determined by linear interpolations between these award points.

Compensation Exhibit 19: Payment schedule for the AIP of EC members

Level of performance	Below threshold	Threshold	Target	Maximum
Award achievement per financial measure	0%	>0%	100%	150%

The outcomes of the financial AIP measures are subject to appropriate discretionary upward or downward adjustments by the CC for non-operational items and other adjustment principles agreed with the Board, if and to the extent the CC considers this appropriate.

In addition, the CC/Board have discretionary authority to adjust the results and/or the AIP award. This specifically includes a downwards adjustment based on safety performance, including fatalities.

Variable compensation - Long-Term Incentive Plan (LTIP)**Purpose and link to strategy**

Rewards the achievement of predefined performance targets over a three-year period. Encourages the creation of long-term, sustainable shareholder value creation and is aligned with the Company's Long-Term Performance Plan approved by the Board.

Opportunity levels

For the CEO, the LTIP opportunity levels are 150 percent of base salary at target, with a maximum opportunity of 300 percent of base salary.

As per the policy change announced in last year's report, the target and maximum opportunity levels for EC members newly appointed from 2022 are 150 percent and 300 percent of base salary, respectively. This is designed to provide an increased focus on variable, performance related compensation and is mostly offset by a reduction in costs related to pension and other benefits.

The LTIP opportunity levels for EC members appointed prior to 2022 are 100 percent of base salary at target, with a maximum opportunity of 200 percent of base salary. This has also been applied, by exception, to the newly appointed Chief Communications and Sustainability Officer in line with external market data, reflecting the scope of the role.

The previously existing discretionary option to increase or decrease individual target grants under the LTIP for EC members, except the CEO, has been discontinued as from 2022, except for the option to make no grants in certain circumstances.

Performance measures and weighting

The LTIP has, from 2022, three performance measures:

Earnings Per Share (EPS)

- Achievement against this measure is determined by ABB's average EPS over a three-year period. The average EPS result is calculated from the sum of the EPS for each of the three relevant years, divided by three.
- EPS is defined as "Diluted earnings per share attributable to ABB shareholders, calculated using Income from continuing operations, net of tax, unless the Board elects to calculate using Net income for a particular year".
- Appropriate threshold (zero), target (100 percent) and maximum (200 percent) award points are reviewed by the CC on an annual basis.
- Performance target and award points are set using the Company's Long-term Performance Plan and are calibrated with an independent "outside-in" view, taking into account the growth expectations, risk profile, investment levels and profitability levels that are typical for the industry.

- Adjustments to the outcome of the EPS achievement level may be considered for items which are not part of, or the result of, the normal course of business operation and/or which were not considered, either by way of inclusion or exclusion, for the target-setting of a specific LTIP launch. Only the net impact of such adjustments over the vesting period of the respective LTIP grant will be considered.

Total Shareholder Return (TSR)

- Achievement against this measure is determined by ABB's relative TSR performance against a defined peer group.
- The constituents of the peer group and the appropriate threshold (zero), target (100 percent) and maximum (200 percent) award points are reviewed by the CC on an annual basis.
- The TSR calculations are made for the reference period beginning in the year of the conditional grant of the shares and ending three years later. The evaluation is performed by an independent third party.
- For grants from 2022, the award curve for the TSR measure has been adjusted to become more challenging. The threshold point for awards, above which vesting starts, has been moved from the 25th percentile to the 50th percentile (P50) of the TSR peer group, i.e., there is no vesting for performance below P50.
- Vesting for P50 achievement remains at 100 percent of target, and vesting for a 75th percentile (P75) achievement level remains at 200 percent of target (capped). There is a linear vesting for an achievement between P50 and P75 (100 to 200 percent of target).

Sustainability

- The Board determines on an annual basis the LTIP specific sustainability measure(s), as well as related target(s) and award points, to incentivize material progress towards our 2030 sustainability strategy commitments.
- Appropriate threshold (zero), target (100 percent) and maximum (200 percent) award points are reviewed and approved by the CC on an annual basis.
- Adjustments to the outcome of the sustainability achievement may be considered for items which are not part of, or the result of the normal course of business operation and/or which were not considered, either by way of inclusion or exclusion, for the target-setting of a specific LTIP launch. Only the net impact of such adjustments over the vesting period of the respective LTIP grant will be considered.

The relative weighting of measures for the LTIP is as follows:

- EPS measure: 50 percent
- TSR measure: 30 percent
- Sustainability measure: 20 percent

Other design features

The number of shares to be granted is determined by dividing the grant value by the average share price over the period of 20 trading days prior, and 20 trading days after, the date of publication of ABB's full year financial results. Settlement of the LTIP is three years after grant, subject to achievement of performance conditions, defined prior to grant.

The actual settlement of shares awarded will vary between zero and 200 percent of the shares conditionally granted, according to achievement against the performance measures stated above.

The vesting schedule for the LTIP is shown in the following Compensation Exhibit 20. The award percentage achievements between threshold and target, as well as between target and maximum, are determined by linear interpolations between these award points.

Compensation Exhibit 20: Vesting schedule for the LTIP of EC members*				
Level of performance	Below threshold	Threshold	Target	Maximum
Award achievement per measure	0%	>0%	100%	200%

* For the TSR measure, the threshold point equals the target point.

The CC has the discretion to adjust the formulaic LTIP vesting outcome, to reflect the overall performance of ABB over the performance period.

Default settlement of the final LTIP award is 100 percent in shares, and beginning with grants made conditionally in 2020, an automatic sell-to-cover is in place for employees who are subject to withholding taxes.

LTIP shares are subject to malus and clawback rules, which include illegal activities, any financial misstatement and reputational damage that have a material impact on ABB Ltd or one of its subsidiaries. This means that the Board may decide not to award any unsettled or unvested incentive compensation (malus), or may seek to recover long-term incentive compensation that has been settled in the past (clawback). Clawback applies for a period of up to five years following the originally scheduled plan specific vesting date.

The CC also has the ability to suspend the delivery of awards if it is likely that the Board will determine that the malus or clawback provisions may potentially apply (e.g., if the employee is subject to an external investigation).

For LTIP grants from 2021, there is no automatic accelerated vesting of awards in the event of a change of control.

For LTIP grants from 2022, participants are entitled to receive a cash amount (a “dividend equivalent payment”) on each vested award share that is equal to the total dividends per share paid by the Company on the ABB Ltd share between the grant date and the delivery date of the vested award. This is offset by reducing other benefits by a similar level over the life of the share grant.

Total wealth at risk / Share ownership

Purpose and link to strategy

To align EC members’ personal wealth directly with the interests of shareholders in order to maintain focus on the long-term success of the Company.

Share ownership program

EC members are required to retain all shares vested from the Company’s LTIP and any other share-based compensation until their share ownership requirement is met. In circumstances where there is a withholding tax obligation, the number of shares received will be considered to be the number of shares vested minus the shares sold under the default sell-to-cover facility.

The share ownership requirement is equivalent to a multiple of the EC member’s annual base salary, net of taxes (see Compensation Exhibit 3 in the section “Compensation at a glance”). These share ownership requirements are aligned with market practice and result in a wealth at risk for each EC member which is aligned with shareholder interests.

Only vested shares owned by an EC member and their spouse count for the comparison of the actual share ownership against the share ownership requirement.

The CC reviews the status of EC share ownership on an annual basis. It also reviews the required shareholding amounts annually, based on salary and expected share price developments.

Notice period, severance provisions and non-competition clauses

Employment contracts for EC members include a notice period of 12 months, during which they are entitled to their annual base salary, short-term incentive and benefits. In accordance with Swiss law and ABB's Articles of Incorporation, the contracts for the EC members do not allow for any severance payment.

Non-compete agreements have been entered into with the CEO and all other EC members for a period of 12 months after their employment. Compensation for such agreements, if any, may not exceed the EC member's last total annual cash remuneration (comprising of base salary, short-term incentive and benefits).

Implementation of EC compensation policy

Overview

EC members received total compensation of CHF 36.0 million in 2022, compared with CHF 39.2 million in 2021, as summarized in Compensation Exhibit 21 below and presented in detail in Compensation Exhibits 38 and 39.

At the 2021 AGM, the shareholders approved a maximum aggregate compensation amount of CHF 40 million for the EC for the year 2022. The EC total compensation for 2022 amounted to CHF 36.0 million and is therefore within the approved amount (see Compensation Exhibit 21).

Compensation Exhibit 21: Total compensation of EC members (monetary values in CHF)⁽¹⁾		
	Calendar year	
	2022	2021
Number of active EC members	9	9
Base salaries	8,341,720	8,713,406
Pension benefits	4,334,281	4,795,259
Other benefits	4,894,480	4,819,803
Total fixed compensation	17,570,481	18,328,468
Short-term incentives	9,879,882	12,144,280
Long-term incentives (fair value at grant)	8,584,710	8,684,298
Total variable compensation	18,464,592	20,828,578
Total compensation	36,035,073	39,157,046
Maximum aggregate compensation approved at AGM	40,000,000	39,500,000

(1) For an overview of compensation by individual and component, please refer to Compensation Exhibits 38 and 39 in the section "Compensation tables and share ownership tables" below. An overview of 2022 realized compensation by individual is provided in Compensation Exhibit 44 in the same section.

The total compensation for the EC in 2022 decreased by 8.0 percent compared to 2021. This mainly reflects the impact of the lower 2022 AIP awards compared to 2021. The overall lower pension benefits for 2022 compared to 2021 are informed by the application of our new compensation structure for new EC members where pension benefits and other benefits have been lowered and replaced by an increased LTIP grant size level, to provide higher emphasis on performance instead of guaranteed compensation.

Compensation mix

The ratio of fixed to variable components in any given year depends on the performance of the Company and individual EC members against predefined performance targets.

Compensation Exhibit 5 in the section “Compensation at a glance” shows the composition of the 2022 total annual compensation for the CEO and for other current EC members on an aggregate level, specifying the split of its five compensation components.

In 2022, the variable compensation of the CEO was 56 percent of his total annual compensation (previous year: 61 percent). For the other EC members, the variable compensation was 51 percent on average (previous year: 54 percent). The reductions in 2022 from the prior year reflect the lower variable pay awards.

Note that compensation paid in 2022 for former EC members is not included in Compensation Exhibit 5. This can be found in Compensation Exhibit 38.

Compensation elements - 2022 highlights

Base salary

The salaries of the EC members have been reviewed as part of the regular compensation review. As a result, the Board and the CC decided to increase the salaries of five of the nine EC members in place in March 2022. The base salary of Björn Rosengren was increased by 5.0 percent to CHF 1,785,000, Timo Ihamuotila by 2.1 percent to CHF 990,000, Carolina Granat by 3.6 percent to CHF 725,000, Peter Terwiesch by 3.8 percent to CHF 830,000 and Morten Wierod by 12.5 percent to CHF 900,000. These salary changes were made to reward exceptional performance of these EC members, ensure their total compensation opportunity does not fall behind their relevant target market position, and in the case of Morten Wierod, to reflect a broadening of responsibilities.

Considering that the other four EC members in place in March 2022 had no salary adjustments, this corresponded to a 3.25 percent increase on annual base salaries for the EC members post March 2022.

Annual Incentive Plan (AIP) - design

Under the AIP, all members of the EC had a common Group measure, with a 20 to 25 percent weighting. In 2022, this was Group Operational EBITA margin, applied to create a greater focus on profitability.

In addition to the common Group measure, the CEO and the Corporate Officers shared the same Group measures, including Revenues, Free Cash Flow and Productivity growth, with a total weighting of 55 percent.

For Business Area Presidents, up to three measures were tailored to business imperatives, with a total weighting of 60 percent. While all Business Area Presidents shared one measure (Operational EBITA margin, with 25 to 30 percent), the second and third measure varied, including Productivity growth, Revenues, Operational Free Cash Flow, Order Gross Margin and Operational revenues gross profit productivity growth, for the remaining 25 to 30 percent.

Compensation Exhibit 22 below shows the composition and weighting of the financial measures applied in 2022 for all EC members under their AIP, specified by their roles. Definitions of the financial measures applied for all EC members are set out in the Compensation Exhibit 23.

Compensation Exhibit 22: Composition and weighting of 2022 AIP measures for EC members

	Focus of measure	CEO and Corporate Officers ⁽¹⁾	President Electrification	President Motion	President Process Automation	President Robotics & Discrete Automation
Common Group financial measure	Bottom line earnings	Op EBITA margin 25%	Op EBITA margin 20%	Op EBITA margin 20%	Op EBITA margin 20%	Op EBITA margin 20%
Other Group financial measures	Top line output	Revenues 25%				
	Cash generation	Free Cash Flow 20%				
	Bottom line output	Productivity growth 10%				
Business Area financial measures	Bottom line earnings		Op EBITA margin 30%	Op EBITA margin 25%	Op EBITA margin 30%	Op EBITA margin 30%
	Cash generation		Op Free Cash Flow 20%			
	Top line input			Revenues 25%		Revenues 20%
	Bottom line profit				Order Gross Margin 20%	
	Bottom line output				Operational revenues gross profit productivity growth 10%	
	Bottom line output		Productivity growth 10%	Productivity growth 10%		Productivity growth 10%
Individual measure	CO ₂ emissions, Female leaders, Cost discipline, Safety, Strategy implementation, Internal controls	Function-specific 20%				
	CO ₂ emissions, Safety, Female graduate recruitment, M&A, Digital revenue growth, Strategy implementation		Business-specific 20%	Business-specific 20%	Business-specific 20%	Business-specific 20%
Total		100%	100%	100%	100%	100%

(1) Corporate Officers include Chief Financial Officer, Chief Human Resources Officer, General Counsel and Chief Communications and Sustainability Officer.

Compensation Exhibit 23: Definition of quantitative measures, applied in 2022	
Measure	Description
Operational EBITA margin (%)	Operational EBITA, which is Operational earnings before interest, tax and acquisition-related amortization, as a percentage of Operational revenues, which is total revenues adjusted for foreign exchange/commodity timing differences in total revenues
Revenues	Amount of consolidated revenues recognized during the year in accordance with USGAAP
Free Cash Flow (FCF)	Free Cash Flow is calculated as net cash provided by operating activities adjusted for: (i) purchases of property, plant and equipment and intangible assets, and (ii) proceeds from sales of property, plant and equipment
Productivity growth (%)	Productivity is calculated as 12-month rolling revenues over the average number of total workforce in the last three months. Growth is the change of productivity over the same period a year earlier, represented as a percentage change
Operational Free Cash Flow (OFCF)	Cash flows from operating activities excluding cash paid for interest and taxes and including (i) purchases of property, plant and equipment and intangible assets, and (ii) proceeds from sales of property, plant and equipment
Order Gross Margin (%)	Gross profit on orders (calculated by deducting total costs to complete the order from the total revenue value of the order) divided by the total revenue values of the order as calculated in the final contract offering to the customer
Operational revenues gross profit productivity growth (%)	Operational revenues gross profit productivity is calculated as the 12-month rolling operational revenues gross profit divided by the average number of total workforce in the last three months. Where operational revenues gross profit is calculated as gross profit (as defined under USGAAP) adjusted for the following non-operational items to the extent that they are included within the USGAAP gross profit amount: (i) foreign exchange/commodity timing differences, (ii) acquisition-related amortization, (iii) restructuring, related and implementation costs, (iv) changes in obligations related to divested businesses, (v) changes in pre-acquisition estimates, (vi) acquisition- and divestment-related expenses and integration costs, (vii) other income/expense relating to the Power Grids joint venture and (viii) certain other non-operational items. Growth is the change in productivity over the same period a year earlier, represented as a percentage change

All EC members also had an individual measure with a 20 percent weighting. This individual component was informed by up to three goals, which included a combination of quantitative and qualitative goals. From 2022, at least two of these goals relate to sustainability, e.g., GHG emissions, safety or female leader targets. The final outcome against the individual measure was based on a discretionary judgment of the combined performance against all three goals.

- In 2022, all EC members had a common environmental goal – namely the reduction of GHG emissions. For the CEO and the Corporate Officers, this related to Group level and for Business Area Presidents to their respective Business Areas.
- For the CEO and Corporate Officers, the other goals were linked to the level of Female leaders, Cost discipline, Safety, Strategy implementation, or Internal controls.
- Business Area Presidents continued to have a safety goal. Their other goals related to Female graduate recruitment, M&A, Digital revenue growth, or Strategy implementation.

Outcomes were subject to appropriate adjustments for some non-operational items and other adjustment principles agreed with the Board.

2022 Annual Incentive Plan - achievements

The average award for the current EC members under the AIP for 2022 was 118.3 percent (out of a maximum 150 percent), compared to 143.4 percent in 2021. The 2022 AIP outcomes were net of the application of adjustments for some non-operational items, aligned with adjustment principles agreed with the Board. These led to adjustments of awards for three EC members, ranging from a five percent decrease to a 15 percent increase of awards.

Common Group measure

Achievement against the 2022 Group Operational EBITA margin measure, which applied to all EC members, with a weighting of 20 percent for the Business Areas Presidents and 25 percent for the CEO and Corporate Officers, was 150 percent (2021: 150 percent). Therefore the weighted achievement related to the common Group measure was 30.0 percent for the Business Area Presidents, and 37.5 percent for the CEO and the Corporate Officers.

Other Group measures

The outcome related to the other three Group measures, applied to the CEO and Corporate Officers, was at 95.5 percent. Achievement against the Group Revenue target, with a 25 percent weighting, was 150 percent (2021: n.a.). Achievement against of the Free Cash Flow target, with a weighting of 20 percent, was zero percent (2021: 150 percent). Achievement against the Productivity growth target, with a weighting of 10 percent, was 150 percent (2021: 150 percent). Therefore the compound achievement related to these three Group measures was 52.5 percent.

Business Area measures

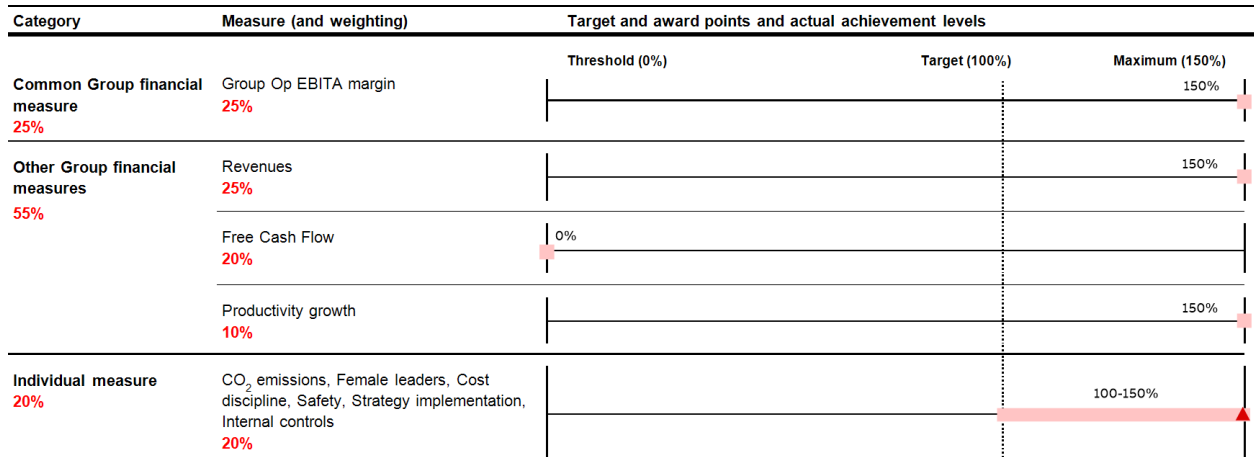
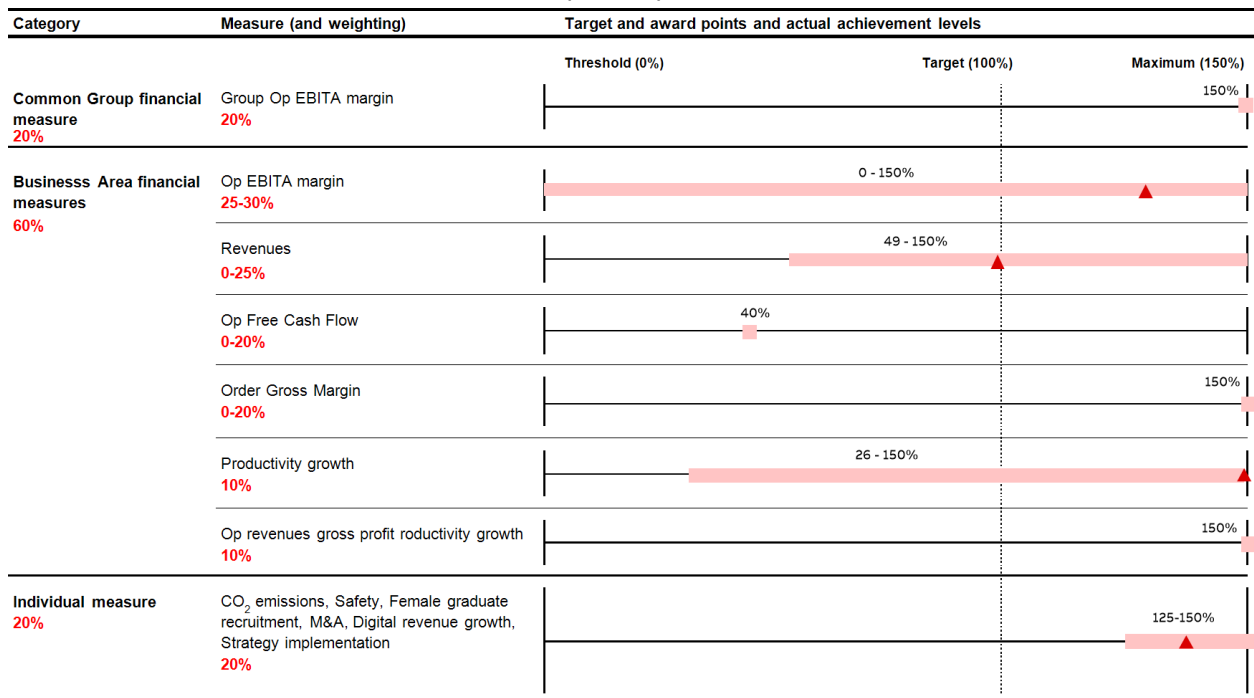
Up to three quantitative business measures were applied to the Business Area Presidents, with weightings from 10 to 30 percent, and the outcomes ranged from zero to 150 percent of target (2021: 119 to 150 percent).



Achievement against the Operational EBITA margin measure ranged from zero to 150 percent for all Business Areas (2021: 119 to 150 percent), Revenues 49.1 to 150 percent for the two Business Areas applicable (2021: n.a.), Operational Free Cash Flow 40.5 percent (2021: 150 percent), Order Gross Margin 150 percent (2021: n.a.), Productivity growth zero to 150 percent for three Business Areas applicable (2021: 150 percent) and Operational revenues gross profit productivity growth 150 percent (2021: n.a.). Therefore the compound weighted achievement related to these Business Area measures ranged from 12.4 to 90.0 percent (2021: 80.8 to 90.0 percent).

Individual measure

The assessed achievement of the goals informing the outcome of the individual component for EC members, with a weighting of 20 percent, inclusive of the achievement of the sustainability goals (Safety, Female leader and emissions targets), ranged from 100 to 150 percent (2021: 100 to 150 percent).

These outcomes are summarized in Compensation Exhibit 24.

Compensation Exhibit 24: 2022 AIP outcomes for the CEO and the Corporate Officers (rounded)

2022 AIP outcomes for the Business Area Presidents (rounded)


 Actual achievement (dot) or range of actual achievements (line between minimum and maximum dot)
 Median achievement of the applicable range

Overall outcomes

The overall average award under the 2022 AIP for the entire current EC was 118.3 percent of target (2021: 143.4 percent) with a range from 67.4 percent (lowest achievement) to 150 percent of target (highest achievement). This compared to a range of 140.0 to 145.0 percent in 2021.

Compensation Exhibit 25 below provides information related to the overall actual 2022 AIP outcomes, in comparison to the target 2022 AIP for all current EC members.

Compensation Exhibit 25: Overview of targeted and realized 2022 AIP values

	Common Group measure			Other Group measures			Business Area measures			Individual measure			Total AIP outcome percentage (in % of target)	Target AIP award (in CHF)	Actual AIP award (in CHF) ⁽³⁾
	Achievement	Weighting	Outcome	Achievement	Weighting	Outcome	Achievement	Weighting	Outcome	Achievement	Weighting	Outcome			
Björn Rosengren	150.0%	25.0%	37.5%	95.5%	55.0%	52.5%	n.a.	n.a.	n.a.	150.0%	20.0%	30.0%	120.0%	1,785,000	2,142,000
Timo Ihamuotila	150.0%	25.0%	37.5%	95.5%	55.0%	52.5%	n.a.	n.a.	n.a.	150.0%	20.0%	30.0%	120.0%	990,000	1,188,000
Carolina Granat	150.0%	25.0%	37.5%	95.5%	55.0%	52.5%	n.a.	n.a.	n.a.	150.0%	20.0%	30.0%	120.0%	725,000	870,000
Andrea Antonelli ⁽¹⁾	150.0%	25.0%	37.5%	95.5%	55.0%	52.5%	n.a.	n.a.	n.a.	125.0%	20.0%	25.0%	115.0%	583,334	670,833
Karin Lepasoon ⁽²⁾	150.0%	25.0%	37.5%	95.5%	55.0%	52.5%	n.a.	n.a.	n.a.	100.0%	20.0%	20.0%	110.0%	150,000	165,000
Sami Atiya	150.0%	20.0%	30.0%	n.a.	n.a.	n.a.	20.6%	60.0%	12.4%	125.0%	20.0%	25.0%	67.4%	800,000	539,200
Tarak Mehta	150.0%	20.0%	30.0%	n.a.	n.a.	n.a.	139.7%	60.0%	83.8%	150.0%	20.0%	30.0%	143.8%	930,000	1,337,340
Peter Terwiesch	150.0%	20.0%	30.0%	n.a.	n.a.	n.a.	150.0%	60.0%	90.0%	150.0%	20.0%	30.0%	150.0%	830,000	1,245,000
Morten Wierod	150.0%	20.0%	30.0%	n.a.	n.a.	n.a.	106.0%	60.0%	63.6%	125.0%	20.0%	25.0%	118.6%	900,000	1,067,400
Total														7,693,334	9,224,773

(1) EC member as of March 1, 2022. Target and Actual AIP awarded are prorated for the time employed in year 2022.

(2) EC member as of October 1, 2022. Target and Actual AIP awarded are prorated for the time employed in year 2022.

(3) Represents accrued AIP award for the year 2022, which will be paid in 2023, after the publication of ABB's financial results.

Long-Term Incentive (LTIP)

2022 LTIP grants

The estimated value at grant of the share-based grants to EC members under the 2022 LTIP was CHF 8.6 million, compared with CHF 8.7 million in 2021.

The reference price for the 2022 LTIP grant which was used to determine the number of shares granted to participants was CHF 32.48.

The 2022 LTIP is based on three performance measures: ABB's EPS, ABB's TSR and a sustainability measure.

Targets and award points under the EPS measure are considered as commercially sensitive information and will only be disclosed retrospectively after the end of the relevant LTIP performance period.

As in the previous year, ABB made the achievement of the EPS threshold point more challenging by further decreasing the range between the EPS target and award points (range reduced from plus/minus 14 percent of target for 2021 LTIP to plus/minus 11 percent of target for the 2022 LTIP) to reflect the perceived EPS volatility during the performance period.

The peer companies approved by the Board to determine ABB's relative TSR performance for the 2022 LTIP were: 3M, Danaher, Eaton, Emerson Electric, General Electric, Honeywell Intl., Holcim, Legrand, Mitsubishi Electric, Raytheon Technologies, Rockwell, Rolls Royce, Schneider Electric, Siemens and Yokogawa. These were selected as they are comparable in their size, scope and complexity to ABB and compete in markets that are key to ABB. They also provide an appropriate and very challenging set of peers, and influenced the vesting point setting accordingly.

For 2022, the sustainability measure was the Company's scope 1 and 2 GHG emissions reduction at the end of the three-year performance period (2022-2024), compared to the 2019 baseline, which was defined without the divested Power Grids business. The approved sustainability target and award points for the 2022 LTIP are illustrated in Compensation Exhibit 26 below.

Compensation Exhibit 26: Sustainability target and award points for the 2022 LTIP

Measure	Weighting	Threshold	Target	Maximum
ABB scope 1&2 CO ₂ equivalent emissions reduction compared to 2019 baseline	20%	60%	70%	80%

Below threshold point: no award;
At target point: 100 percent award;
At or above maximum point: capped at 200 percent award;
Linear interpolations between award points.

The 2022 LTIP target and award points are illustrated in Compensation Exhibit 27.

Compensation Exhibit 27: 2022 LTIP target and award points

Measure	Weighting	Threshold	Target	Maximum
Average EPS	50%	Target point -11%	Disclosed after performance period	Target point +11%
Relative TSR	30%	50th percentile		75th percentile
Reduction of scope 1&2 CO ₂ equivalent emissions compared to 2019 baseline	20%	60.0%	70.0%	80.0%

Below threshold point: no award;
At target point: 100 percent award;
At or above maximum point: capped at 200 percent award;
Linear interpolations between award points;
The average EPS target is not prospectively disclosed for reasons of commercial sensitivity.

2023 LTIP grants

The sustainability measure applied to the 2022 LTIP will also be applied in 2023, namely the scope 1 and 2 GHG emissions reduction at the end of the three-year performance period (2023-2025), compared to the 2019 baseline. Details of the long-term GHG emissions reduction targets can be found in ABB's Item 4. Information on the Company—Sustainability activities.

The targets and award points have been structured to reflect ABB's progress to date, its long-term ambitions, and that as the targets get higher, the overall stretch to achieve them is even more challenging.

- The threshold value of 75.0 percent emissions reduction versus the 2019 baseline is significantly above the mid-term target of 70 percent proposed at the 2023 AGM.
- The target value of 77.5 percent is in line with ABB's long-term forecast for 2025.
- The maximum value of 80.0 percent is in line with our 2030 Sustainability Strategy target. If it is achieved in 2025, it would mean we have delivered our target five years ahead of our commitment.

Compensation Exhibit 28: Sustainability target and award points for the 2023 LTIP

Measure	Weighting	Threshold	Target	Maximum
ABB scope 1&2 CO ₂ equivalent emissions reduction compared to 2019 baseline	20%	75.0%	77.5%	80.0%

Below threshold point: no award;
At target point: 100 percent award;
At or above maximum point: capped at 200 percent award;
Linear interpolations between award points.

2019 LTIP - achievements

The final number of shares vesting under the 2019 LTIP grant in 2022 was determined based on the achievement level against the predefined TSR and EPS targets.

The relative ranking of ABB's TSR measure against the predefined peer group of companies for the 2019 LTIP sat on the 86th percentile, which led to a vesting level of 200.0 percent (previous year: 114.8 percent) out of a potential of 200 percent.

The three-year average EPS amounted to USD 0.86, which led to a vesting level of 42.0 percent (previous year: zero percent) out of a potential 200 percent, net of adjustments for items considered outside the normal course of business operation and/or which were not considered in the target setting of the 2019 LTIP. On this occasion, adjustments were made for the impact of divestments, M&A related integration costs and restructuring costs.

In line with our commitment to retrospectively disclose the EPS performance targets for vested LTIP awards, the three target and award points (threshold, target and maximum) and the actual achievement for the adjusted 2019 EPS performance measure are shown in Compensation Exhibit 29 below.

The average weighted achievement level of the two performance measures under the 2019 LTIP was 121.0 percent (out of a maximum 200 percent), as specified in Compensation Exhibit 29.

Compensation Exhibit 29: Target and award points and achievement levels of 2019 LTIP performance measures					
Measure	Weighting	Threshold	Target	Maximum	Actual
Relative TSR	50%	25 th percentile	50 th percentile	75 th percentile	86 th percentile
Achievement level		0%	100%	200%	200.0%
Average EPS (USD)	50%	0.75	1.00	1.25	0.86
Achievement level		0%	100%	200%	42.0%
Award as percentage of target (capped at 200%)					121.0%

Overview of disclosed and realized 2019 LTIP value

The following table compares the previously disclosed "fair value" of the grant to each EC member and the actual value of the grant at the time of vesting. The following Compensation Exhibit 30 shows such comparison for the 2019 LTIP, that vested in 2022.

Compensation Exhibit 30: Realized value of 2019 LTIP grant for current EC members

	Grant date	Number of shares granted related to the TSR measure ⁽¹⁾	Shares granted related to the EPS measure ⁽²⁾	Total number of shares granted	Disclosed grant fair value (CHF) ⁽³⁾	Vesting date	Vesting percentage	Number of vested shares	Realized value (CHF) ⁽⁴⁾
Björn Rosengren	n.a.					n.a.			
Timo Ihamuotila	May 16, 2019	24,536	24,535	49,071	836,661	May 16, 2022	121.0%	59,377	1,680,963
Carolina Granat	n.a.					n.a.			
Andrea Antonelli	n.a.					n.a.			
Karin Lepasoon	n.a.					n.a.			
Sami Atiya	May 16, 2019	24,794	24,793	49,587	845,459	May 16, 2022	121.0%	60,002	1,698,657
Tarak Mehta	May 16, 2019	22,211	22,211	44,422	757,396	May 16, 2022	121.0%	53,751	1,521,691
Peter Terwiesch	May 16, 2019	20,662	20,661	41,323	704,559	May 16, 2022	121.0%	50,002	1,415,557
Morten Wierod	May 16, 2019	18,079	18,079	36,158	616,494	May 16, 2022	121.0%	43,752	1,238,619
Total					3,760,569				7,555,487

(1) Actual achievement level of the TSR measure was 200.0 percent.

(2) Actual achievement level of the EPS measure was 42.0 percent.

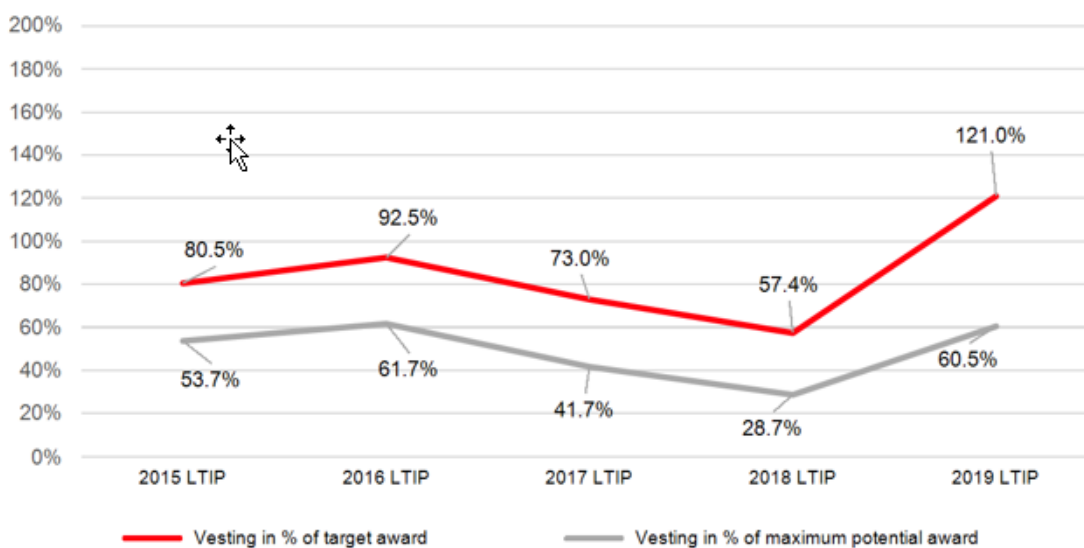
(3) Valued at CHF 17.05, the grant fair value of the ABB share on the day of grant.

(4) Valued at CHF 28.31, the closing price of the ABB share on the day of vesting.

The values presented are gross and before payment of any applicable taxes owing by the recipient. This indicates the average gross realized LTIP value was 200.9 percent of the disclosed grant fair value.

LTIP vesting outcomes in the last five years

The historical LTIP vesting outcomes for the prior five years are shown in Compensation Exhibit 31 below. Over the last five years vesting has averaged at 84.9 percent of target and 49.3 percent of the maximum award.

Compensation Exhibit 31: LTIP historical actual vesting percentages⁽¹⁾


(1) According to plan-specific relative weighting of relevant performance measures.

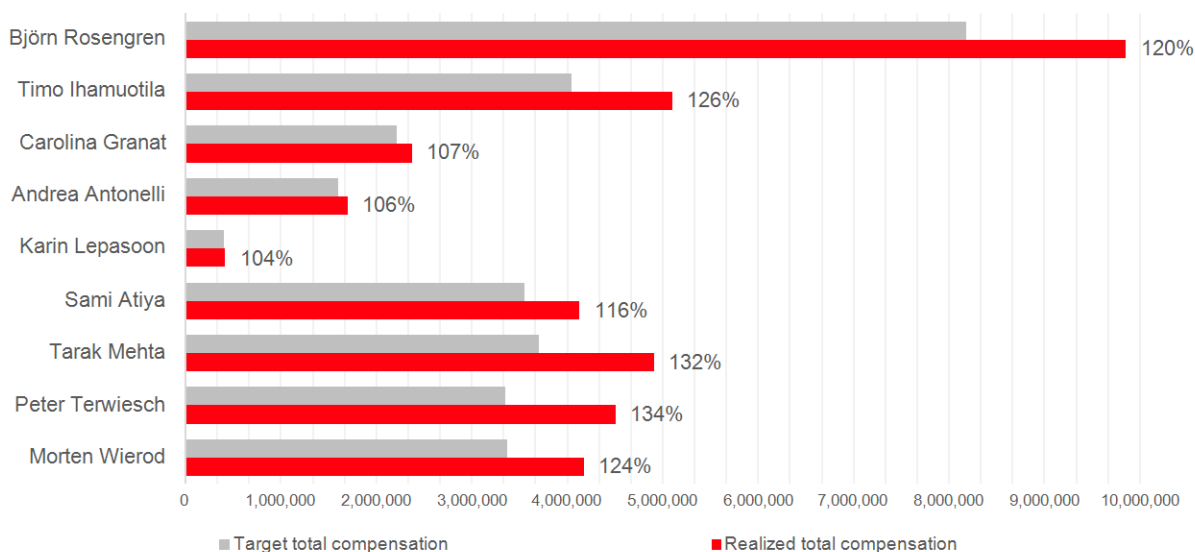
Realized total compensation - 2022

We disclose the realized total compensation for each EC member. Realized compensation relates to the AIP award and the LTIP award at the end of their respective performance cycles, reflecting actual payment and settlement, based on achievements of the plan specific performance measures.

Such transparency on realized compensation is designed to aid stakeholder's understanding of ABB's link between pay and performance.

The following Compensation Exhibit 32 sets out a high-level comparison of realized and target total compensation for each EC member. A detailed summary table is given in Compensation Exhibit 44 in the section "Compensation tables and share ownership tables".

Compensation Exhibit 32: Realized 2022 total compensation (in CHF) compared to target total compensation



Other compensation - 2022

Members of the EC are eligible to participate in the Employee Share Acquisition Plan (ESAP), a savings plan based on stock options, which is open to employees around the world. Five members of the EC participated in the 19th annual ESAP launch of the plan in 2022. EC members who participated will, upon vesting, each be entitled to acquire up to 360 ABB shares at CHF 27.99 per share, the market share price at the start of the 2022 launch.

For a more detailed description of the ESAP, please refer to "Note 18 – Share-based payment arrangements" in our Consolidated Financial Statements.

In 2022, ABB did not pay any fees or compensation to the members of the EC for services rendered to ABB other than those disclosed in this report. Except as disclosed in the section "Executive Committee – Business relationships between ABB and its EC members" in "Item 6. Directors, Senior Management and Employees", the Company did not pay any additional fees or compensation in 2022 to persons closely linked to a member of the EC for services rendered to ABB.

Shareholding of EC members

Four out of nine EC members have exceeded their share ownership requirement. Two further members are close to achieving their requirement, while three members have been newly appointed to the EC in the last two years. The individual shareholding in comparison to the relevant ownership requirement is shown in Compensation Exhibit 9 in the section "Compensation at a glance".

The EC members collectively owned less than 1 percent of ABB's total shares outstanding at December 31, 2022.

At December 31, 2022, EC members held ABB shares and conditional rights to receive shares, as shown in Compensation Exhibit 42 in the section "Compensation tables and share ownership tables" below. Their holdings at December 31, 2021, are shown in Compensation Exhibit 43 in the same section.

As previously communicated, as from 2020, grants under the Management Incentive Plan (MIP), a stock option plan without performance conditions, have been discontinued, and no further grants were made. Any MIP instruments held by EC members were awarded prior to their appointment as EC members. For a more detailed description of MIP, please refer to "Note 18 – Share-based payment arrangements" in our Consolidated Financial Statements.

Except as described in Compensation Exhibits 42 and 43, no member of the EC and no person closely linked to a member of the EC held any shares of ABB or options on ABB shares at December 31, 2022, and 2021.

Accelleron equity restoration

In October 2022, ABB shareholders received a dividend in kind in Accelleron shares at the spin-off date. Granted but unvested, Performance Share Units (PSU) and Restricted Share Units (RSU) held by ABB employees at the time of the spin-off date, including members and former members of the EC, were not entitled to receive the dividend in kind distribution.

As contemplated by the terms of the LTIP rules, to ensure equal treatment of PSU and RSU holders relative to ABB shareholders, ABB increased the previously granted number of shares by 3.7 percent to reflect the impact of the Accelleron spin-off, to ensure that ABB employees including EC members are not disadvantaged by the spin-off relative to ABB shareholders.

The total value related to the additional shares granted for the EC was CHF 0.9 million. The amount was equivalent to the estimated reduction in value of the ABB share as a result of the dividend in kind related to the spin-off and as such are not considered by the CC to be additional compensation.

Changes applicable to EC members

Terms of appointment for new EC members

The new General Counsel & Company Secretary, Andrea Antonelli, was appointed to the EC effective from March 1, 2022, with an annual base salary of CHF 700,000, a target short-term incentive of 100 percent of annual base salary and a target long-term incentive of 150 percent of annual base salary. Andrea Antonelli is eligible for standard EC benefits as per the policy announced in last year's report.

The new Chief Communications & Sustainability Officer (CCSO), Karin Lepasoon, was appointed to the EC effective from October 1, 2022, with an annual base salary of CHF 600,000, a target short-term and target long-term incentive of 100 percent of annual base salary respectively. Karin Lepasoon is eligible for standard EC benefits as per the policy announced in last year's report and received standard relocation benefits.

Terms of departure for EC members

The previous General Counsel & Company Secretary, Maria Varsellona, resigned from ABB and departed on March 31, 2022. She received compensation and benefits up to the point of her departure. This includes a contractually agreed pro-rata short-term incentive payment of CHF 181,985 for the period January 1 to March 31, 2022. All her unvested LTIP share grants and the unvested second tranche of her replacement share grant were forfeited.

The previous CCSO, Theodor Swedjemark, resigned from ABB and stepped down from the EC as per October 31, 2022. He will depart from ABB on February 28, 2023. He is entitled to receive compensation and benefits up to the point of his departure. This includes a contractually agreed short-term incentive payment of CHF 473,124 for 2022 and a pro-rata short-term incentive payment of CHF 78,854 for the period January 1 to February 28, 2023. All his unvested LTIP share grants were forfeited.

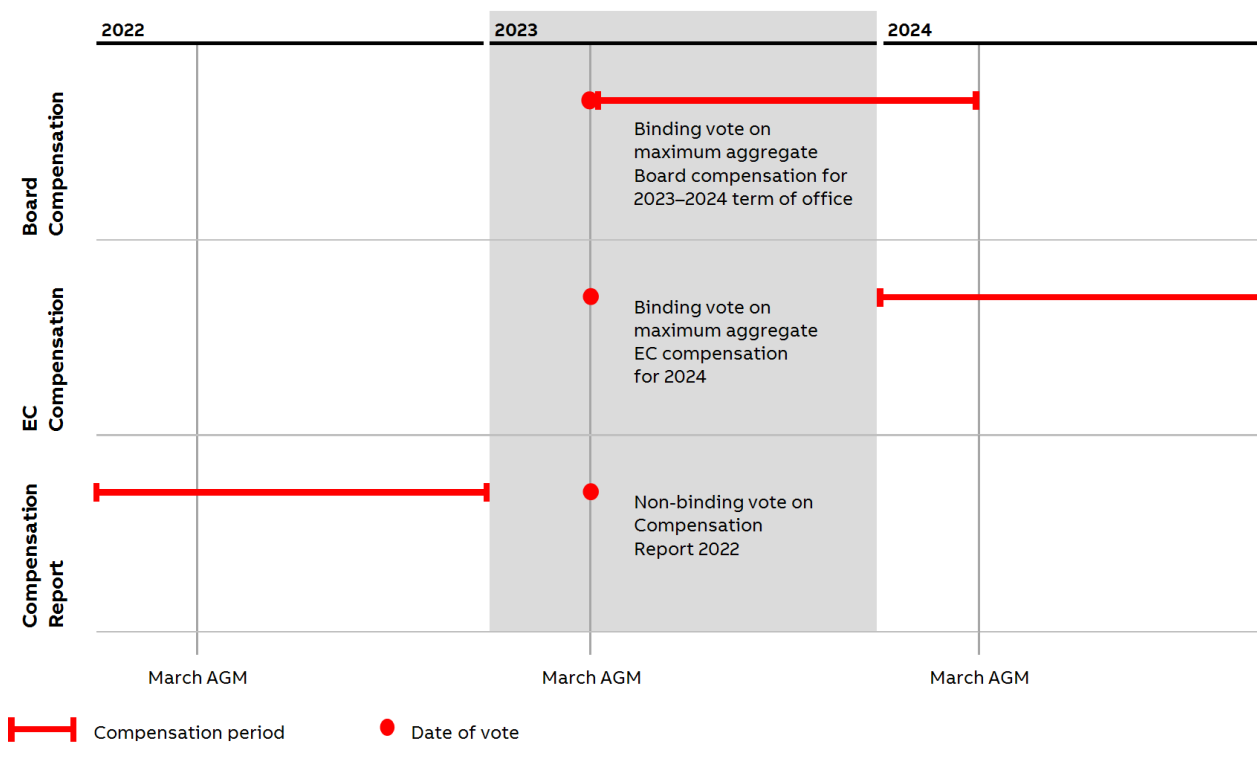
Compensation of former EC members

In 2022, certain former EC members received contractual compensation for the period after leaving the EC, as shown in Compensation Exhibit 38, footnote (5).

Votes on compensation at the 2023 AGM

As illustrated in Compensation Exhibit 33, the Board's proposals to shareholders at the 2023 AGM will relate to Board compensation for the 2023–2024 term of office and EC compensation for the calendar year 2024. There will also be a non-binding consultative vote on the Compensation Report 2022.

Compensation Exhibit 33: Shareholders will have three separate votes on compensation at the 2023 AGM



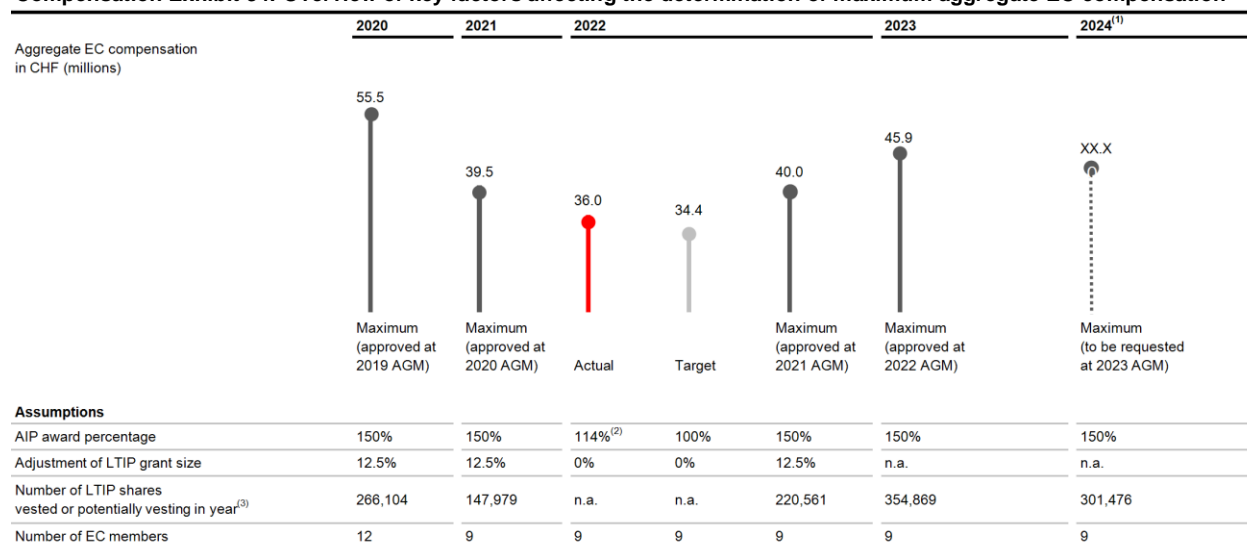
The voting results at ABB's past AGM in 2022 were as follows:

- Maximum aggregate Board compensation for the 2022–2023 term of office – 99.08 percent
- Maximum aggregate EC compensation for 2023 – 92.32 percent
- Consultative vote on the Compensation Report 2021 – 91.32 percent

In determining the proposed maximum aggregate EC compensation for 2024, the Board takes into consideration the criteria illustrated in Compensation Exhibit 34. Given the variable nature of a major portion of the compensation components, the proposed maximum aggregate EC compensation will almost normally be higher than the actual compensation paid or awarded, as it must cover the potential maximum value of each component of compensation.

The decrease in maximum aggregate EC compensation for 2024 compared to 2023 is mainly influenced by the potential vesting related costs from the 2021 LTIP award, as well as the lower compensation levels applied to new EC members compared to plan.

Compensation Exhibit 34: Overview of key factors affecting the determination of maximum aggregate EC compensation



(1) Figure will be provided in the AGM invitation.

(2) Outcome without the allocation of former EC members, but including previous General Counsel & Company Secretary and previous CCSO. For a full description, see previous section "Compensation elements – 2022 highlights".

(3) For example, 301,476 LTIP shares were granted in 2021 that potentially vest in 2024, subject to performance conditions.

Compensation tables and share ownership tables

Compensation Exhibit 35: Board compensation in 2022 and 2021

Name	Paid in 2022					Paid in 2021				
	November Board term 2022-2023		May Board term 2021-2022		Total compensation paid in 2022 ⁽³⁾	November Board term 2021-2022		May Board term 2020-2021		Total compensation paid in 2021 ⁽³⁾
	Settled in cash ⁽¹⁾	Settled in shares - number of shares received ⁽²⁾	Settled in cash ⁽¹⁾	Settled in shares - number of shares received ⁽²⁾		Settled in cash ⁽¹⁾	Settled in shares - number of shares received ⁽²⁾	Settled in cash ⁽¹⁾	Settled in shares - number of shares received ⁽²⁾	
	CHF		CHF		CHF	CHF		CHF		CHF
Peter Voser, Chairman ⁽⁴⁾	—	21,565	—	18,296	1,200,000	—	17,209	—	20,089	1,200,000
Jacob Wallenberg ⁽⁵⁾	112,500	3,257	112,500	2,763	450,000	112,500	2,599	112,500	3,033	450,000
Matti Alahuhta ⁽⁶⁾	—	—	—	—	—	—	—	—	3,615	160,000
Gunnar Brock ⁽⁷⁾	82,500	2,388	82,500	2,026	330,000	82,500	1,906	—	4,542	330,000
David Constable ⁽⁸⁾	80,000	2,316	80,000	1,964	320,000	80,000	1,848	87,500	2,359	335,000
Frederico Curado ⁽⁹⁾	—	4,799	—	4,075	350,000	—	3,829	—	4,090	335,000
Lars Förberg ⁽¹⁰⁾	—	5,736	—	4,870	320,000	—	4,577	—	5,347	320,000
Jennifer Xin-Zhe Li ⁽¹¹⁾	87,500	2,338	87,500	1,986	350,000	87,500	1,866	80,000	1,993	335,000
Geraldine Matchett ⁽¹²⁾	82,500	3,121	82,500	2,647	330,000	82,500	2,490	82,500	2,906	330,000
David Meline ⁽¹³⁾	100,000	2,895	100,000	2,456	400,000	100,000	2,310	100,000	2,696	400,000
Satish Pai ⁽¹⁴⁾	—	4,523	82,500	1,872	330,000	82,500	1,759	82,500	2,055	330,000
Total	545,000	52,938	627,500	42,955	4,380,000	627,500	40,393	545,000	52,725	4,525,000

(1) Represents gross amounts paid, prior to deductions for social security, withholding tax etc.

(2) Number of shares per Board member is calculated based on net amount due after deductions for social security, withholding tax etc.

(3) In addition to the Board remuneration stated in the above table, in 2022 and 2021 the Company paid CHF 248,489 and CHF 231,287, respectively, in related mandatory social security payments.

(4) Chairman of the ABB Ltd Board for the 2020-2021, 2021-2022 and 2022-2023 board terms and Chairman of the Governance and Nomination Committee for the 2021-2022 and 2022-2023 board terms; is receiving 100 percent of his compensation in the form of ABB shares.

(5) Vice-Chairman of the ABB Ltd Board for the 2020-2021, 2021-2022 and 2022-2023 board terms; Chairman of the Governance and Nomination Committee for the 2020-2021 board term and member of that committee for the 2021-2022 and 2022-2023 board terms; is receiving 50 percent of his compensation in the form of ABB shares.

(6) Member of the Governance and Nomination Committee for the 2020-2021 board term; received 100 percent of his compensation in the form of ABB shares for the 2020-2021 board term. Did not stand for election in 2021.

(7) Member of the Finance, Audit and Compliance Committee for the 2020-2021, 2021-2022 and 2022-2023 board terms; received 100 percent of his compensation in the form of ABB shares for the 2020-2021 board term and is receiving 50 percent of his compensation in the form of ABB shares for the 2021-2022 and 2022-2023 board terms.

(8) Chairman of the Compensation Committee for the 2020-2021 board term and member of that committee for the 2021-2022 and 2022-2023 board terms; is receiving 50 percent of his compensation in the form of ABB shares.

(9) Member of the Compensation Committee for the 2020-2021 board term and Chairman of that committee for the 2021-2022 and 2022-2023 board terms; is receiving 100 percent of his compensation in the form of ABB shares.

(10) Member of the Governance and Nomination Committee for the 2020-2021, 2021-2022 and 2022-2023 board terms; is receiving 100 percent of his compensation in the form of ABB shares.

(11) Member of the Compensation Committee for the 2020-2021, 2021-2022 and 2022-2023 board terms and member of the Governance and Nomination Committee for the 2021-2022 and 2022-2023 board terms; is receiving 50 percent of her compensation in the form of ABB shares.

(12) Member of the Finance, Audit and Compliance Committee for the 2020-2021, 2021-2022 and 2022-2023 board terms; is receiving 50 percent of her compensation in the form of ABB shares.

(13) Chairman of the Finance, Audit and Compliance Committee for the 2020-2021, 2021-2022 and 2022-2023 board terms; is receiving 50 percent of his compensation in the form of ABB shares.

(14) Member of the Finance, Audit and Compliance Committee for the 2020-2021, 2021-2022 and 2022-2023 board terms; received 50 percent of his compensation in the form of ABB shares for the 2020-2021 and 2021-2022 board terms and is receiving 100 percent of his compensation in the form of ABB shares for the 2022-2023 board term.

Compensation Exhibit 36: Board compensation for the Board terms 2022-2023 and 2021-2022

Name	Specific Board roles	Board term 2022-2023	Board term 2021-2022
		CHF	CHF
Peter Voser	Chairman of the Board and Chairman GNC for 2021-2022 and 2022-2023 terms	1,200,000	1,200,000
Jacob Wallenberg	Vice-Chairman of the Board and Member GNC for 2021-2022 and 2022-2023 terms	450,000	450,000
Gunnar Brock	Member FACC for 2021-2022 and 2022-2023 terms	330,000	330,000
David Constable	Member CC for 2021-2022 and 2022-2023 terms	320,000	320,000
Frederico Curado	Chairman CC for 2021-2022 and 2022-2023 terms	350,000	350,000
Lars Förberg	Member GNC for 2021-2022 and 2022-2023 terms	320,000	320,000
Jennifer Xin-Zhe Li	Member CC and Member GNC for 2021-2022 and 2022-2023 terms	350,000	350,000
Geraldine Matchett	Member FACC for 2021-2022 and 2022-2023 terms	330,000	330,000
David Meline	Chairman FACC for 2021-2022 and 2022-2023 terms	400,000	400,000
Satish Pai	Member FACC for 2021-2022 and 2022-2023 terms	330,000	330,000
Total		4,380,000	4,380,000

Key:

CC: Compensation Committee

FACC: Finance, Audit and Compliance Committee

GNC: Governance and Nomination Committee

Compensation Exhibit 37: Board ownership of ABB shares

Name	Total number of shares held	
	December 31, 2022	December 31, 2021
Peter Voser ⁽¹⁾	231,807	191,946
Jacob Wallenberg	245,898	239,878
Gunnar Brock	37,813	33,399
David Constable	42,465	38,185
Frederico Curado	49,175	40,301
Lars Förberg	70,522	59,916
Jennifer Xin-Zhe Li	41,904	37,580
Geraldine Matchett	30,964	25,196
David Meline ⁽²⁾	43,131	37,780
Satish Pai	34,827	28,432
Total	828,506	732,613

(1) Includes 2,000 shares held by the spouse.

(2) Includes 3,150 shares held by the spouse.

Compensation Exhibit 38: EC compensation in 2022

Name	Cash Compensation					Estimated value of share-based grants under the LTIP in 2022 ⁽⁴⁾	2022 Total compensation (incl. conditional share-based grants) ⁽⁵⁾
	Base salary	Short-term incentive ⁽¹⁾	Pension benefits	Other benefits ⁽²⁾	2022 Total cash-based compensation ⁽³⁾		
	CHF	CHF	CHF	CHF	CHF	CHF	CHF
Björn Rosengren	1,770,840	2,142,000	762,478	988,084	5,663,402	2,411,254	8,074,656
Timo Ihamuotila	986,672	1,188,000	527,648	720,953	3,423,273	891,570	4,314,843
Carolina Granat	720,843	870,000	427,903	352,848	2,371,594	652,920	3,024,514
Andrea Antonelli (EC member as of March 1, 2022)	583,334	670,833	198,164	245,754	1,698,085	945,595	2,643,680
Karin Lepasoon (EC member as of October 1, 2022)	150,000	165,000	62,360	38,987	416,347	540,336	956,683
Sami Atiya	800,009	539,200	487,247	599,994	2,426,450	747,485	3,173,935
Tarak Mehta	930,009	1,337,340	513,481	604,563	3,385,393	837,546	4,222,939
Peter Terwiesch	825,001	1,245,000	485,152	536,952	3,092,105	747,485	3,839,590
Morten Wierod	875,006	1,067,400	471,432	523,912	2,937,750	810,519	3,748,269
Total Executive Committee members at December 31, 2022	7,641,714	9,224,773	3,935,865	4,612,047	25,414,399	8,584,710	33,999,109
Maria Varsellona (EC member until March 31, 2022)	200,002	181,985	114,896	79,223	576,106	—	576,106
Theodor Swedjemark (EC member until October 31, 2022)	500,004	473,124	283,520	203,210	1,459,858	—	1,459,858
Total departing Executive Committee members	700,006	655,109	398,416	282,433	2,035,964	—	2,035,964
Total	8,341,720	9,879,882	4,334,281	4,894,480	27,450,363	8,584,710	36,035,073

- (1) Represents accrued short-term variable compensation for the year 2022, which will be paid in 2023, after the publication of ABB's financial results. Short-term variable compensation is linked to the targets and goals defined in each EC member's Annual Incentive Plan. Upon full achievement of these targets and goals, the short-term variable compensation of the EC members represents 100 percent of their respective base salary. Maria Varsellona received a short-term variable compensation payment in March 2022 related to her termination period, in accordance with the contractual obligations of ABB.
- (2) Other benefits mainly comprise payments related to social security, health insurance, children's education, transportation, tax advice and compensation for foregone dividends on replacement share grants and certain other items.
- (3) Prepared on an accrual basis.
- (4) The estimated value of the share-based LTIP grants is based on the price of ABB shares on the grant date. On the day of vesting (April 25, 2025), the value of the share-based awards granted under the LTIP may vary from the above amounts due to changes in ABB's share price and the outcome of the performance factors.
- (5) Payments totaling CHF 1,324,301 were made in 2022 on behalf of certain other former EC members, representing social security premium payments due on the 2019 LTIP vesting and tax advisory services for the period when they have been active EC members.

Compensation Exhibit 39: EC compensation in 2021

Name	Cash Compensation					Estimated value of share-based grants under the LTIP in 2021 ⁽⁴⁾	Estimated value of replacement share-based grant in 2021	2021 Total compensation (incl. conditional share-based grants) ⁽⁵⁾
	Base salary	Short-term incentive ⁽¹⁾	Pension benefits	Other benefits ⁽²⁾	2021 Total cash-based compensation ⁽³⁾			
	CHF	CHF	CHF	CHF	CHF	CHF	CHF	CHF
Björn Rosengren	1,700,012	2,465,000	744,770	807,000	5,716,782	2,530,828	—	8,247,610
Timo Ihamuotila	966,675	1,358,000	518,063	570,546	3,413,284	962,708	—	4,375,992
Carolina Granat (EC member as of January 1, 2021)	700,000	980,000	417,382	399,334	2,496,716	694,744	—	3,191,460
Maria Varsellona	800,009	1,160,000	455,000	511,824	2,926,833	793,997	—	3,720,830
Theodor Swedjemark	500,004	725,000	274,535	263,567	1,763,106	397,012	—	2,160,118
Sami Atiya	800,009	1,160,000	482,662	481,598	2,924,269	793,997	—	3,718,266
Tarak Mehta	925,008	1,348,500	507,646	476,481	3,257,635	923,018	—	4,180,653
Peter Terwiesch	800,009	1,160,000	473,441	422,542	2,855,992	793,997	—	3,649,989
Morten Wierod	791,676	1,126,400	443,506	362,112	2,723,694	793,997	—	3,517,691
Total current Executive Committee members at December 31, 2021	7,983,402	11,482,900	4,317,005	4,295,004	28,078,311	8,684,298	—	36,762,609
Sylvia Hill (EC member until December 31, 2020)	730,004	661,380	478,254	524,799	2,394,437	—	—	2,394,437
Total departing Executive Committee members ⁽⁶⁾	730,004	661,380	478,254	524,799	2,394,437	—	—	2,394,437
Total	8,713,406	12,144,280	4,795,259	4,819,803	30,472,748	8,684,298	—	39,157,046

- (1) Represents accrued short-term variable compensation for the year 2021, which was paid in 2022, after the publication of ABB's financial results. Short-term variable compensation is linked to the targets and goals defined in each EC member's Annual Incentive Plan. Upon full achievement of these targets and goals, the short-term variable compensation of the EC members represents 100 percent of their respective base salary. Sylvia Hill received a short-term variable compensation payment in December 2021 related to her termination period, in accordance with the contractual obligations of ABB.
- (2) Other benefits mainly comprise payments related to social security, health insurance, children's education, transportation, tax advice and compensation for foregone dividends on replacement share grants and certain other items.
- (3) Prepared on an accrual basis.
- (4) The estimated value of the share-based LTIP grants was based on the price of ABB shares on the grant date, adjusted for expected foregone dividends during the vesting period. On the day of vesting (April 26, 2024), the value of the share-based awards granted under the LTIP may vary from the above amounts due to changes in ABB's share price and the outcome of the performance factors.
- (5) Payments totaling CHF 296,004 were made in 2021 on behalf of certain other former EC members, representing social security premium payments due on the 2018 LTIP vesting and tax advisory services for the period when they have been active EC members.
- (6) Ulrich Spiesshofer received non-compete payments for the period January 1, 2021, to April 30, 2021, and a vesting of the 2018 LTIP, with related social security payments, totaling to CHF 1,726,896.

Compensation Exhibit 40: LTIP grants in 2022

Name	Reference number of shares under the EPS performance factor of the 2022 launch of the LTIP ^{(1),(4)}	Total estimated value of share-based grants under the EPS performance factor of the 2022 launch of the LTIP ^{(2),(3)}	Reference number of shares under the TSR performance factor of the 2022 launch of the LTIP ^{(1),(4)}	Total estimated value of share-based grants under the TSR performance factor of the 2022 launch of the LTIP ^{(2),(3)}	Reference number of shares under the sustainability performance factor of the 2022 launch of the LTIP ^{(1),(4)}	Total estimated value of share-based grants under the sustainability performance factor of the 2022 launch of the LTIP ^{(2),(3)}	Total number of shares granted under the 2022 launch of the LTIP ^{(1),(2),(4)}	Total estimated value of share-based grants under the LTIP in 2022 ^{(2),(3)}
		CHF		CHF		CHF		CHF
Björn Rosengren ⁽⁵⁾	42,743	1,205,627	25,646	723,353	17,098	482,274	85,487	2,411,254
Timo Ihamuotila	15,804	445,770	9,482	267,462	6,323	178,338	31,609	891,570
Carolina Granat	11,574	326,460	6,944	195,858	4,630	130,602	23,148	652,920
Andrea Antonelli (EC member as of March 1, 2022)	16,762	472,797	10,057	283,667	6,706	189,131	33,525	945,595
Karin Lepasoon (EC member as of October 1, 2022) ⁽⁵⁾	9,578	270,153	5,747	162,075	3,832	108,108	19,157	540,336
Sami Atiya	13,250	373,728	7,950	224,231	5,301	149,526	26,501	747,485
Tarak Mehta ⁽⁵⁾	14,847	418,773	8,908	251,258	5,939	167,515	29,694	837,546
Peter Terwiesch ⁽⁵⁾	13,250	373,728	7,950	224,231	5,301	149,526	26,501	747,485
Morten Wierod ⁽⁵⁾	14,368	405,259	8,620	243,156	5,748	162,104	28,736	810,519

Total Executive Committee members at December 31, 2022	152,176	4,292,295	91,304	2,575,291	60,878	1,717,124	304,358	8,584,710
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- (1) Vesting date April 25, 2025.
- (2) The reference number of shares of the EPS, TSR and sustainability performance factors are valued using the fair value of the ABB shares on the grant date.
- (3) Default settlement of the final LTIP award is 100 percent in shares, with an automatic sell-to-cover in place for employees who are subject to withholding taxes. The plan foresees a maximum award of 200 percent of the number of reference shares granted based on the achievement against the predefined average EPS, relative TSR and sustainability performance targets. Participants are also entitled to receive a dividend equivalent payment at the time of vesting for each awarded share.
- (4) The initial granted number of shares has been increased by 3.7 percent to reflect the impact of the Accelleron spin-off.
- (5) In addition to the above awards, five members of the EC participated in the 19th launch of the ESAP in 2022, which will allow them to save over a 12-month period and, in November 2023, use their savings to acquire ABB shares under the ESAP. Each EC member who participated in ESAP will, upon vesting, be entitled to acquire up to 360 ABB shares at an exercise price of CHF 27.99 per share.

Compensation Exhibit 41: LTIP grants in 2021

Name	Reference number of shares under the EPS performance factor of the 2021 launch of the LTIP ⁽¹⁾	Total estimated value of share-based grants under the EPS performance factor of the 2021 launch of the LTIP ^{(2),(3)}	Reference number of shares under the TSR performance factor of the 2021 launch of the LTIP ⁽¹⁾	Total estimated value of share-based grants under the TSR performance factor of the 2021 launch of the LTIP ^{(2),(3)}	Total number of shares granted under the 2021 launch of the LTIP ^{(1),(2)}	Total estimated value of share-based grants under the LTIP in 2021 ^{(2),(3)}
		CHF		CHF		CHF
Björn Rosengren	47,950	1,265,401	47,951	1,265,427	95,901	2,530,828
Timo Ihamuotila ⁽⁴⁾	18,240	481,354	18,240	481,354	36,480	962,708
Carolina Granat (EC member as of January 1, 2021)	13,163	347,372	13,163	347,372	26,326	694,744
Maria Varsellona	15,043	396,985	15,044	397,012	30,087	793,997
Theodor Swedjemark ⁽⁴⁾	7,522	198,506	7,522	198,506	15,044	397,012
Sami Atiya	15,043	396,985	15,044	397,012	30,087	793,997
Tarak Mehta ⁽⁴⁾	17,488	461,509	17,488	461,509	34,976	923,018
Peter Terwiesch ⁽⁴⁾	15,043	396,985	15,044	397,012	30,087	793,997
Morten Wierod ⁽⁴⁾	15,043	396,985	15,044	397,012	30,087	793,997

Total Executive Committee members at December 31, 2021	164,535	4,342,082	164,540	4,342,216	329,075	8,684,298
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- (1) Vesting date April 26, 2024.
- (2) The reference number of shares of the EPS and TSR performance factors are valued using the fair value of the ABB shares on the grant date adjusted for expected foregone dividends during the vesting period.
- (3) Default settlement of the final LTIP award is 100 percent in shares, with an automatic sell-to-cover in place for employees who are subject to withholding taxes. The plan foresees a maximum award of 200 percent of the number of reference shares granted based on the achievement against the predefined average EPS and relative TSR targets.
- (4) In addition to the above awards, five members of the EC participated in the 18th launch of the ESAP in 2021, which allowed them to save over a 12-month period and, in November 2022, use their savings to acquire ABB shares under the ESAP. Each EC member who participated in ESAP was entitled to acquire up to 330 ABB shares at an exercise price of CHF 30.32 per share.

Compensation Exhibit 42: EC shareholding overview at December 31, 2022

Name	Total number of shares held at December 31, 2022	Unvested 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, 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	90,473	42,852	31,201	26,501	—
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	304,358	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) It is expected that the replacement share grants will be settled 65 percent in shares and 35 percent in cash. However, the participant has the possibility to elect to receive 100 percent of the vested award in shares.

(4) This includes 1,200 shares held by the spouse.

Compensation Exhibit 43: EC shareholding overview at December 31, 2021

	Total number of shares held at December 31, 2021	Vested at December 31, 2021	Unvested at December 31, 2021					
		Number of vested options held under the MIP	Number of unvested options held under the MIP	Reference number of shares deliverable under the 2019 performance factors (EPS and TSR) of the LTIP ⁽¹⁾	Reference number of shares deliverable under the 2020 performance factors (EPS and TSR) of the LTIP ⁽¹⁾	Reference number of shares deliverable under the 2021 performance factors (EPS and TSR) of the LTIP ⁽¹⁾	Replacement share grant for foregone benefits from former employer ⁽²⁾	Replacement share grant for foregone benefits from former employer ⁽²⁾
Name			(vesting 2022)	(vesting 2022)	(vesting 2023)	(vesting 2024)	(vesting 2022)	(vesting 2023)
Björn Rosengren	10,000	—	—	—	131,715	95,901	130,150	18,904
Timo Ihamuotila	150,440	—	—	49,071	49,071	36,480	—	—
Carolina Granat (EC member as of January 1, 2021) ⁽³⁾	1,200	—	—	—	—	26,326	—	—
Maria Varsellona ⁽⁴⁾	26,006	—	—	—	—	—	—	—
Theodor Swedjemark ^{(3)/(5)}	1,360	—	148,750	—	6,209	15,044	—	—
Sami Atiya	51,472	—	—	49,587	41,323	30,087	—	—
Tarak Mehta	118,056	—	—	44,422	46,488	34,976	—	—
Peter Terwiesch	100,440	—	—	41,323	41,323	30,087	—	—
Morten Wierod ⁽⁶⁾	21,025	—	—	36,158	38,740	30,087	—	—
Total Executive Committee members at December 31, 2021	479,999	—	148,750	220,561	354,869	298,988	130,150	18,904

- (1) The final 2019 LTIP award will be settled 65 percent in shares and 35 percent in cash. This applies to both performance factors (EPS and TSR). However, the participants have the possibility to elect to receive 100 percent of the vested award in shares. The final 2020 LTIP and 2021 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) It is expected that the replacement share grant will be settled 65 percent in shares and 35 percent in cash. However, the participant has the possibility to elect to receive 100 percent of the vested award in shares.
- (3) This includes shares held by the spouse.
- (4) Unvested share grants were forfeited as a result of the resignation provided and removed from the shareholding overview.
- (5) In addition, his spouse holds unvested shares and options granted in connection with her role in the Company.
- (6) The disclosed total number of shares held at December 31, 2021, was adjusted to reflect the correct year-end 2021 balance.

Compensation Exhibit 44: Targeted and realized EC total compensation in 2022

Target compensation (in CHF)	Base salary	Pension benefits	Other benefits ⁽¹⁾	Target short-term incentive ⁽²⁾	Grant fair value of 2019 LTIP ⁽³⁾	Grant fair value of 2020 replacement share grant ⁽⁴⁾	Target total variable compensation	Target total compensation
Björn Rosengren	1,770,840	762,478	963,201	1,785,000	n.a.	2,902,345	1,785,000	8,183,864
Timo Ihamuotila	986,672	527,648	707,152	990,000	836,661	n.a.	1,826,661	4,048,133
Carolina Granat	720,843	427,903	342,742	725,000	n.a.	n.a.	725,000	2,216,488
Andrea Antonelli (EC member as of March 1, 2022)	583,334	198,164	239,655	583,334	n.a.	n.a.	583,334	1,604,487
Karin Lepasoon (EC member as of October 1, 2022)	150,000	62,360	37,942	150,000	n.a.	n.a.	150,000	400,302
Sami Atiya	800,009	487,247	618,172	800,000	845,459	n.a.	1,645,459	3,550,887
Tarak Mehta	930,009	513,481	576,171	930,000	757,396	n.a.	1,687,396	3,707,057
Peter Terwiesch	825,001	485,152	508,027	830,000	704,559	n.a.	1,534,559	3,352,739
Morten Wierod	875,006	471,432	512,244	900,000	616,494	n.a.	1,516,494	3,375,176
Total	7,641,714	3,935,865	4,505,306	7,693,334	3,760,569	2,902,345	11,453,903	30,439,133

Realized compensation (in CHF)	Base salary	Pension benefits	Other benefits ⁽¹⁾⁽⁵⁾	Short-term incentive 2022 ⁽⁶⁾	Realized value of 2019 LTIP ⁽⁷⁾	Realized value of 2020 replacement share grant ⁽⁸⁾	Total variable compensation	Total compensation
Björn Rosengren	1,770,840	762,478	988,084	2,142,000	n.a.	4,183,021	2,142,000	9,846,423
Timo Ihamuotila	986,672	527,648	720,953	1,188,000	1,680,963	n.a.	2,868,963	5,104,236
Carolina Granat	720,843	427,903	352,848	870,000	n.a.	n.a.	870,000	2,371,594
Andrea Antonelli (EC member as of March 1, 2022)	583,334	198,164	245,754	670,833	n.a.	n.a.	670,833	1,698,085
Karin Lepasoon (EC member as of October 1, 2022)	150,000	62,360	38,987	165,000	n.a.	n.a.	165,000	416,347
Sami Atiya	800,009	487,247	599,994	539,200	1,698,657	n.a.	2,237,857	4,125,107
Tarak Mehta	930,009	513,481	604,563	1,337,340	1,521,691	n.a.	2,859,031	4,907,084
Peter Terwiesch	825,001	485,152	536,952	1,245,000	1,415,557	n.a.	2,660,557	4,507,662
Morten Wierod	875,006	471,432	523,912	1,067,400	1,238,619	n.a.	2,306,019	4,176,369
Total	7,641,714	3,935,865	4,612,047	9,224,773	7,555,487	4,183,021	16,780,260	37,152,907

Realized achievement level	Base salary	Pension benefits	Other benefits ⁽¹⁾	Short-term incentive ⁽⁶⁾	Realized value of 2019 LTIP in % ⁽⁷⁾	Realized value of 2020 replacement share grant in % ⁽⁸⁾	Total variable compensation	Total compensation
Björn Rosengren	100.0%	100.0%	102.6%	120.0%	n.a.	144.1%	120.0%	120.3%
Timo Ihamuotila	100.0%	100.0%	102.0%	120.0%	200.9%	n.a.	157.1%	126.1%
Carolina Granat	100.0%	100.0%	102.9%	120.0%	n.a.	n.a.	120.0%	107.0%
Andrea Antonelli (EC member as of March 1, 2022)	100.0%	100.0%	102.5%	115.0%	n.a.	n.a.	115.0%	105.8%
Karin Lepasoon (EC member as of October 1, 2022)	100.0%	100.0%	102.8%	110.0%	n.a.	n.a.	110.0%	104.0%
Sami Atiya	100.0%	100.0%	97.1%	67.4%	200.9%	n.a.	136.0%	116.2%
Tarak Mehta	100.0%	100.0%	104.9%	143.8%	200.9%	n.a.	169.4%	132.4%
Peter Terwiesch	100.0%	100.0%	105.7%	150.0%	200.9%	n.a.	173.4%	134.4%
Morten Wierod	100.0%	100.0%	102.3%	118.6%	200.9%	n.a.	152.1%	123.7%
Average	100.0%	100.0%	102.5%	118.3%	200.9%	144.1%	139.2%	118.9%

(1) Other benefits comprise payments related to social security, health insurance, children's education, transportation, tax advice and certain other items.

(2) Target short-term incentive corresponds to 100 percent of the latest applicable annual base salary

(3) Represents the 2019 LTIP grant date fair value as per May 16, 2019, as disclosed in our 2019 Annual Report.

(4) Represents the 2020 grant fair value related to the first tranche (out of two tranches) of the replacement share grant, as disclosed in our 2020 Annual Report.

(5) Differences between realized and target values due to higher social security payments related to AIP awards above target values.

(6) Represents accrued STI for the year 2022, which will be paid in 2023, after the publication of ABB's financial results. STI is linked to the targets and goals defined in each EC member's Annual Incentive Plan.

(7) Valued at CHF 28.31, the closing price of the ABB share on the day of vesting.

(8) Valued at CHF 32.14, the closing price of the ABB share on the day of vesting.

Employees

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

December 31,	2022	2021	2020
Europe	49,700	50,000	49,200
The Americas	26,400	25,600	27,600
Asia, Middle East and Africa	29,000	28,800	28,800
Total	105,100	104,400	105,600

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.

Item 7. Major Shareholders and Related Party Transactions

Major shareholders

At December 31, 2022, we had approximately 639,000 shareholders. Approximately 404,000 were U.S. holders, of which approximately 430 were record holders. Based on the share register, U.S. holders (including holders of ADSs) held approximately 11 percent of the total share capital and voting rights as registered in the Commercial Register on that date.

For information on major shareholders see “Item 6. Directors, Senior Management and Employees—Shareholders—Significant shareholders”.

Related party transactions

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.

Key management personnel

For information on important business relationships between ABB and its Board and EC members, or companies and organizations represented by them, see “Item 6. Directors, Senior Management and Employees” sections entitled “Board of Directors—Business Relationships between ABB and its Board members” and “Executive Committee—Business Relationships between ABB and its EC members”.

Item 8. Financial Information

Consolidated Statements and other financial information

See “Item 18. Financial Statements”.

Legal proceedings

Regulatory

As a result of an internal investigation, ABB self-reported to the Securities and Exchange Commission (SEC) and the Department of Justice (DoJ) in the United States as well as to the Serious Fraud Office (SFO) in the United Kingdom concerning certain of our past dealings with Unaoil and its subsidiaries, including alleged improper payments made by these entities to third parties. In May 2020, the SFO closed its investigation, which it originally announced in February 2017, as the case did not meet the relevant test for prosecution and in December 2022 this matter was closed without action by the DOJ as part of the Kusile settlement.

Based on findings during an internal investigation, ABB self-reported to the SEC and the 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 our dealings with Eskom and related persons. Many of those parties have expressed an interest in, or commenced an investigation into, these matters and we are cooperating fully with them. ABB 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. We made a provision of approximately \$325 million, which was recorded in Other income (expense), net, during the third quarter of 2022. In December 2022, ABB 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 we do not believe that we will need to record any additional provisions for this matter.

General

In addition, we are aware of proceedings, or the threat of proceedings, against us and others in respect of private claims by customers and other third parties with regard to certain actual or alleged anticompetitive practices. Also, we are 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, we will bear the related costs including costs necessary to resolve them.

Liabilities recognized

At December 31, 2022 and 2021, we had aggregate liabilities of \$86 million and \$104 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.

Dividends and dividend policy

Payment of dividends is subject to general business conditions, ABB’s current and expected financial condition and performance and other relevant factors including growth opportunities. ABB’s current dividend policy is to pay a rising, sustainable annual dividend per share over time.

The unconsolidated statutory financial statements of ABB Ltd are prepared in accordance with the Swiss Code of Obligations. Based on these financial statements, dividends may be paid only if ABB Ltd has sufficient distributable profits from previous years or sufficient free reserves to allow the distribution of a dividend. As a holding company, ABB Ltd's main sources of income are dividend and interest payments from its subsidiaries.

At December 31, 2022, the total unconsolidated stockholders' equity of ABB Ltd was CHF 6,219 million, including CHF 236 million representing share capital, CHF 8,852 million representing reserves and CHF 2,869 million representing a reduction of equity for treasury shares. Of the reserves, CHF 2,869 million relating to treasury shares and CHF 47 million representing 20 percent of share capital, at December 31, 2022, are restricted by law and not available for distribution.

With respect to the years ended December 31, 2018, 2019, 2020 and 2021, ABB Ltd paid a dividend of CHF 0.80 (USD 0.79) per share, CHF 0.80 (USD 0.82) per share, CHF 0.80 (USD 0.86) per share and CHF 0.82 (USD 0.88) per share, respectively. The USD amounts for each of the foregoing dividend payments made in CHF have been translated using the average rates of the months in which the dividends were paid.

With respect to the year ended December 31, 2022, ABB Ltd's Board of Directors has proposed to pay a dividend of CHF 0.84 per share to shareholders. The distribution is subject to approval by shareholders at ABB Ltd's 2023 Annual General Meeting (AGM).

For further information on dividends and dividend policy see "Item 6. Directors, Senior Management and Employees—Shareholders—Shareholders' rights—Shareholders' dividend rights".

Significant changes

Except as otherwise described in this Annual Report, there has been no significant change in our financial position since December 31, 2022.

Item 9. The Offer and Listing

Markets

The shares of ABB Ltd. are principally traded on the SIX Swiss Exchange (under the symbol "ABBN") and on the NASDAQ OMX Stockholm Exchange (under the symbol "ABB"). ADSs of ABB Ltd. have been traded on the New York Stock Exchange under the symbol "ABB" since April 6, 2001. ABB Ltd.'s ADSs are issued under the Amended and Restated Deposit Agreement, dated May 7, 2001, as amended from time to time, with Citibank, N.A. as depositary. Each ADS represents one share.

There were no suspensions in the trading of our shares in 2022, 2021 and 2020.

Item 10. Additional Information

Description of share capital and articles of incorporation

This section summarizes the material provisions of ABB Ltd's Articles of Incorporation and the Swiss Code of Obligations relating to the shares of ABB Ltd. The description is only a summary and is qualified in its entirety by ABB Ltd's Articles of Incorporation, a copy of which has been filed as Exhibit 1.1 to this Annual Report, ABB Ltd's filings with the commercial register of the Canton of Zurich (Switzerland) and Swiss statutory law. Other than as disclosed below, the information called for by this Item is set forth in Exhibit 2.4 to this Annual Report and is incorporated by reference into this Annual Report.

Registration and Business Purpose

ABB Ltd was registered as a corporation (*Aktiengesellschaft*) in the commercial register of the Canton of Zurich (Switzerland) on March 5, 1999, under the name of "New ABB Ltd" and its name was subsequently changed to "ABB Ltd". Its commercial register number is CHE-101.049.653.

ABB Ltd's purpose, as set forth in Article 2 of its Articles of Incorporation, is to hold interests in business enterprises, particularly in enterprises active in the areas of industry, trade and services. It may acquire, encumber, exploit or sell real estate and intellectual property rights in Switzerland and abroad and may also finance other companies. It may engage in all types of transactions and may take all measures that appear appropriate to promote, or that are related to, its purpose. Finally, in pursuing its purpose, ABB Ltd shall strive for long-term sustainable value creation.

Capital Structure

For a description of ABB Ltd's capital structure (including issued shares, contingent share capital and authorized share capital) and its dividend policy, see "Item 6. Directors, Senior Management and Employees—Shares" and "Item 8. Financial Information—Dividends and Dividend Policy".

Shareholders' Meetings

Under Swiss law, the annual general meeting of shareholders must be held within 6 months after the end of ABB Ltd's fiscal year. Annual general meetings of shareholders are convened by the board of directors, liquidators or representatives of bondholders or, if necessary, by the statutory auditors. The board of directors is further required to convene an extraordinary general meeting of shareholders if so resolved by the shareholders in a general meeting of shareholders or if so requested by one or more shareholders holding in aggregate at least 10 percent of ABB Ltd's share capital. A general meeting of shareholders is convened by publishing a notice in the Swiss Official Gazette of Commerce (*Schweizerisches Handelsamtsblatt*) at least 20 days prior to the meeting date. In addition, ABB publishes notices for its general meetings in certain newspapers as well as on its website. Such notices contain information as to procedures to be followed by shareholders in order to participate and exercise voting rights at the shareholders' meetings.

One or more shareholders whose combined holdings represent an aggregate par value of at least CHF 48,000 may require, in the form of a written request, 40 calendar days prior to a general meeting of shareholders that specific items and proposals be included on the agenda and voted on at the next general meeting of shareholders.

The following powers are vested exclusively in the general meeting of the shareholders:

- adoption and amendment of the Articles of Incorporation,
- election of members of the Board of Directors, the Chairman of the Board, the members of the Compensation Committee, the auditors and the independent proxy,
- approval of the annual management report and the consolidated financial statements,
- approval of the annual financial statements and decision on the allocation of profits shown on the balance sheet, in particular with regard to dividends,
- approval of the compensation of the Board of Directors and of the Executive Committee pursuant to ABB Ltd's Articles of Incorporation,
- granting discharge to the members of the Board of Directors and the persons entrusted with management, and
- passing resolutions as to all matters reserved to the authority of the shareholders' meeting by law or under ABB Ltd's Articles of Incorporation or that are submitted to the shareholders' meeting by the Board of Directors to the extent permitted by law.

There is no provision in ABB Ltd's Articles of Incorporation requiring a quorum for the holding of shareholders' meetings.

Resolutions and elections usually require the approval of an "absolute majority" of the shares represented at a shareholders' meeting (i.e. a majority of the shares represented at the shareholders' meeting with abstentions having the effect of votes against the resolution). If the first ballot fails to result in an election and more than one candidate is standing for election, the presiding officer will order a second ballot in which a relative majority (i.e. a majority of the votes) shall be decisive.

A resolution passed with a qualified majority (at least two-thirds) of the shares represented at a shareholders' meeting is required for:

- a modification of the purpose of ABB Ltd,
- the creation of shares with increased voting powers,
- restrictions on the transfer of registered shares and the removal of those restrictions,
- restrictions on the exercise of the right to vote and the removal of those restrictions,
- an authorized or conditional increase in share capital,
- an increase in share capital through the conversion of capital surplus, through an in-kind contribution or in exchange for an acquisition of property, and the grant of special benefits,
- the restriction or denial of pre-emptive rights,
- a transfer of ABB Ltd's place of incorporation, and
- ABB Ltd's dissolution.

In addition, the introduction of any provision in ABB Ltd's Articles of Incorporation providing for a qualified majority must be resolved in accordance with such qualified majority voting requirements.

Pursuant to the Swiss Federal Merger Act, special quorum rules apply by law to a merger (*Fusion*) (including a possible squeeze-out merger), de-merger (*Spaltung*), or conversion (*Umwandlung*) of ABB Ltd.

At shareholders' meetings, shareholders can be represented by their legal representative, another shareholder with the right to vote, or the independent proxy elected by the shareholders (*unabhängiger Stimmrechtsvertreter*). All shares held by one shareholder may be represented by only one representative. Votes are taken on a show of hands unless a secret ballot is required by the general meeting of shareholders or the presiding officer. The presiding officer may arrange for resolutions and elections to be carried out by electronic means. As a result, resolutions and elections carried out by electronic means will be deemed to have the same effect as secret ballots. The presiding officer may at any time order that a resolution or election decided by a show of hands be repeated through a secret ballot if, in his view, the results of the vote are in doubt. In this case, the preceding decision by a show of hands shall be deemed to have not occurred.

Only shareholders registered in ABB Ltd's share register with the right to vote are entitled to participate at shareholders' meetings. For practical reasons, shareholders must be registered in the share register with the right to vote no later than 6 business days prior to a shareholders' meeting in order to be entitled to participate and vote at such shareholders' meeting.

Holders of Euroclear Sweden AB-registered shares are provided with financial and other information on ABB Ltd in the Swedish language in accordance with regulatory requirements and market practice. For shares that are registered in the system of Euroclear Sweden AB in the name of a nominee, such information is to be provided by the nominee.

Borrowing Power

Neither Swiss law nor ABB Ltd's Articles of Incorporation restrict in any way ABB Ltd's power to borrow and raise funds. The decision to borrow funds is taken by or under the direction of the Board of Directors or the Executive Committee, and no shareholders' resolution is required.

Directors and Officers

For further information regarding the material provisions of ABB Ltd's Articles of Incorporation and the Swiss Code of Obligations regarding directors and officers, see "Item 6. Directors, Senior Management and Employees—Board of Directors—Board governance".

Auditors

The auditors are elected by the shareholders at the Annual General Meeting. Pursuant to ABB Ltd's Articles of Incorporation, their term of office is one year.

KPMG AG, Zurich, Switzerland, assumed the sole auditing mandate of the consolidated financial statements of the ABB Group beginning in the year ended December 31, 2018. The auditor in charge and responsible for the mandate, Hans-Dieter Krauss, began serving in this capacity in respect of the financial year ended December 31, 2018.

See "Item 16C. Principal Accountant Fees and Services" for information regarding the fees paid to KPMG AG.

Revision of Swiss Corporate Law

Swiss corporate law has been revised, effective as of January 1, 2023. The main objectives of the revision are to strengthen shareholder rights, improve corporate governance and modernize corporate law in general. Swiss corporations are required to amend their articles of incorporation for compliance with the new law by the end of 2024 at the latest. ABB will propose the necessary changes to its Articles of Incorporation for approval by shareholders at its Annual General Meeting in March 2023. These changes will impact certain of the above referred provisions

Material contracts

The following descriptions of the material provisions of the referenced agreements do not purport to be complete and are subject to, and qualified in their entirety by reference to, the agreements which have been filed as exhibits to this Annual Report.

Sale and Purchase agreement relating to the divestment of the Power Grids business

On December 17, 2018, ABB Ltd (the Seller) entered into a Sale and Purchase Agreement with Hitachi Ltd (the Purchaser) for the sale and purchase of 80.1% of the shares of ABB Management Holding AG (or such other entity as agreed between the Seller and the Purchaser). See Exhibit 4.6 to this Annual Report.

Revolving Credit Facilities

On December 16, 2019, ABB entered into a syndicated \$2 billion five-year revolving credit facility with the right to extend for up to two additional years in accordance with its terms. ABB amended and restated its facility on February 16, 2023, for the purpose of addressing the discontinuation of LIBOR. For a description of the facility, see “Item 5. Operating and Financial Review and Prospects—Liquidity and Capital Resources—Credit Facility” and “Note 12 - Debt” to our Consolidated Financial Statements. See Exhibits 4.1 and 4.7 to this Annual Report.

2012 Notes Indenture

On May 8, 2012, ABB's subsidiary, ABB Finance (USA) Inc., issued \$500,000,000 aggregate principal amount of 1.625% notes due 2017, \$1,250,000,000 aggregate principal amount of 2.875% notes due 2022 and \$750,000,000 aggregate principal amount of 4.375% notes due 2042 under an Indenture and a First Supplemental Indenture, dated as of May 8, 2012, among ABB Finance (USA) Inc., ABB and Deutsche Bank Trust Company Americas (the “2012 Indenture”). The notes due in 2017 and 2022 were repaid at maturity. In 2020, the notes due 2042 were subject to a cash tender offer by the issuer and redeemed in part. Pursuant to the terms of the 2012 Indenture, ABB has fully and unconditionally guaranteed payment of principal, premium, if any, and interest in respect of the outstanding notes. See Exhibits 4.2 and 4.3 to this Annual Report.

2018 Notes Indenture

On April 3, 2018, ABB's subsidiary, ABB Finance (USA) Inc., issued (i) \$300,000,000 aggregate principal amount of 2.8% notes due 2020 (ii) \$450,000,000 aggregate principal amount of 3.375% notes, due 2023, and (iii) \$750,000,000 aggregate principal amount of 3.8% notes due 2028 under an Indenture and a First Supplemental Indenture dated, dated as of April 3, 2018, among ABB Finance (USA) Inc., ABB and Deutsche Bank Trust Company Americas (the “2018 Indenture”). The notes due in 2020 were repaid at maturity. The notes due 2023 were redeemed in full in 2020 following the exercise of ABB's early redemption option. The notes due 2028 were subject to a cash tender offer in 2020 by the issuer and redeemed in part. Pursuant to the terms of the 2018 Indenture, ABB has fully and unconditionally guaranteed payment of principal, premium, if any, and interest in respect of the outstanding notes. See Exhibits 4.4 and 4.5 to this Annual Report.

Exchange controls

Other than in connection with Swiss government sanctions imposed on Belarus, Burundi, the Central African Republic, the Democratic Republic of the Congo, Guinea, the Republic of Guinea-Bissau, Haiti, the Islamic Republic of Iran, the Republic of Iraq, Lebanon, Libya, the Republic of Mali, Myanmar (Burma), Nicaragua, the Democratic People's Republic of Korea (North Korea), Somalia, the Republic of South Sudan, Sudan, Syria, Venezuela, Yemen, Zimbabwe, persons and organizations with connection to the late Osama bin Laden, the "al Qaeda" group or the Taliban, certain persons connected with the assassination of Rafik Hariri and sanctions in connection with the situation in the Ukraine, there are currently no laws, decrees or regulations in Switzerland that restrict the export or import of capital, including, but not limited to, Swiss foreign exchange controls on payment of dividends, interest or liquidation proceeds, if any, to non-Swiss resident holders of shares. In addition, there are no limitations imposed by Swiss law or ABB Ltd's Articles of Incorporation on the rights of non-Swiss residents or non-Swiss citizens as shareholders to hold shares or to vote.

Taxation

Swiss Taxation

Withholding Tax on Dividends and Other Distributions

Dividends paid and similar cash or in-kind distributions that we make to a holder of shares or ADSs (including dividends on liquidation proceeds and stock dividends and taxable income resulting from partial liquidation) are subject to a Swiss federal withholding tax at a rate of 35 percent unless such distribution qualifies as a tax-free reorganization under applicable Swiss legislation. A repurchase of shares by us for the purpose of a capital reduction is defined as a partial liquidation of the Company. In this case, the difference between the nominal value of the shares and their repurchase price is qualified as taxable income. The same would be true upon a repurchase of shares if we were not to dispose of the repurchased shares within six years after the repurchase, or if 10 percent of outstanding shares were exceeded. We must withhold the tax from the gross distribution and pay it to the Swiss Federal Tax Administration.

Obtaining a Refund of Swiss Withholding Tax for U.S. Residents

The Convention between the Swiss Confederation and the United States of America for the Avoidance of Double Taxation with Respect to Taxes on Income, which was signed on October 2, 1996 (including any amendments thereto) and which we will refer to in the following discussion as the Treaty, allows U.S. resident individuals or U.S. corporations to seek a refund of the Swiss withholding tax paid in respect of our shares or ADSs if they qualify for benefits under the Treaty. U.S. resident individuals and U.S. corporations holding less than 10 percent of the voting rights in respect of our shares or ADSs are entitled to seek a refund of withholding tax to the extent the tax withheld exceeds 15 percent of the gross dividend or other distribution. U.S. corporations holding 10 percent or more of the voting rights of our shares or ADSs are entitled to seek a refund of withholding tax to the extent the tax withheld exceeds 5 percent of the gross dividend or other distribution. Qualifying U.S. pension or other retirement arrangements and – as from January 1, 2020 – also individual retirement saving plans that do not control the Company are entitled to seek a full refund of withholding tax.

Claims for refunds must be filed with the Swiss Federal Tax Administration, Eigerstrasse 65, 3003 Bern, Switzerland, no later than December 31 of the third year following the calendar year in which the dividend or similar distribution became payable. The form used for obtaining a refund is Swiss Tax Form 82 (82C for companies; 82E for other entities; 82I for individuals; 82R for regulated investment companies (RICs)). This form may be obtained from any Swiss Consulate General in the United States, from the Swiss Federal Tax Administration at the address above or under www.estv.admin.ch. The form must be filled out in triplicate with each copy duly completed and signed before a notary public in the United States. The form must be accompanied by evidence of the deduction of withholding tax withheld at the source (including tax voucher issued by the custodian bank).

Stamp Duties upon Transfer of Securities

The sale of shares or ADSs, whether by Swiss resident or non-resident holders, may be subject to a Swiss securities transfer stamp duty of up to 0.15 percent calculated on the sale proceeds if it occurs through or with a Swiss bank or other Swiss securities dealer as defined in the Swiss Federal Stamp Tax Act. In addition to the stamp duty, the sale of shares or ADSs by or through a member of the SIX Swiss Exchange may be subject to a stock exchange levy.

United States Taxes

The following is a summary of the material U.S. federal income tax consequences of the ownership by U.S. holders (defined below) of shares or ADSs. This summary does not purport to address all of the tax considerations that may be relevant to a decision to purchase, own or dispose of shares or ADSs. This summary assumes that U.S. holders hold shares or ADSs as capital assets for U.S. federal income tax purposes. This summary does not address tax considerations applicable to holders that may be subject to special tax rules, such as U.S. expatriates, dealers or traders in securities or currencies, partnerships owning shares or ADSs, tax-exempt entities, banks and other financial institutions, regulated investment companies, traders in securities that elect to apply a mark-to-market method of accounting, insurance companies, holders that own (or are deemed to own) at least 10 percent or more (by voting power or value) of the stock of ABB, investors whose functional currency is not the U.S. dollar, persons subject to the alternative minimum tax, persons subject to special tax accounting rules as a result of any item of gross income with respect to the shares or ADSs being taken into account in an applicable financial statement, persons that will hold shares or ADSs as part of a position in a straddle or as part of a hedging or conversion transaction for U.S. tax purposes and persons who are not U.S. holders. This discussion does not address aspects of U.S. taxation other than U.S. federal income taxation, nor does it address state, local or foreign tax consequences of an investment in shares or ADSs.

This summary is based (i) on the Internal Revenue Code of 1986, as amended, U.S. Treasury Regulations and judicial and administrative interpretations thereof, in each case as in effect and available on the date of this registration statement and (ii) in part, on representations of the depository and the assumption that each obligation in the deposit agreement and any related agreement will be performed in accordance with its terms. The U.S. tax laws and regulations and the interpretation thereof are subject to change, which change could apply retroactively and could affect the tax consequences described below.

For purposes of this summary, a U.S. holder is a beneficial owner of shares or ADSs that, for U.S. federal income tax purposes, is:

- a citizen or individual resident of the United States,
- a corporation (or other entity treated as a corporation for U.S. federal income tax purposes) created or organized in or under the laws of the United States or any state, including the District of Columbia,
- an estate if its income is subject to U.S. federal income taxation regardless of its source, or
- a trust if such trust validly has elected to be treated as a U.S. person for U.S. federal income tax purposes or if (i) a U.S. court can exercise primary supervision over its administration and (ii) one or more U.S. persons have the authority to control all of its substantial decisions.

If a partnership (including any entity or arrangement treated as a partnership for U.S. federal income tax purposes) is a beneficial owner of shares or ADSs, the treatment of a partner in the partnership will generally depend on the status of the partner and the activities of the partnership. If you are a partner in a partnership that holds shares or ADSs you should consult your tax advisor.

Each prospective purchaser should consult the purchaser's tax advisor with respect to the U.S. federal, state, local and foreign tax consequences of acquiring, owning or disposing of shares or ADSs.

Ownership of ADSs in General, and Exchange of ADSs for Shares

For U.S. federal income tax purposes, a holder of ADSs generally will be treated as the owner of the shares represented by the ADSs, and the following discussion assumes that such treatment will be respected. If so, no gain or loss will be recognized upon an exchange of shares for ADSs or an exchange of ADSs for shares. The U.S. Treasury has expressed concerns that intermediaries in the chain of ownership between the holder of an ADS and the issuer of the security underlying the ADS may be taking actions that are inconsistent with the beneficial ownership of the underlying shares. Accordingly, the creditability of foreign taxes and the availability of the reduced tax rate for dividends received by certain non-corporate U.S. holders, if any, as described below, could be affected by actions taken by intermediaries in the chain of ownership between the holder of an ADS and ABB.

Distributions

In general, for U.S. federal income tax purposes, the gross amount of distributions (other than certain distributions, if any, of shares distributed to all shareholders of ABB, including holders of ADSs) made to you with respect to shares or ADSs, including the amount of any Swiss taxes withheld from the distribution, will constitute dividends and be includible in gross income in the year received to the extent of ABB's current and accumulated earnings and profits (as determined under U.S. federal income tax principles).

Non-corporate U.S. holders generally will be taxed on such distributions at the lower rates applicable to long-term capital gains (i.e., gains from the sale of capital assets held for more than one year) with respect to distributions during 2022, provided that the U.S. holder meets certain holding period and other requirements and provided that such distributions constitute "qualified dividends" for U.S. federal income tax purposes. Distributions treated as dividends will not be treated as "qualified dividends" if we were to be treated as a "passive foreign investment company" (PFIC) for U.S. federal income tax purposes in the year that the dividend is paid or in the year prior to the year that the dividend is paid. Based on certain estimates of its gross income and gross assets and the nature of its business, ABB believes that it will not be classified as a PFIC for the taxable year ended December 31, 2022, and does not expect to be classified as a PFIC for the taxable year ending December 31, 2023. ABB's status in the current year and in future years will depend on its assets and activities in those years. ABB has no reason to believe that its assets or activities will change in a manner that would cause it to be classified as a PFIC. However, as PFIC status is a factual matter that depends on, among other things, the composition of the income and assets, and the market value of the assets as reflected in market capitalization, of ABB and its subsidiaries that must be determined annually at the close of each taxable year, there can be no certainty regarding ABB's PFIC status in any particular year until the end of that year. Furthermore, because the value of our gross assets is likely to be determined in large part by reference to our market capitalization, a decline in the value of our shares or ADSs may result in our becoming a PFIC. Accordingly, there can be no assurance with respect to our status as a PFIC for our current taxable year or any future taxable year. The remainder of this discussion assumes that ABB will not be classified as a PFIC. U.S. holders are urged to consult their own tax advisors regarding the availability to them of the reduced dividend rate in light of their own particular circumstances and the consequences to them if ABB were to be treated as a PFIC with respect to any taxable year.

Dividends paid to U.S. corporate holders will not be eligible for the dividends received deduction generally allowed to corporate U.S. holders.

If you are a U.S. holder and distributions with respect to shares or ADSs exceed ABB's current and accumulated earnings and profits as determined under U.S. federal income tax principles, then the excess generally would be treated first as a tax-free return of capital to the extent of your adjusted tax basis in the shares or ADSs. Any amount in excess of the amount of the dividend and the return of capital generally would be treated as capital gain. ABB does not maintain calculations of its earnings and profits under U.S. federal income tax principles, so a U.S. holder should expect all cash distributions to be reported as dividends for U.S. federal income tax purposes.

If you are a U.S. holder, then dividends paid in Swiss francs, including the amount of any Swiss taxes withheld from the dividends, will be included in your gross income in an amount equal to the U.S. dollar value of the Swiss francs calculated by reference to the spot exchange rate in effect on the day the dividends are includible in income. In the case of ADSs, dividends generally are includible in income on the date they are received by the depository, regardless of whether the payment is in fact converted into U.S. dollars at that time. If dividends paid in Swiss francs are converted into U.S. dollars on the day they are includible in income, then you generally should not be required to recognize foreign currency gain or loss with respect to the conversion. However, any gains or losses resulting from the conversion of Swiss francs between the time of the receipt of dividends paid in Swiss francs and the time the Swiss francs are converted into U.S. dollars will be treated as ordinary income or loss to you. The amount of any distribution of property other than cash will be the fair market value of the property on the date of distribution.

If you are a U.S. holder, then dividends received by you with respect to shares or ADSs will be treated as foreign source income, which may be relevant in calculating your foreign tax credit limitation. Subject to certain conditions and limitations, Swiss tax withheld on dividends may be deducted from your taxable income or credited against your U.S. federal income tax liability. However, to the extent that you would be entitled to a refund of Swiss withholding taxes pursuant to the U.S.-Switzerland tax treaty, you may not be eligible for a U.S. foreign tax credit with respect to the amount of such withholding taxes which may be refunded, even if you fail to claim the refund. See “—Swiss Taxation—Obtaining a Refund of Swiss Withholding Tax for U.S. Residents”. The limitation on foreign taxes eligible for credit is calculated separately with respect to specific classes of income. For this purpose, dividends distributed by ABB generally will constitute passive income. The rules relating to the determination of the U.S. foreign tax credit are complex, and you should consult your tax advisor to determine whether and to what extent you would be entitled to this credit.

Sale, Exchange or other Taxable Disposition of Shares or ADSs

If you are a U.S. holder that holds shares or ADSs as capital assets, then you generally will recognize capital gain or loss for U.S. federal income tax purposes upon a sale, exchange or other taxable disposition of your shares or ADSs in an amount equal to the difference between your adjusted tax basis in the shares or ADSs and the amount realized on their disposition. If you are a non-corporate U.S. holder, the maximum marginal U.S. federal income tax rate applicable to the gain is generally lower than the maximum marginal U.S. federal income tax rate applicable to ordinary income (other than certain dividends) if your holding period for the shares or ADSs exceeds one year (i.e., long term capital gains). If you are a U.S. holder, then the gain or loss, if any, recognized by you generally will be treated as U.S. source income or loss, for U.S. foreign tax credit purposes.

If you are a U.S. holder and you receive any foreign currency on the disposition of shares or ADSs, the amount realized will be the U.S. dollar value of the payment received, translated at the spot rate of exchange on the date of taxable disposition. If the shares are treated as traded on an established securities market, a cash basis U.S. holder and an accrual basis U.S. holder who has made a special election (which must be applied consistently from year to year and cannot be changed without the consent of the U.S. Internal Revenue Service) will determine the U.S. dollar value of the amount realized in foreign currency by translating the amount received at the spot rate of exchange on the settlement date of the disposition. An accrual basis U.S. holder that does not make the special election will recognize U.S. source ordinary income or loss as a result of currency fluctuations between the trade date and the settlement date of the disposition of the shares or ADSs.

Medicare Tax

For taxable years beginning after December 31, 2012, certain U.S. holders who are individuals, estates or trusts must pay a 3.8 percent tax on the lesser of (i) the U.S. holder's "net investment income" for the relevant taxable year and (ii) the excess of the U.S. holder's modified adjusted gross income for the taxable year over a certain threshold (which in the case of individuals will be between \$125,000 and \$250,000, depending on the individual's circumstances). A U.S. holder's net investment income will generally include its dividend income and its net gains from the disposition of shares or ADSs, unless such income or net gains are derived in the ordinary course of the conduct of a trade or business (other than a trade or business that consists of certain passive or trading activities). If you are a U.S. holder that is an individual, estate or trust, you are urged to consult your tax advisor regarding the applicability of the Medicare tax to your income and gains in respect of your investment in shares or ADSs.

Information with Respect to Foreign Financial Assets

Certain U.S. holders who are individuals (and certain entities) that hold an interest in "specified foreign financial assets" (which may include the shares) are required to report information relating to such assets, subject to certain exceptions (including an exception for shares held in accounts maintained by certain financial institutions). Penalties can apply if U.S. holders fail to satisfy such reporting requirements. U.S. holders should consult their tax advisors regarding the effect, if any, of this requirement on their ownership and disposition of the shares.

Backup Withholding and Information Reporting

U.S. backup withholding tax and information reporting requirements generally apply to certain payments to certain non-corporate holders of stock. Information reporting generally will apply to payments of dividends on, and to proceeds from the sale or redemption of, shares or ADSs made within the United States to a holder of shares or ADSs (other than an exempt recipient, including a corporation, a payee that is not a U.S. holder that provides an appropriate certification, and certain other persons).

A payor will be required to withhold backup withholding tax from any payments of dividends on, or the proceeds from the sale or redemption of, shares or ADSs within the United States to you, unless you are an exempt recipient, if you fail to furnish your correct taxpayer identification number or otherwise fail to establish an exception from backup withholding tax requirements. U.S. holders who are required to establish their exempt status may be required to provide such certification on U.S. Internal Revenue Service Form W-9. Backup withholding is not an additional tax. The amount of any backup withholding from a payment to you may be allowed as a credit against your U.S. federal income tax liability and may entitle you to a refund, provided that the required information is furnished timely to the U.S. Internal Revenue Service.

THE ABOVE SUMMARIES ARE NOT INTENDED TO CONSTITUTE A COMPLETE ANALYSIS OF ALL TAX CONSEQUENCES RELATING TO THE OWNERSHIP OF SHARES OR ADSs. PROSPECTIVE PURCHASERS OF SHARES OR ADSs SHOULD CONSULT THEIR TAX ADVISORS CONCERNING THE TAX CONSEQUENCES OF THEIR PARTICULAR SITUATIONS.

Documents on display

We are subject to the informational requirements of the Exchange Act. In accordance with these requirements, we file reports and other information with the SEC. The SEC maintains a website at www.sec.gov that contains reports, including this Annual Report and the exhibits thereto, and other information regarding registrants that file electronically with the SEC. Our Annual Reports on Form 20-F, reports on Form 6-K and other information we submit to the SEC may be accessed through this website. In addition, material that we file can be inspected at the offices of the New York Stock Exchange at 11 Wall Street, New York, New York 10005.

Item 11. Quantitative and Qualitative Disclosures about Market Risk

Market Risk Disclosure

The continuously evolving financial markets and the dynamic business environment expose us to changes in foreign exchange, interest rate and other market price risks. We have developed and implemented comprehensive policies, procedures, and controls to identify, mitigate, and monitor financial risk on a company-wide basis. To efficiently aggregate and manage financial risks that could impact our financial performance, we operate a Corporate Treasury Operations function. Our Corporate Treasury Operations provides an efficient source of liquidity, financing, risk management and other global financial services to the ABB Group companies. Our policies do not allow our Corporate Treasury Operations or ABB Group companies to perform speculative trading. Market risk management activities are focused on mitigating material financial risks resulting from our global operating and financing activities.

Corporate Treasury Operations maintains risk management control systems to monitor foreign exchange and interest rate risks and exposures arising from our underlying business, as well as the associated hedge positions. Our written policies govern how such exposures are managed. Financial risks are monitored using a number of analytical techniques including market value and sensitivity analysis. The following quantitative analyses are based on sensitivity analysis tests, which assume parallel shifts of interest rate yield curves, and foreign exchange rates and equity prices.

Currency Fluctuations and Foreign Exchange Risk

It is our policy to identify and manage all transactional foreign exchange exposures to minimize risk. With the exception of certain financing subsidiaries and to the extent certain operating subsidiaries are domiciled in high inflation environments, the functional currency of each of our companies is considered to be its local currency. Our policies require our subsidiaries to hedge all contracted foreign exchange exposures, as well as a portion of their forecast exposures, against their local currency. These transactions are undertaken mainly with our Corporate Treasury Operations.

We have foreign exchange transaction exposures related to our global operating and financing activities in currencies other than the functional currency in which our entities operate. Specifically, we are exposed to foreign exchange risk related to future earnings, assets or liabilities denominated in foreign currencies. The most significant currency exposures relate to operations in the Eurozone area, Sweden and Switzerland. In addition, we are exposed to currency risk associated with translating our functional currency financial statements into our reporting currency, which is the U.S. dollar.

Our operating companies are responsible for identifying their foreign currency exposures and entering into intercompany derivative contracts with Corporate Treasury Operations, where legally possible, to hedge their exposures. Where local laws restrict our operating companies from entering into intercompany derivatives with Corporate Treasury Operations, derivative contracts are entered into locally with third-party financial institutions. The intercompany transactions have the effect of transferring the operating companies' currency risk to Corporate Treasury Operations, but create no additional market risks on a consolidated basis. Corporate Treasury Operations then manages this risk by entering into offsetting transactions with third-party financial institutions. According to our policy, material net currency exposures are required to be hedged and are primarily hedged with forward foreign exchange contracts. The majority of the foreign exchange hedge instruments have, on average, a maturity of less than twelve months. Corporate Treasury Operations also hedges currency risks arising from monetary intercompany balances, primarily loans receivable from other ABB companies.

At December 31, 2022 and 2021, the net fair value of financial instruments with exposure to foreign currency rate movements was an asset of \$1,355 million and \$2,048 million, respectively. The potential loss in fair value of such financial instruments from a hypothetical 10 percent move in foreign exchange rates against our position would be approximately \$511 million and \$367 million for December 31, 2022 and 2021, respectively. The analysis reflects the aggregate adverse foreign exchange impact associated with transaction exposures, as well as translation exposures where appropriate. Our sensitivity analysis assumes a simultaneous shift in exchange rates against our positions exposed to foreign exchange risk and as such assumes an unlikely adverse case scenario. Exchange rates rarely move in the same direction. Therefore, the assumption of a simultaneous shift may overstate the impact of changing rates on assets and liabilities denominated in foreign currencies. The underlying trade-related transaction exposures of the industrial companies are not included in the quantitative analysis. If these underlying transaction exposures were included, they would tend to have an offsetting effect on the potential loss in fair value detailed above.

Interest Rate Risk

We are exposed to interest rate risk due to our financing, investing, and liquidity management activities. Our operating companies primarily invest excess cash with, and receive funding from, our Corporate Treasury Operations on an arm's length basis. It is our policy that the primary third-party funding and investing activities, as well as the monitoring and management of the resulting interest rate risk, are the responsibility of Corporate Treasury Operations. Corporate Treasury Operations adjusts the duration of the overall funding portfolio through derivative instruments in order to better match underlying assets and liabilities, as well as minimize the cost of capital.

At December 31, 2022 and 2021, the net fair value of instruments subject to Interest Rate Risk was an asset of \$1,617 million and \$2,320 million, respectively. The potential loss in fair value for such instruments from a hypothetical 100 basis points parallel shift in interest rates against our position (or a multiple of 100 basis points where 100 basis points is less than 10 percent of the interest rate) would be approximately \$163 million and \$270 million, for December 31, 2022 and 2021, respectively.

Equity Risk

Certain of our entities have equity investments that expose us to equity price risk. At December 31, 2022 and 2021, the net fair value of equity risk sensitive instruments was an asset of \$15 million and \$29 million, respectively. The potential loss in fair value of such financial instruments from a hypothetical 10 percent move in the underlying equity prices against our position would be approximately \$4 million and \$13 million, for December 31, 2022 and 2021, respectively.

Commodity Risk

We enter into commodity derivatives to hedge certain of our raw material exposures. At December 31, 2022 and 2021, the net fair value of commodity derivatives was an asset of \$1 million and \$1 million, respectively. The potential loss in fair value for such commodity hedging derivatives from a hypothetical adverse 10 percent move against our position in the underlying commodity prices would be approximately \$10 million and \$11 million for December 31, 2022 and 2021, respectively. A portion of our commodity derivatives are denominated in euro. The foreign exchange risk arising on such contracts has been excluded from the calculation of the potential loss in fair value from a hypothetical 10 percent move in the underlying commodity prices as discussed above.

Item 12. Description of Securities Other Than Equity Securities

American Depositary Shares

Depositary fees payable upon the issuance and cancellation of ADSs are typically paid to the depositary bank by the brokers (on behalf of their clients) receiving the newly-issued ADSs from the depositary bank and by the brokers (on behalf of their clients) delivering the ADSs to the depositary bank for cancellation. The brokers in turn may charge these transaction fees to their clients.

Depositary fees payable in connection with distributions of cash or securities to ADS holders and the depositary services fee are charged by the depositary bank to the holders of record of ADSs as of the applicable ADS record date. The depositary fees payable for cash distributions are generally deducted from the cash being distributed. In the case of distributions other than cash (i.e., stock dividends, rights offerings), the depositary bank charges the applicable fee to the ADS record date holders concurrent with the distribution. In the case of ADSs registered in the name of the investor (whether certificated or un-certificated in direct registration), the depositary bank sends invoices to the applicable record date ADS holders. In the case of ADSs held in brokerage and custodian accounts via the central clearing and settlement system, The Depository Trust Company (DTC), the depositary bank, generally collects its fees through the systems provided by DTC (whose nominee is the registered holder of the ADSs held in DTC) from the brokers and custodians holding ADSs in their DTC accounts. The brokers and custodians who hold their clients' ADSs in DTC accounts in turn charge their clients' accounts the amount of the fees paid to the depositary banks.

In the event of refusal to pay the depositary fees, the depositary bank may, under the terms of the deposit agreement, refuse the requested service until payment is received or may set-off the amount of the depositary fees from any distribution to be made to the ADS holder.

Depositary fees are as follows:

Depositary Service	Fee
Issuance of ADSs	Up to \$5.00 per 100 ADSs (or fraction thereof) issued.
Cancellation of ADSs	Up to \$5.00 per 100 ADSs (or fraction thereof) cancelled.
Distribution of cash dividends or other cash distribution	Up to \$5.00 per 100 ADSs (or fraction thereof) held.
Distribution of ADSs pursuant to (i) stock dividends or other free stock distributions, or (ii) an exercise of rights to purchase additional ADSs	Up to \$5.00 per 100 ADSs (or fraction thereof) held.
Distribution of securities other than ADSs or rights to purchase additional ADSs	Up to \$5.00 per 100 ADSs (or fraction thereof) held.
Depositary service fee	Up to \$5.00 per 100 ADSs (or fraction thereof) held on the applicable record date(s) established by the Depositary.
Registration of ADS transfers	Up to \$5.00 per 100 ADSs (or fraction thereof) transferred.
Conversion of ADSs of one series for ADSs of another series	Up to \$5.00 per 100 ADSs (or fraction thereof) converted.

Depositary Payments

In 2022, we received reimbursements from Citibank N.A., the Depositary Bank of our ADS program, of approximately \$7 million to help cover costs related to our ADS program. Those costs, in addition to costs associated with compliance with U.S. securities laws, include expenses such as listing fees, proxy expenses, printing and distribution of reports, and other investor relations-related activities.

PART II

Item 13. Defaults, Dividend Arrearages and Delinquencies

None

Item 14. Material Modifications to the Rights of Security Holders and Use of Proceeds

None

Item 15. Controls and Procedures

Disclosure controls and procedures

In designing and evaluating our disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable, not absolute, assurance of achieving the desired control objectives. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints and that management is required to apply judgment in evaluating the benefits of possible controls and procedures relative to their costs.

Our Chief Executive Officer, Björn Rosengren, and Chief Financial Officer, Timo Ihamuotila, with the participation of key corporate senior management and management of key corporate functions, performed an evaluation of our disclosure controls and procedures (as defined in Rule 13a-15(e) of the Exchange Act) as of December 31, 2022. Based on that evaluation, management, including the Chief Executive Officer and Chief Financial Officer, has concluded that, as of December 31, 2022, our disclosure controls and procedures were effective.

Management's annual report on internal control over financial reporting

The Board of Directors and management of the ABB Group are responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rule 13a-15(f) of the Exchange Act.

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 and procedures may deteriorate.

Management conducted an assessment of the effectiveness of internal control over financial reporting as of December 31, 2022. In making this assessment, management used 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 internal control over financial reporting was effective as of December 31, 2022.

Report of the independent registered public accounting firm

KPMG's opinion on the effectiveness of the ABB Group's internal control over financial reporting as of December 31, 2022, is included in "Item 18. Financial Statements".

Changes in internal control over financial reporting

There have been no changes in our internal control over financial reporting that occurred during the period covered by this annual report that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 16. [Reserved]

Item 16A. Audit Committee Financial Expert

Our Board of Directors has determined that David Meline, Gunnar Brock, Geraldine Matchett and Satish Pai, who serve on our Finance, Audit and Compliance Committee (FACC), are independent for purposes of serving on the audit committee under Rule 10A-3 of the Exchange Act and the listing standards promulgated by the New York Stock Exchange, and are audit committee financial experts.

Item 16B. Code of Ethics

Our Board of Directors as well as our Chief Executive Officer, Chief Financial Officer, principal accounting officer and persons performing similar functions are bound to adhere to our Code of Conduct, which applies to all employees of all companies in the ABB Group. Our Code of Conduct is available on our website in the section “Corporate governance” at <https://global.abb/group/en/about>. ABB intends to satisfy any applicable disclosure requirement regarding amendment to, or waiver from, a provision of our Code of Conduct by posting such information on our website at the address and location specified above.

Item 16C. Principal Accountant Fees and Services

The aggregate fees for services rendered by KPMG AG, Zurich, Switzerland (PCAOB ID 3240), along with their respective affiliates for professional services were as follows:

(\$ in millions)	KPMG	
	2022	2021
Audit Fees	36.6	34.5
Audit-Related Fees	8.6	13.0
Tax Fees	0.4	0.5
Other Fees	0.1	0.1
Total	45.7	48.1

Audit Fees

Audit fees include the standard audit work performed each fiscal year necessary to allow the auditor to issue an opinion on our Consolidated Financial Statements (including the integrated audit of internal controls over financial reporting) and to issue an opinion on the local statutory financial statements of ABB Ltd and its subsidiaries. Audit fees also include services that can be provided only by the ABB Group auditor such as pre-issuance reviews of quarterly financial results (no such reviews have been performed) and comfort letters delivered to underwriters in connection with debt and equity offerings. Included in the 2022 audit fees were approximately \$2.8 million related to audits from 2021 and earlier, which were not agreed until after we had filed our annual report on Form 20-F with the SEC on February 25, 2022. Included in the 2021 audit fees were approximately \$4.7 million related to audits from 2020 and earlier, which were not agreed until after we had filed our annual report on Form 20-F with the SEC on February 26, 2021.

Audit-Related Fees

These services consisting primarily of carve-out financial statement audits in relation to transactional activities, service organization attestation procedures, agreed-upon procedure reports, accounting consultations, audits of pension and benefit plans, accounting advisory services and other attest services related to financial reporting that are not required by statute or regulation.

Tax Fees

Fees for tax services represent primarily income tax and indirect tax compliance services as well as tax advisory services.

All Other Fees

Fees for other services not included in the above three categories.

Pre-Approval Procedures and Policies

In accordance with the requirements of the U.S. Sarbanes-Oxley Act of 2002 and rules issued by the SEC, we utilize a procedure for the review and pre-approval of any services performed by KPMG. The procedure requires that all proposed engagements of KPMG for audit and permitted non-audit services are submitted to the FACC for approval prior to the beginning of any such services. In accordance with this policy, all services performed by and fees paid to KPMG in 2022 and 2021 were approved by the FACC.

Item 16D. Exemptions from the Listing Standards for Audit Committees

None

Item 16E. Purchase of Equity Securities by Issuer and Affiliated Purchasers

The following table sets out certain information about purchases of our own shares made by us or on our behalf or by affiliated purchasers:

	Total number of shares purchased ⁽¹⁾	Average price paid per share (in \$)	Total number of shares purchased as part of publicly announced programs ⁽²⁾⁽³⁾	Maximum approximate value of shares that may yet be purchased under the programs (\$ in millions)
2022				
January 1-31	13,861,000	36.51	9,761,000	1,922
February 1-28	18,895,000	34.35	12,895,000	1,479
March 1-31	12,282,500	32.93	8,782,500	—
April 1-30	16,927,000	31.66	15,177,000	2,520
May 1-31	9,676,000	29.49	8,626,000	2,265
June 1-30	11,099,000	28.02	10,049,000	1,984
July 1-31	9,564,000	27.06	8,514,000	1,754
August 1-31	4,706,000	29.51	3,606,000	1,648
September 1-30	4,064,000	27.23	3,664,000	1,548
October 1-31	3,526,000	26.16	3,526,000	1,456
November 1-30	3,603,000	30.25	3,603,000	1,347
December 1-31	3,191,000	30.87	3,191,000	1,248
Total	111,394,500		91,394,500	

(1) In 2022, 20 million shares were bought outside of the publicly announced programs. These share purchases were made through open-market transactions.

(2) In March 2021, ABB 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 ran until ABB's Annual General Meeting (AGM) in March 2022. At the 2022 AGM, shareholders approved the cancellation of 88 million shares which had been purchased under the share buyback programs launched in July 2020 and April 2021. The cancellation was completed in the second quarter of 2022.

(3) In March 2022, ABB announced a new share buyback program of up to \$3 billion. This program, which was launched in April 2022, is being executed on a second trading line on the SIX Swiss Exchange and is planned to run until the March 2023 AGM. At the 2023 AGM, ABB intends to request shareholder approval to cancel the shares purchased through this new program as well as those shares purchased under the program launched in April 2021 that were not proposed for cancellation at the 2022 AGM.

Item 16F. Change in Registrant's Certifying Accountant

Not applicable.

Item 16G. Corporate Governance

See “Item 6. Directors, Senior Management and Employees—Other governance information—Governance differences from NYSE Standards” for significant ways in which ABB’s corporate governance practices differ from the New York Stock Exchange’s standards.

Item 16H. Mine Safety Disclosure

Not applicable.

Item 16I. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not applicable.

PART III

Item 17. Financial Statements

We have elected to provide financial statements and the related information pursuant to Item 18.

Item 18. Financial Statements

See pages F-1 to F-85, which are incorporated herein by reference. All schedules are omitted as the required information is inapplicable or the information is presented in the Consolidated Financial Statements or notes thereto.

Item 19. Exhibits

- 1.1 Articles of Incorporation of ABB Ltd as amended to date.⁽¹⁾
- 2.1 Form of Amendment No. 1 to the Amended and Restated Deposit Agreement, by and among ABB Ltd, Citibank, N.A., as Depositary, and the holders and beneficial owners from time to time of the American Depositary Shares issued thereunder (including as an exhibit the form of American Depositary Receipt). Included as Exhibit (a)(i) to Form F-6 (File No. 333-253576) filed by ABB Ltd on February 26, 2021.
- 2.2 Form of Amended and Restated Deposit Agreement, by and among ABB Ltd, Citibank, N.A., as Depositary, and the holders and beneficial owners from time to time of the American Depositary Shares issued thereunder (including as an exhibit the form of American Depositary Receipt). Incorporated by reference to Exhibit (a) to Form F-6EF (File No. 333-147488) filed by ABB Ltd on November 19, 2007.
- 2.3 Form of American Depositary Receipt (included in Exhibit 2.1).
- 2.4 Description of Securities⁽¹⁾
- 4.1 \$2,000,000,000 Multicurrency Revolving Credit Agreement, dated December 16, 2019, entered into between ABB Ltd, certain subsidiaries of ABB Ltd as borrowers, 19 banks as mandated lead arrangers, Citibank Europe PLC, UK Branch, as facility agent and euro swingline agent and Citibank N.A. as dollar swingline agent. Incorporated by reference to Exhibit 4.1 to the Annual Report on Form 20-F filed by ABB Ltd on February 26, 2020.
- 4.2 Indenture dated as of May 8, 2012, among ABB Finance (USA) Inc., ABB and Deutsche Bank Trust Company Americas, pursuant to which ABB has fully and unconditionally guaranteed payment of principal, premium, if any, and interest in respect of any notes issued thereunder. On May 8, 2012, ABB's subsidiary, ABB Finance (USA) Inc., issued \$500,000,000 aggregate principal amount of 1.625% notes due 2017, \$1,250,000,000 aggregate principal amount of 2.875% notes due 2022 and \$750,000,000 aggregate principal amount of 4.375% notes due 2042 under the Indenture. Incorporated by reference to Exhibit 1 to the Form 6-K filed by ABB Ltd on March 9, 2018.
- 4.3 First Supplemental Indenture, dated as of May 8, 2012, among ABB Finance (USA) Inc., as Issuer, ABB Ltd, as Guarantor, and Deutsche Bank Trust Company Americas, as Trustee. Incorporated by reference to Exhibit 2 to the Form 6-K filed by ABB Ltd on March 9, 2018.
- 4.4 Indenture dated as of April 3, 2018, among ABB Finance (USA) Inc., ABB Ltd. and Deutsche Bank Trust Company Americas, pursuant to which ABB has fully and unconditionally guaranteed payment of principal, premium, if any, and interest in respect of any notes issued thereunder. On March 26, 2018, ABB's subsidiary, ABB Finance (USA) Inc., issued \$300,000,000 aggregate principal amount of 2.8% notes due 2020, \$450,000,000 aggregate principal amount of 3.375% notes due 2023 and \$750,000,000 aggregate principal amount of 3.8% notes due 2028 under the Indenture. Incorporated by reference to Exhibit 4.1 to the Form 6-K filed by ABB Ltd on April 3, 2018.
- 4.5 First Supplemental Indenture dated April 3, 2018, among ABB Finance (USA) Inc., ABB Ltd and Deutsche Bank Trust Company Americas, as Trustee (including the form of the 2.800% Notes due 2020, the form of the 3.375% Notes due 2023 and the form of the 3.800% Notes due 2028). Incorporated by reference to Exhibit 4.2 to the Form 6-K filed by ABB Ltd on April 3, 2018.
- 4.6 Sale and Purchase Agreement dated December 17, 2018, between ABB Ltd (the Seller) and Hitachi Ltd (the Purchaser) for the sale and purchase of 80.1% of the shares in ABB Management Holding AG (or such other entity as agreed between the Seller and the Purchaser). Incorporated by reference to Exhibit 4.6 to the Form 20-F filed by ABB Ltd on March 28, 2019.
- 4.7 Amendment and restatement agreement dated February 16, 2023, between ABB Ltd, certain subsidiaries of ABB Ltd as original borrowers, the mandated lead arrangers, the original lenders, Citibank Europe PLC, UK Branch, as facility agent and euro swingline agent and Citibank, N.A. as dollar swingline agent, relating to the \$2,000,000,000 Multicurrency Revolving Credit agreement dated December 16, 2019 (incorporated by reference to Exhibit 4.1 above).⁽¹⁾
- 8.1 Subsidiaries of ABB Ltd as of December 31, 2022.⁽¹⁾
- 12.1 Certification of the chief executive officer pursuant to Section 302 of the Sarbanes Oxley Act of 2002.⁽¹⁾

12.2	Certification of the chief financial officer pursuant to Section 302 of the Sarbanes Oxley Act of 2002. ⁽¹⁾
13.1	Certification by the chief executive officer of ABB Ltd pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes Oxley Act of 2002.*
13.2	Certification by the chief financial officer of ABB Ltd pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes Oxley Act of 2002.*
15.1	Consent of KPMG AG. ⁽¹⁾
17.1	List of Subsidiary Issuers and Guarantors of Registered Securities. ⁽¹⁾
101.INS	XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	Inline XBRL Taxonomy Extension Schema Document
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101) ⁽¹⁾

* This document is being furnished in accordance with SEC Release Nos. 33-8212 and 34-74551.

(1) Filed herewith

SIGNATURES

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this Annual Report on its behalf.

ABB LTD

Date: February 23, 2023

By: /s/ TIMO IHAMUOTILA

Name: Timo Ihamuotila

Title: *Executive Vice President and
Chief Financial Officer*

Date: February 23, 2023

By: /s/ RICHARD A. BROWN

Name: Richard A. Brown

Title: *Group Senior Vice President and
Chief Counsel Corporate & Finance*

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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, 2022.

KPMG AG, the independent registered public accounting firm who audited the Company's consolidated financial statements included in this Form 20-F, has issued an opinion on the effectiveness of ABB's internal control over financial reporting as of December 31, 2022, which is included on page F-5 of this Annual Report.

/s/ BJÖRN ROSENGREN

Chief Executive Officer

/s/ TIMO IHAMUOTILA

Chief Financial Officer

Zurich, February 23, 2023

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of ABB Ltd

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of ABB Ltd and its subsidiaries (the Company) as of December 31, 2022 and 2021, 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, 2022, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2022, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated February 23, 2023, expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

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

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

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

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

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, 2022, the Company reported \$24,471 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 Company's estimates regarding the amount of future direct materials, labor and subcontract costs, and indirect costs to complete the contracts.

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 Company'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 Company'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 Company and the customer and/or subcontractors.

Valuation of unrecognized tax benefits related to transfer pricing

As discussed in Note 2 to the consolidated financial statements, the Company operates across multiple tax jurisdictions, is exposed to numerous tax laws and is regularly subject to tax audits by local tax authorities. As discussed in Note 16, the Company reported total unrecognized tax benefits of \$1,350 million, a portion of which related to transfer pricing.

We identified the valuation of unrecognized tax benefits related to transfer pricing as a critical audit matter. A high degree of subjective auditor judgment and specialized skills and knowledge was required in assessing the Company's interpretation of international tax practice and developments in relation to intragroup charges and intragroup sales of goods and services and the Company's ability to estimate the resolution of the tax positions.

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 Company's tax process including controls related to the Company's interpretation of international tax practice and developments in relation to intragroup charges and intragroup sale of goods and services and the estimate of the related unrecognized tax benefits. We tested the identified costs that have a higher likelihood of being challenged by tax authorities associated with intragroup arrangements and potential price adjustments for intragroup sales of goods and services. We involved tax professionals with specialized skills and knowledge, who assisted in evaluating (1) the Company's historical ability to accurately estimate the unrecognized tax benefits related to transfer pricing by comparing historical tax positions to subsequent settlements (2) the Company's transfer pricing documentation and methodology for compliance with applicable laws and regulations by assessing the documentation and relevant agreements, (3) the impact of new information or changes in international tax practice and developments on historical tax positions, and (4) developing an independent expectation of the unrecognized tax benefits estimate relating to current year tax positions in connection with the Company's intragroup charges and intragroup sales of goods and services and comparing the results to the Company's assessment.

/s/ KPMG AG

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

Zurich, Switzerland

February 23, 2023

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 its subsidiaries' (the Company) internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control – Integrated Framework (2013) issued by COSO.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2022 and 2021, the related consolidated 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, 2022, and the related notes (collectively, the consolidated financial statements), and our report dated February 23, 2023, expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's Board of Directors and management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying 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.

/s/ KPMG AG
Zurich, Switzerland
February 23, 2023

ABB Ltd Consolidated Income Statements

Year ended December 31 (\$ in millions, except per share data in \$)	2022	2021	2020
Sales of products	24,471	23,745	21,214
Sales of services and other	4,975	5,200	4,920
Total revenues	29,446	28,945	26,134
Cost of sales of products	(16,804)	(16,364)	(15,229)
Cost of services and other	(2,932)	(3,114)	(3,027)
Total cost of sales	(19,736)	(19,478)	(18,256)
Gross profit	9,710	9,467	7,878
Selling, general and administrative expenses	(5,132)	(5,162)	(4,895)
Non-order related research and development expenses	(1,166)	(1,219)	(1,127)
Impairment of goodwill	—	—	(311)
Other income (expense), net	(75)	2,632	48
Income from operations	3,337	5,718	1,593
Interest and dividend income	72	51	51
Interest and other finance expense	(130)	(148)	(240)
Losses from extinguishment of debt	—	—	(162)
Non-operational pension (cost) credit	115	166	(401)
Income from continuing operations before taxes	3,394	5,787	841
Income tax expense	(757)	(1,057)	(496)
Income from continuing operations, net of tax	2,637	4,730	345
Income (loss) from discontinued operations, net of tax	(43)	(80)	4,860
Net income	2,594	4,650	5,205
Net income attributable to noncontrolling interests and redeemable noncontrolling interests	(119)	(104)	(59)
Net income attributable to ABB	2,475	4,546	5,146
Amounts attributable to ABB shareholders:			
Income from continuing operations, net of tax	2,517	4,625	294
Income (loss) from discontinued operations, net of tax	(42)	(79)	4,852
Net income	2,475	4,546	5,146
Basic earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	1.33	2.31	0.14
Income (loss) from discontinued operations, net of tax	(0.02)	(0.04)	2.30
Net income	1.30	2.27	2.44
Diluted earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	1.32	2.29	0.14
Income (loss) from discontinued operations, net of tax	(0.02)	(0.04)	2.29
Net income	1.30	2.25	2.43
Weighted-average number of shares outstanding (in millions) used to compute:			
Basic earnings per share attributable to ABB shareholders	1,899	2,001	2,111
Diluted earnings per share attributable to ABB shareholders	1,910	2,019	2,119

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)	2022	2021	2020
Net income	2,594	4,650	5,205
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments:			
Foreign currency translation adjustments	(685)	(521)	498
Net loss on complete or substantially complete liquidations of foreign subsidiaries	5	—	—
Changes attributable to divestments	41	(9)	519
Foreign currency translation adjustments	(639)	(530)	1,017
Available-for-sale securities:			
Net unrealized gains (losses) arising during the year	(23)	(10)	24
Reclassification adjustments for net (gains) losses included in net income	2	(5)	(14)
Changes attributable to divestments	—	—	(3)
Unrealized gains (losses) on available-for-sale securities	(21)	(15)	7
Pension and other postretirement plans:			
Prior service credits arising during the year	—	—	43
Net actuarial gains (losses) arising during the year	226	411	(200)
Amortization of prior service credit included in net income	(16)	(14)	(11)
Amortization of net actuarial loss included in net income	44	69	88
Net losses from settlements and curtailments included in net income	9	7	518
Changes attributable to divestments	(8)	(6)	151
Pension and other postretirement plan adjustments	255	467	589
Derivative instruments and hedges:			
Net unrealized gains (losses) arising during the year	(12)	8	2
Reclassification adjustments for net (gains) losses included in net income	12	(13)	—
Changes in derivative instruments and hedges	—	(5)	2
Total other comprehensive income (loss), net of tax	(405)	(83)	1,615
Total comprehensive income, net of tax	2,189	4,567	6,820
Total comprehensive (income) loss attributable to noncontrolling interests and redeemable noncontrolling interests, net of tax	(87)	(108)	(86)
Total comprehensive income attributable to ABB, net of tax	2,102	4,459	6,734

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)	2022	2021
Cash and equivalents	4,156	4,159
Restricted cash	18	30
Marketable securities and short-term investments	725	1,170
Receivables, net	6,858	6,551
Contract assets	954	990
Inventories, net	6,028	4,880
Prepaid expenses	230	206
Other current assets	505	573
Current assets held for sale and in discontinued operations	96	136
Total current assets	19,570	18,695
Restricted cash, non-current	—	300
Property, plant and equipment, net	3,911	4,045
Operating lease right-of-use assets	841	895
Investments in equity-accounted companies	130	1,670
Prepaid pension and other employee benefits	916	892
Intangible assets, net	1,406	1,561
Goodwill	10,511	10,482
Deferred taxes	1,396	1,177
Other non-current assets	467	543
Total assets	39,148	40,260
Accounts payable, trade	4,904	4,921
Contract liabilities	2,216	1,894
Short-term debt and current maturities of long-term debt	2,535	1,384
Current operating leases	220	230
Provisions for warranties	1,028	1,005
Other provisions	1,171	1,386
Other current liabilities	4,323	4,367
Current liabilities held for sale and in discontinued operations	132	381
Total current liabilities	16,529	15,568
Long-term debt	5,143	4,177
Non-current operating leases	651	689
Pension and other employee benefits	719	1,025
Deferred taxes	729	685
Other non-current liabilities	2,085	2,116
Non-current liabilities held for sale and in discontinued operations	20	43
Total liabilities	25,876	24,303
Commitments and contingencies		
Redeemable noncontrolling interest	85	—
Stockholders' equity:		
Common stock, CHF 0.12 par value (1,965 million and 2,053 million shares issued at December 31, 2022 and 2021, respectively)	171	178
Additional paid-in capital	141	22
Retained earnings	20,082	22,477
Accumulated other comprehensive loss	(4,556)	(4,088)
Treasury stock, at cost (100 million and 95 million shares at December 31, 2022 and 2021, respectively)	(3,061)	(3,010)
Total ABB stockholders' equity	12,777	15,579
Noncontrolling interests	410	378
Total stockholders' equity	13,187	15,957
Total liabilities and stockholders' equity	39,148	40,260

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)	2022	2021	2020
Operating activities:			
Net income	2,594	4,650	5,205
Loss (income) from discontinued operations, net of tax	43	80	(4,860)
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	814	893	915
Impairment of goodwill	—	—	311
Changes in fair values of investments	(33)	(123)	(99)
Pension and other employee benefits	(125)	(216)	50
Deferred taxes	(344)	(289)	(280)
Losses from extinguishment of debt	—	—	162
Loss from equity-accounted companies	102	100	66
Net loss (gain) from derivatives and foreign exchange	(23)	49	(2)
Net gain from sale of property, plant and equipment	(84)	(38)	(37)
Net loss (gain) from sale of businesses	7	(2,193)	2
Other	66	117	90
Changes in operating assets and liabilities:			
Trade receivables, net	(831)	(142)	(100)
Contract assets and liabilities	416	29	186
Inventories, net	(1,599)	(771)	196
Accounts payable, trade	395	659	(13)
Accrued liabilities	136	454	(92)
Provisions, net	(70)	(48)	243
Income taxes payable and receivable	(94)	117	(76)
Other assets and liabilities, net	(36)	10	8
Net cash provided by operating activities — continuing operations	1,334	3,338	1,875
Net cash used in operating activities — discontinued operations	(47)	(8)	(182)
Net cash provided by operating activities	1,287	3,330	1,693
Investing activities:			
Purchases of investments	(321)	(1,528)	(5,933)
Purchases of property, plant and equipment and intangible assets	(762)	(820)	(694)
Acquisition of businesses (net of cash acquired) and increases in cost- and equity-accounted companies	(288)	(241)	(121)
Proceeds from sales of investments	697	2,272	4,341
Proceeds from maturity of investments	73	81	11
Proceeds from sales of property, plant and equipment	127	93	114
Proceeds from sales of businesses (net of transaction costs and cash disposed) and cost- and equity-accounted companies	1,541	2,958	(136)
Net cash from settlement of foreign currency derivatives	(166)	(121)	138
Changes in loans receivable, net	320	(19)	(3)
Other investing activities	(14)	(4)	11
Net cash provided by (used in) investing activities — continuing operations	1,207	2,671	(2,272)
Net cash provided by (used in) investing activities — discontinued operations	(226)	(364)	9,032
Net cash provided by investing activities	981	2,307	6,760
Financing activities:			
Net changes in debt with maturities of 90 days or less	1,366	(83)	(587)
Increase in debt	3,849	1,400	343
Repayment of debt	(2,703)	(1,538)	(3,459)
Delivery of shares	394	826	412
Purchase of treasury stock	(3,553)	(3,708)	(3,048)
Dividends paid	(1,698)	(1,726)	(1,736)
Cash associated with the spin-off of the Turbocharging Division	(172)	—	—
Dividends paid to noncontrolling shareholders	(99)	(98)	(82)
Proceeds from issuance of subsidiary shares	216	—	—
Other financing activities	6	(41)	(49)
Net cash used in financing activities — continuing operations	(2,394)	(4,968)	(8,206)
Net cash provided by financing activities — discontinued operations	—	—	31
Net cash used in financing activities	(2,394)	(4,968)	(8,175)
Effects of exchange rate changes on cash and equivalents and restricted cash	(189)	(81)	79
Net change in cash and equivalents and restricted cash	(315)	588	357
Cash and equivalents and restricted cash, beginning of period	4,489	3,901	3,544
Cash and equivalents and restricted cash, end of period	4,174	4,489	3,901
Supplementary disclosure of cash flow information:			
Interest paid	90	132	189
Income taxes paid	1,188	1,292	905

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, 2022, 2021 and 2020 (\$ 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, 2020	188	73	19,640	(5,590)	(785)	13,526	454	13,980
Adoption of accounting standard update			(82)			(82)	(9)	(91)
Net income			5,146			5,146	59	5,205
Foreign currency translation adjustments, net of tax				990		990	27	1,017
Effect of change in fair value of available-for-sale securities, net of tax				7		7		7
Unrecognized income (expense) related to pensions and other postretirement plans, net of tax				589		589		589
Change in derivative instruments and hedges, net of tax				2		2		2
Changes in noncontrolling interests		(16)				(16)	19	3
Changes in noncontrolling interests in connection with divestments						—	(138)	(138)
Dividends to noncontrolling shareholders						—	(98)	(98)
Dividends to shareholders			(1,758)			(1,758)		(1,758)
Share-based payment arrangements		54				54		54
Purchase of treasury stock					(3,181)	(3,181)		(3,181)
Delivery of shares		(24)			436	412		412
Call options		(3)				(3)		(3)
Balance at December 31, 2020	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

(1) Amounts attributable to noncontrolling interests in 2022 exclude net losses of \$5 million 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

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.

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), 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 (see Note 3).

Operating cycle

A portion of the Company's activities (primarily long-term system integration activities) has an operating cycle that exceeds one year. For classification of current assets and liabilities related to such activities, the Company elected to use the duration of the individual contracts as its operating cycle. Accordingly, there are accounts receivable, inventories and provisions related to these contracts which will not be realized within 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 used to record expected costs for employee severance in connection with restructuring programs,
- 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,
- 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. Costs associated with the sale of receivables, including the related gains and losses from the sales, are included in "Interest and other finance expense". 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, turbochargers, 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 2022 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 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).

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.

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

Business Combinations — Accounting for contract assets and contract liabilities from contracts with customers

In January 2022, the Company early adopted a new accounting standard update, which provides guidance on the accounting for revenue contracts acquired in a business combination. The update requires contract assets and liabilities acquired in a business combination to be recognized and measured at the date of acquisition in accordance with the principles for recognizing revenues from contracts with customers. The Company has applied this accounting standard update prospectively starting with acquisitions closing after January 1, 2022.

Disclosures about government assistance

In January 2022, the Company adopted a new accounting standard update, which requires entities to disclose certain types of government assistance. Under the update, the Company is required to annually disclose (i) the type of the assistance received, including any significant terms and conditions, (ii) its related accounting policy, and (iii) the effect such transactions have on its financial statements. The Company has applied this accounting standard update prospectively. This update does not have a significant impact on the Company's Consolidated Financial Statements.

Applicable for future periods

Facilitation of the effects of reference rate reform on financial reporting

In March 2020, an accounting standard update was issued 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. This update, along with clarifications outlined in subsequent updates issued during January 2021 and December 2022, can be adopted and applied no later than December 31, 2024, with early adoption permitted. The Company expects to adopt this update during the second half of 2023 and does not expect this update to have a significant impact on its Consolidated Financial Statements.

Disclosure about supplier finance program obligations

In September 2022, an accounting standard update was issued which requires entities to disclose information related to supplier finance programs. Under the update, the Company is required to annually disclose (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. This update is effective for the Company retrospectively for all in-scope transactions for annual periods beginning January 1, 2023, with the exception of the rollforward disclosures, which are effective prospectively for annual periods beginning January 1, 2024, with early adoption permitted. The Company does not expect this update to have a significant impact on its Consolidated Financial Statements. The total outstanding supplier finance obligation included in "Accounts payable, trade" in the Consolidated Balance Sheet at December 31, 2022 amounted to \$477 million.

Note 3

Discontinued operations

Divestment of the Power Grids business

On July 1, 2020, the Company completed the sale of 80.1 percent of its Power Grids business to Hitachi Ltd (Hitachi). The transaction was executed through the sale of 80.1 percent of the shares of Hitachi Energy Ltd, formerly Hitachi ABB Power Grids Ltd (Hitachi Energy). Cash consideration received at the closing date was \$9,241 million net of cash disposed. Further, for accounting purposes, the 19.9 percent ownership interest retained by the Company was deemed to have been both divested and reacquired at its fair value on July 1, 2020. The Company also obtained a put option, exercisable with three-months' notice commencing in April 2023. The combined fair value of the retained investment and the related put option amounted to \$1,779 million and was recorded as both an equity-method investment and as part of the proceeds for the sale of the entire Power Grids business (see Note 4).

In connection with the divestment, the Company recorded liabilities in discontinued operations for estimated future costs and other cash payments of \$487 million for various contractual items relating to the sale of the business, including required future cost reimbursements payable to Hitachi Energy, costs to be incurred by the Company for the direct benefit of Hitachi Energy and an amount due to Hitachi in connection with the expected purchase price finalization of the closing debt and working capital balances. In October 2021, the Company and Hitachi concluded an agreement to settle the various amounts owed by the Company. The net difference between the agreed amounts and the amounts initially estimated by the Company was recorded in 2021 in discontinued operations as an adjustment to "Net gain recognized on sale of the Power Grids business" in the table below. During 2022, 2021 and 2020, total cash payments (including the amounts paid under the settlement agreement) of \$102 million, \$364 million and \$33 million, respectively, were made in connection with these liabilities. At December 31, 2022, the remaining amount recorded was \$53 million.

As a result of the Power Grids sale, the Company recognized an initial net gain of \$5,141 million, net of transaction costs, for the sale of the entire Power Grids business in Income from discontinued operations, net of tax, in 2020. Included in the calculation of the net gain was a cumulative translation loss relating to the Power Grids business of \$420 million which was reclassified from Accumulated other comprehensive loss (see Note 21). Certain amounts included in the net gain were estimated or otherwise subject to change in value and in 2021 the Company recorded adjustments, including the agreed settlement amount referred to above, reducing the total net gain by \$65 million and in 2022 such adjustments reduced the gain by a further \$10 million. Certain remaining minor obligations relating to the divestment continue to be subject to uncertainty and will be adjusted in future periods but these adjustments are not expected to have a material impact on the Consolidated Financial Statements.

In 2020, the Company recorded \$262 million in Income tax expense within discontinued operations in connection with the reorganization of the legal entity structure of the Power Grids business required to facilitate the sale.

In connection with the divestment, the Company recognized liabilities in discontinued operations for certain indemnities (see Note 15 for additional information) and also recorded an initial liability of \$258 million representing the fair value of the right granted to Hitachi Energy for the use of the ABB brand for up to 8 years.

Upon closing of the sale, the Company entered into various transition services agreements (TSAs). Pursuant to these TSAs, the Company and Hitachi Energy provide to each other, on an interim, transitional basis, various services. The services provided by the Company primarily include finance, information technology, human resources and certain other administrative services. Under the current terms, the TSAs will continue for up to 3 years, and can only be extended on an exceptional basis for business-critical services for an additional period which is reasonably necessary to avoid a material adverse impact on the business. In 2022, 2021 and 2020, the Company recognized within its continuing operations, general and administrative expenses incurred to perform the TSAs, offset by \$162 million, \$173 million and \$91 million, respectively, in TSA-related income for such services that is reported in Other income (expense), net.

Discontinued operations

As a result of the sale of the Power Grids business, 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 the Company's operations and financial results, the results of operations for this business have been presented as discontinued operations and the assets and liabilities are presented as held for sale and in discontinued operations for all periods presented. 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. Assets and liabilities relating to, as well as the net financial results of, these contracts will continue to be included in discontinued operations until they have been completed or otherwise transferred to Hitachi Energy.

Prior to the divestment, interest expense that was not directly attributable to or related to the Company's continuing business or discontinued business was allocated to discontinued operations based on the ratio of net assets to be sold less debt that was 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 was not allocated to discontinued operations.

Operating results of the discontinued operations are summarized as follows:

(\$ in millions)	2022	2021	2020
Total revenues	—	—	4,008
Total cost of sales	—	—	(3,058)
Gross profit	—	—	950
Expenses	(38)	(18)	(808)
Change to net gain recognized on sale of the Power Grids business	(10)	(65)	5,141
Income (loss) from operations	(48)	(83)	5,282
Net interest income (expense) and other finance expense	—	2	(5)
Non-operational pension (cost) credit	—	—	(94)
Income (loss) from discontinued operations before taxes	(48)	(81)	5,182
Income tax	5	1	(322)
Income (loss) from discontinued operations, net of tax	(43)	(80)	4,860

Of the total Income (loss) from discontinued operations before taxes in the table above, \$(47) million, \$(80) million and \$5,170 million in 2022, 2021 and 2020, respectively, are attributable to the Company, while the remainder is attributable to noncontrolling interests.

Until the date of the divestment, Income (loss) from discontinued operations before taxes excluded stranded costs which were previously able to be allocated to the Power Grids operating segment. As a result, \$40 million in 2020 of allocated overhead and other management costs which were previously included in the measure of segment profit for the Power Grids operating segment are now reported as part of Corporate and Other. In the table above, Net interest income (expense) and other finance expense in 2020 includes \$20 million of interest expense which has been recorded on an allocated basis in accordance with the Company's accounting policy election until the divestment date.

Included in the reported Total revenues of the Company for 2020 are revenues for sales from the Company's operating segments to the Power Grids business of \$108 million which represent intercompany transactions that, prior to Power Grids being classified as a discontinued operation, were eliminated in the Company's Consolidated Financial Statements (see Note 23). Subsequent to the divestment, sales to Hitachi Energy are reported as third-party revenues.

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 Income (loss) from discontinued operations, net of tax, above.

The major components of assets and liabilities held for sale and in discontinued operations in the Company's Consolidated Balance Sheets are summarized as follows:

December 31, 2022 (\$ in millions)	2022⁽¹⁾	2021⁽¹⁾
Receivables, net	92	131
Other current assets	4	5
Current assets held for sale and in discontinued operations	96	136
Accounts payable, trade	44	71
Other liabilities	88	310
Current liabilities held for sale and in discontinued operations	132	381
Other non-current liabilities	20	43
Non-current liabilities held for sale and in discontinued operations	20	43

(1) At December 31, 2022 and 2021, the balances reported as held for sale and in discontinued operations pertain to Power Grids activities and other obligations which will remain with the Company until such time as the obligation is settled or the activities are fully wound down.

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)	2022	2021	2020
Purchase price for acquisitions (net of cash acquired) ⁽¹⁾	195	212	79
Aggregate excess of purchase price over fair value of net assets acquired ⁽²⁾	229	161	92
Number of acquired businesses	5	2	3

(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 2020, 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 Division of its Electrification 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. 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

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, 2021 and 2020 Income continuing operations before taxes, included income of \$134 million, \$186 million and \$139 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. Certain amounts included in the net gain for the sale of the Dodge business 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. In 2021 and 2020 Income from continuing operations before taxes, included net income of \$115 million and \$96 million, respectively, from the Dodge business which, prior to its sale was part of the Company's Motion operating segment.

In 2020, the Company completed the sale of its Power Grids business (see Note 3 for details) and its solar inverters business.

Divestment of the solar inverters business

In February 2020, the Company completed the sale of its solar inverters business for no consideration. Under the agreement, which was reached in July 2019, the Company was required to transfer \$143 million of cash to the buyer on the closing date. In addition, payments totaling EUR 132 million (\$145 million) are required to be transferred to the buyer from 2020 through 2025. In 2019, the Company recorded a loss of \$421 million, in Other income (expense), net, representing the excess of the carrying value, which includes a loss of \$99 million arising from the cumulative translation adjustment, over the estimated fair value of this business. In 2020, a further loss of \$33 million was recorded in Other income (expense), net for changes in fair value of this business. The loss in 2020 includes the \$99 million reclassification from other comprehensive income of the currency translation adjustment related to the business.

The fair value was based on the estimated current market values using Level 3 inputs, considering the agreed-upon sale terms with the buyer. The solar inverters business, which includes the solar inverter business acquired as part of the Power-One acquisition in 2013, was part of the Company's Electrification operating segment.

As this divestment does not qualify as a discontinued operation, the results of operations for this business prior to its disposal are included in the Company's continuing operations for all periods presented.

Including the above loss of \$33 million in 2020, Income from continuing operations before taxes includes net losses of \$63 million, from the solar inverters business.

Investments in equity-accounted companies

In connection with the divestment of its Power Grids business to Hitachi in 2020 (see Note 3), the Company retained a 19.9 percent interest in the business. For accounting purposes the 19.9 percent interest was deemed to have been both divested and reacquired, with a fair value at the transaction date of \$1,661 million. The fair value was based on a discounted cash flow model considering the expected results of the future business operations of Hitachi Energy and using relevant market inputs including a risk-adjusted weighted-average cost of capital.

The Company also obtained an option, exercisable with three-months' notice commencing April 2023, granting it the right to require Hitachi to purchase this investment at fair value, subject to a minimum floor price equivalent to a 10 percent discount compared to the price paid for the initial 80.1 percent. This option was initially valued at \$118 million using a standard option pricing model with inputs considering the nature of the investment and the expected period until option exercise. As this option is not separable from the investment the value has been combined with the value of the underlying investment and is accounted for together. Hitachi also received a call option requiring the Company to sell the remaining 19.9 percent interest in Hitachi Energy at any time 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, 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 July 2020, the Company concluded that based on its continuing involvement with the Power Grids business, including the membership in its governing board of directors, it had significant influence over Hitachi Energy. As a result, the investment (including the value of the option) was accounted for using the equity method through the date of its sale in December 2022.

The difference between the initial carrying value of the Company's investment in Hitachi Energy at fair value and its proportionate share of the underlying net assets created basis differences of \$8,570 million (\$1,705 million for the Company's 19.9 percent ownership), which were allocated as follows:

(\$ in millions)	Allocated amounts	Weighted-average useful life
Inventories	169	5 months
Order backlog	727	2 years
Property, plant and equipment ⁽¹⁾	1,016	
Intangible assets ⁽²⁾	1,731	9 years
Other contractual rights	251	2 years
Other assets	43	
Deferred tax liabilities	(942)	
Goodwill	6,026	
Less: Amount attributed to noncontrolling interest	(451)	
Basis difference	8,570	

- (1) Property, plant and equipment includes assets subject to amortization having an initial fair value difference of \$686 million and a weighted-average useful life of 14 years.
- (2) Intangible assets include brand license agreement, technology and customer relationships.

For assets subject to depreciation or amortization, the Company amortizes these basis differences over the estimated remaining useful lives of the assets that gave rise to this difference, recording the amortization, net of related deferred tax benefit, as a reduction of income from equity-accounted companies. Certain other assets are recorded as an expense as the benefits from the assets are realized. At December 31, 2022, the Company determined that no impairment of its equity-accounted investments existed.

The carrying value of the Company's investments in equity-accounted companies and respective percentage of ownership is as follows:

(\$ in millions, except ownership share in %)	Ownership as of December 31, 2021	Carrying value at December 31,	
		2022	2021
Hitachi Energy Ltd	19.9%	—	1,609
Others		130	61
Total		130	1,670

In 2022, 2021 and 2020, 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)	2022	2021	2020
Income (loss) from equity-accounted companies, net of taxes	(22)	38	29
Basis difference amortization (net of deferred income tax benefit)	(80)	(138)	(95)
Loss from equity-accounted companies	(102)	(100)	(66)

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, 2022 (\$ in millions)	Cost basis	Gross unrealized gains	Gross unrealized losses	Fair value	Cash and equivalents	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	

December 31, 2021 (\$ in millions)	Cost basis	Gross unrealized gains	Gross unrealized losses	Fair value	Cash and equivalents	Marketable securities and short-term investments
Changes in fair value recorded in net income						
Cash	2,752			2,752	2,752	
Time deposits	2,037			2,037	1,737	300
Equity securities	569	18		587		587
	5,358	18	—	5,376	4,489	887
Changes in fair value recorded in other comprehensive income						
Debt securities available-for-sale:						
—U.S. government obligations	203	7	(1)	209		209
—Corporate	74	1	(1)	74		74
	277	8	(2)	283	—	283
Total	5,635	26	(2)	5,659	4,489	1,170
Of which:						
—Restricted cash, current					30	
—Restricted cash, non-current					300	

Contractual maturities

Contractual maturities of debt securities consisted of the following:

December 31, 2022 (\$ in millions)	Available-for-sale	
	Cost basis	Fair value
Less than one year	139	138
One to five years	157	148
Six to ten years	90	80
Due after ten years	4	4
Total	390	370

At December 31, 2022 and 2021, the Company pledged \$69 million and \$66 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, interest rate and equity 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.

Equity risk

The Company is exposed to fluctuations in the fair value of its warrant appreciation rights (WARs) issued under its Management Incentive Plan (MIP) (see Note 18). A WAR gives its holder the right to receive cash equal to the market price of an equivalent listed warrant on the date of exercise. To eliminate such risk, the Company has purchased cash-settled call options, indexed to the shares of the Company, which entitle the Company to receive amounts equivalent to its obligations under the outstanding WARs.

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 (\$ in millions)	Total notional amounts at December 31,		
	2022	2021	2020
Foreign exchange contracts	13,509	11,276	12,610
Embedded foreign exchange derivatives	933	815	1,134
Cross-currency interest rate swaps	855	906	—
Interest rate contracts	2,830	3,541	3,227

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 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:

Type of derivative	Unit	Total notional amounts at December 31,		
		2022	2021	2020
Copper swaps	metric tonnes	29,281	36,017	39,390
Silver swaps	ounces	2,012,213	2,842,533	1,966,677
Aluminum swaps	metric tonnes	6,825	7,125	8,112

Equity derivatives

At December 31, 2022, 2021 and 2020, the Company held 8 million, 9 million and 22 million cash-settled call options indexed to ABB Ltd shares (conversion ratio 5:1) with a total fair value of \$15 million, \$29 million and \$21 million, respectively.

Cash flow hedges

As noted above, the Company mainly uses forward foreign exchange contracts to manage the foreign exchange risk of its operations, commodity swaps to manage its commodity risks and cash-settled call options to hedge its WAR liabilities. 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 2022, 2021 and 2020, 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)		2022	2021	2020
Gains (losses) recognized in Interest and other finance expense:				
Interest rate contracts	Designated as fair value hedges	(91)	(55)	11
	Hedged item	93	56	(11)
Cross-currency interest rate swaps	Designated as fair value hedges	(134)	(37)	—
	Hedged item	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	2022	2021	2020
Foreign exchange contracts	Total revenues	(56)	3	94
	Total cost of sales	21	(53)	—
	SG&A expenses ⁽¹⁾	27	11	(11)
	Non-order related research and development	—	(2)	(2)
	Interest and other finance expense	(128)	(173)	207
Embedded foreign exchange contracts	Total revenues	(3)	(7)	(34)
	Total cost of sales	(11)	(2)	(1)
Commodity contracts	Total cost of sales	(47)	78	56
Other	Interest and other finance expense	4	—	1
Total		(193)	(145)	310

(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	
	Current in "Other current assets"	Non-current in "Other non-current assets"	Current in "Other current liabilities"	Non-current in "Other non-current liabilities"
December 31, 2022 (\$ in millions)				
Derivatives designated as hedging instruments:				
Foreign exchange contracts	—	—	4	4
Interest rate contracts	—	—	5	57
Cross-currency interest rate swaps	—	—	—	288
Cash-settled call options	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

	Derivative assets		Derivative liabilities	
	Current in "Other current assets"	Non-current in "Other non-current assets"	Current in "Other current liabilities"	Non-current in "Other non-current liabilities"
December 31, 2021 (\$ in millions)				
Derivatives designated as hedging instruments:				
Foreign exchange contracts	—	—	3	5
Interest rate contracts	9	20	—	—
Cross-currency interest rate swaps	—	—	—	109
Cash-settled call options	29	—	—	—
Total	38	20	3	114
Derivatives not designated as hedging instruments:				
Foreign exchange contracts	108	14	107	7
Commodity contracts	19	—	5	—
Interest rate contracts	1	—	2	—
Embedded foreign exchange derivatives	10	7	16	10
Total	138	21	130	17
Total fair value	176	41	133	131

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, 2022 and 2021, 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, 2022 and 2021, information related to these offsetting arrangements was as follows:

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

December 31, 2021 (\$ 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	200	(104)	—	—	96
Total	200	(104)	—	—	96

December 31, 2021 (\$ 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	238	(104)	—	—	134
Total	238	(104)	—	—	134

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, 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

December 31, 2021 (\$ in millions)	Level 1	Level 2	Level 3	Total fair value
Assets				
Securities in "Marketable securities and short-term investments":				
Equity securities		587		587
Debt securities—U.S. government obligations	209			209
Debt securities—Corporate		74		74
Derivative assets—current in "Other current assets"		176		176
Derivative assets—non-current in "Other non-current assets"		41		41
Total	209	878	—	1,087
Liabilities				
Derivative liabilities—current in "Other current liabilities"		133		133
Derivative liabilities—non-current in "Other non-current liabilities"		131		131
Total	—	264	—	264

During 2022, 2021 and 2020 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. Cash-settled call options hedging the Company's WAR liability are valued based on bid prices of the equivalent listed warrant. 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

The Company elects to record private equity investments without readily determinable fair values at cost, less impairment, adjusted for observable price changes. The Company reassesses at each reporting period whether these investments continue to qualify for this treatment. In 2022 and 2021, the Company recognized, in Other income (expense), net, net fair value gains of \$52 million and \$108 million, respectively, related to certain of its private equity investments based on observable market price changes for an identical or similar investment of the same issuer. The fair values were determined using Level 2 inputs. The carrying values of these investments at December 31, 2022 and 2021, totaled \$106 million and \$169 million, respectively.

Based on valuations at July 1, 2020, the Company recorded goodwill impairment charges of \$311 million in the third quarter of 2020. The fair value measurements used in the analyses were calculated using the income approach (discounted cash flow method). The discounted cash flow models were calculated using unobservable inputs, which classified the fair value measurement as Level 3 (see Note 11 for additional information including further detailed information related to these charges and significant unobservable inputs).

Apart from the transactions above, there were no additional significant non-recurring fair value measurements during 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, 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

December 31, 2021 (\$ 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	2,422	2,422			2,422
Time deposits	1,737		1,737		1,737
Restricted cash	30	30			30
Marketable securities and short-term investments (excluding securities):					
Time deposits	300		300		300
Restricted cash, non-current	300	300			300
Liabilities					
Short-term debt and current maturities of long-term debt (excluding finance lease obligations)	1,357	1,288	69		1,357
Long-term debt (excluding finance lease obligations)	4,043	4,234	58		4,292

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, current and non-current, 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)	2022	2021
Trade receivables	6,478	6,206
Other receivables	688	684
Allowance	(308)	(339)
Total	6,858	6,551

“Trade receivables” in the table above includes contractual retention amounts billed to customers of \$100 million and \$119 million at December 31, 2022 and 2021, 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, 2022, 52 percent and 34 percent are expected to be collected in 2023 and 2024, 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)	2022	2021	2020
Balance at January 1,	339	357	228
Transition adjustment	—	—	56
Current-period provision for expected credit losses	37	33	115
Write-offs charged against the allowance	(48)	(37)	(42)
Exchange rate differences	(20)	(14)	—
Balance at December 31,	308	339	357

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

December 31, (\$ in millions)	2022	2021	2020
Contract assets	954	990	985
Contract liabilities	2,216	1,894	1,903

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. In addition to the amounts presented as Contract liabilities in the table above, \$59 million are non-current and are included in Other non-current liabilities in the Balance Sheet.

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

(\$ in millions)	2022		2021	
	Contract assets	Contract liabilities	Contract assets	Contract liabilities
Revenue recognized, which was included in the Contract liabilities balance at January 1, 2022/2021		(1,043)		(1,086)
Additions to Contract liabilities - excluding amounts recognized as revenue during the period		1,481		1,136
Receivables recognized that were included in the Contract assets balance at January 1, 2022/2021	(591)		(566)	

The Company considers its order backlog to represent its unsatisfied performance obligations. At December 31, 2022, the Company had unsatisfied performance obligations totaling \$19,867 million and, of this amount, the Company expects to fulfill approximately 77 percent of the obligations in 2023, approximately 13 percent of the obligations in 2024 and the balance thereafter.

Note 9 Inventories, net

"Inventories, net" consisted of the following:

December 31, (\$ in millions)	2022	2021
Raw materials	2,626	2,136
Work in process	1,189	995
Finished goods	2,036	1,594
Advances to suppliers	177	155
Total	6,028	4,880

Note 10 Property, plant and equipment, net

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

December 31, (\$ in millions)	2022	2021
Land and buildings	3,622	3,925
Machinery and equipment	5,495	5,785
Construction in progress	586	522
	9,703	10,232
Accumulated depreciation	(5,792)	(6,187)
Total	3,911	4,045

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

December 31, (\$ in millions)	2022	2021
Land and buildings	178	164
Machinery and equipment	135	92
	313	256
Accumulated depreciation	(135)	(123)
Total	178	133

In 2022, 2021 and 2020 depreciation, including depreciation of assets under finance leases, was \$531 million, \$575 million and \$586 million, respectively. In 2022, 2021 and 2020 there were no significant impairments of property, plant or equipment.

Note 11

Goodwill and intangible assets

The changes in “Goodwill” were as follows:

(\$ in millions)	Electrification	Motion	Process Automation	Robotics & Discrete Automation	Total
Balance at January 1, 2021	4,527	2,456	1,639	2,228	10,850
Goodwill acquired during the year	11	—	—	150	161
Goodwill allocated to disposals	—	(338)	(7)	—	(345)
Exchange rate differences and other	(66)	(1)	(19)	(98)	(184)
Balance at December 31, 2021⁽¹⁾	4,472	2,117	1,613	2,280	10,482
Goodwill acquired during the year	220	9	—	—	229
Goodwill allocated to disposals ⁽²⁾	(2)	—	(6)	—	(8)
Exchange rate differences and other	(92)	(8)	(20)	(72)	(192)
Balance at December 31, 2022⁽¹⁾	4,598	2,118	1,587	2,208	10,511

- (1) At December 31, 2022 and 2021, the gross goodwill amounted to \$10,774 million and \$10,760 million, respectively. The accumulated impairment charges amounted to \$263 million and \$278 million, respectively, and related to the Robotics & Discrete Automation segment.
- (2) Includes goodwill of \$6 million relating to the Turbocharging Division which, prior to its spin-off, was included in the Process Automation operating segment.

The Company adopted a new operating model on July 1, 2020, which resulted in a change to the goodwill reporting units being identified at the Division level. As a result of the new allocation of goodwill, an interim quantitative impairment test was conducted both before and after the changes which were effective July 1, 2020. The interim quantitative impairment test indicated that the estimated fair values of the reporting units were substantially in excess of their carrying value for all reporting units except for the Machine Automation reporting unit within the Robotics & Discrete Automation operating segment. With the fair value of the reporting unit lower due to the economic conditions, the existing book value of the intangible assets combined with the newly allocated reporting unit goodwill led to the carrying value of the Machine Automation reporting unit exceeding its fair value. During 2020, a goodwill impairment charge of \$290 million was recorded to reduce the carrying value of this reporting unit to its implied fair value.

During 2022 and 2021, certain reporting units were split into separate reporting units. For each change, an interim quantitative impairment test was conducted before and after the change and in all cases, it was concluded that the fair value of the relevant reporting units exceeded the carrying value by a significant amount.

At October 1, 2022 and 2021, respectively, the Company performed qualitative assessments and determined that it was not more likely than not that the fair value for each of the reporting units was below the carrying value. As a result, the Company concluded that it was not necessary to perform the quantitative impairment test.

Intangible assets, net consisted of the following:

December 31, (\$ in millions)	2022			2021		
	Gross carrying amount	Accumulated amortization	Net carrying amount	Gross carrying amount	Accumulated amortization	Net carrying amount
Capitalized software for internal use	830	(720)	110	835	(732)	103
Capitalized software for sale	26	(26)	—	31	(29)	2
Intangibles other than software:						
Customer-related	1,743	(808)	935	1,716	(707)	1,009
Technology-related	997	(812)	185	1,122	(868)	254
Marketing-related	498	(347)	151	493	(327)	166
Other	55	(30)	25	56	(29)	27
Total	4,149	(2,743)	1,406	4,253	(2,692)	1,561

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

(\$ in millions)	2022	2021
Capitalized software for internal use	53	32
Capitalized software for sale	—	2
Intangibles other than software:		
Customer-related	79	13
Technology-related	16	35
Marketing-related	20	11
Other	7	2
Total	175	95

There were no significant intangible assets acquired in business combinations in 2021. Included in the additions of \$175 million in 2022 are intangible assets of \$116 million acquired in business combinations, primarily consisting of customer-related and marketing-related intangibles.

Amortization expense of intangible assets consisted of the following:

(\$ in millions)	2022	2021	2020
Capitalized software for internal use	52	66	61
Intangibles other than software	230	252	268
Total	282	318	329

In 2022, 2021 and 2020 impairment charges on intangible assets were not significant.

At December 31, 2022, future amortization expense of intangible assets is estimated to be:

(\$ in millions)	
2023	296
2024	221
2025	174
2026	153
2027	145
Thereafter	417
Total	1,406

Note 12 Debt

The Company's total debt at December 31, 2022 and 2021, amounted to \$7,678 million and \$5,561 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)	2022	2021
Short-term debt (weighted-average interest rate of 1.9% and 3.2%, respectively)	1,448	78
Current maturities of long-term debt (weighted-average nominal interest rate of 0.5% and 2.8%, respectively)	1,087	1,306
Total	2,535	1,384

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

At December 31, 2022, 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 and no amount was outstanding under the \$2 billion program in the United States. At December 31, 2021, no amount was outstanding under either program.

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. Interest costs on drawings under the facility are LIBOR (for drawings in currencies for which LIBOR is still published) and EURIBOR for EURO drawings, 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, or 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, 2022 and 2021, under this facility.

The Company amended and restated its facility in February 2023 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, subject to applicable credit adjustment spreads.

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:

December 31, (\$ in millions, except % data)	2022			2021		
	Balance	Nominal rate	Effective rate	Balance	Nominal rate	Effective rate
Floating rate	3,459	0.4%	2.8%	3,598	1.2%	0.3%
Fixed rate	2,771	2.2%	2.2%	1,885	3.0%	3.1%
	6,230			5,483		
Current portion of long-term debt	(1,087)	0.5%	1.5%	(1,306)	2.8%	1.0%
Total	5,143			4,177		

At December 31, 2022, the principal amounts of long-term debt repayable (excluding finance lease obligations) at maturity were as follows:

(\$ in millions)	
2023	1,058
2024	2,387
2025	193
2026	—
2027	461
Thereafter	2,194
Total	6,293

Details of outstanding bonds were as follows:

December 31, (in millions)	2022			2021			
	Nominal outstanding		Carrying value ⁽¹⁾	Nominal outstanding		Carrying value ⁽¹⁾	
Bonds:							
2.875% USD Notes, due 2022				—	USD	1,250	\$ 1,258
0.625% EUR Instruments, due 2023	EUR	700	\$	742	EUR	700	\$ 800
0% CHF Bonds, due 2023	CHF	275	\$	298			—
0.625% EUR Instruments, due 2024	EUR	700	\$	720			—
Floating Rate EUR Instruments, due 2024	EUR	500	\$	536			—
0.75% EUR Instruments, due 2024	EUR	750	\$	769	EUR	750	\$ 860
0.3% CHF Bonds, due 2024	CHF	280	\$	303	CHF	280	\$ 306
2.1% CHF Bonds, due 2025	CHF	150	\$	162			—
0.75% CHF Bonds, due 2027	CHF	425	\$	460			—
3.8% USD Notes, due 2028 ⁽²⁾	USD	383	\$	381	USD	383	\$ 381
1.0% CHF Bonds, due 2029	CHF	170	\$	184	CHF	170	\$ 186
0% EUR Instruments, due 2030	EUR	800	\$	677	EUR	800	\$ 862
2.375% CHF Bonds, due 2030	CHF	150	\$	162			—
4.375% USD Notes, due 2042 ⁽²⁾	USD	609	\$	590	USD	609	\$ 589
Total			\$	5.984			\$ 5.242

(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 2022, the Company repaid at maturity its 2.875% USD Notes, which paid interest semi-annually in arrears. The Company had entered into interest rate swaps for an aggregate nominal amount of \$1,050 million to partially hedge its interest obligations on these Notes and after considering the impact of such swaps, \$1,050 million of the outstanding principal at December 31, 2021, is shown as floating rate debt, in the table of long-term debt above.

During 2020, in connection with exercising certain early redemption options on the \$250 million 5.625% USD Notes, due 2021, and \$450 million 3.375% USD Notes, due 2023, and the partial redemption through a cash tender offer of the 3.8% USD Notes, due 2028, and 4.375% USD Notes, due 2042, the Company recognized losses on extinguishment of debt of \$162 million, representing the premium associated with the early redemption, as well as the recognition of the relevant remaining unamortized issuance premium or discounts and issuance costs.

The 0.625% EUR Instruments, due 2023, pay interest annually in arrears at a fixed rate of 0.625 percent per annum. The Company may redeem these notes up to three months prior to maturity (Par call 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 note terms, plus interest accrued at the redemption date. The Company may redeem these instruments in whole or in part, 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 became floating rate euro obligations and consequently have been shown as floating rate debt, in the table of long-term debt above.

The 0.75% EUR Instruments, due 2024, pay interest annually in arrears at a fixed rate of 0.75 percent per annum and have the same early redemption terms as the 0.625% EUR Instruments above. The Company entered into interest rate swaps to modify the characteristics of these bonds. After considering the impact of such swaps, these bonds effectively became 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 3.8% USD Notes, due 2028, were issued in April 2018, along with \$300 million of 2.8% USD Notes, due 2020, and \$450 million of 3.375% USD Notes, due 2023, each paying interest semi-annually in arrears. The 2020 Notes were repaid at maturity in October 2020 and the 2023 Notes were redeemed early in full in December 2020. 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. 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. 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 0.625% 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. 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. 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.

In March 2022, the Company issued the following CHF bonds: (i) CHF 275 million zero interest Bonds, due 2023, and (ii) CHF 425 million Bonds, due 2027, with a coupon of 0.75 percent payable annually in arrears. The Company may redeem the CHF 425 million 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 aggregate net proceeds of these CHF bond issues, after discount and fees, amounted to CHF 699 million (equivalent to approximately \$751 million on date of issuance).

Also in March 2022, the Company issued the following EUR Instruments, 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. In relation to these EUR Instruments, the Company recorded net proceeds (after the respective discount and premium, as well as fees) of EUR 1,203 million (equivalent to \$1,335 million on the date of issuance). 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.

In October 2022, the Company issued the following CHF bonds: (i) CHF 150 million 2.1 percent Bonds, due 2025, and (ii) CHF 150 million 2.375 percent Bonds, due 2030. Each of the respective bonds pays 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 aggregate net proceeds of these CHF bond issues, after underwriting discount and other fees, amounted to CHF 299 million (equivalent to approximately \$304 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, 2022 and 2021, 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)	2022	2021
Contract-related provisions	615	762
Provision for insurance-related reserves	171	174
Restructuring and restructuring-related provisions	145	188
Provisions for contractual penalties and compliance and litigation matters	49	63
Other	191	199
Total	1,171	1,386

“Other current liabilities” consisted of the following:

December 31, (\$ in millions)	2022	2021
Employee-related liabilities	1,490	1,547
Accrued expenses	872	768
Non-trade payables	681	644
Accrued customer rebates	315	322
Income taxes payable	312	378
Other tax liabilities	285	298
Derivative liabilities (see Note 6)	121	133
Deferred income	102	95
Pension and other employee benefits	38	41
Accrued interest	38	28
Other	69	113
Total	4,323	4,367

“Other non-current liabilities” consisted of the following:

December 31, (\$ in millions)	2022	2021
Income tax related liabilities	1,287	1,458
Derivative liabilities (see Note 6)	367	130
Provisions for contractual penalties and compliance and litigation matters	67	129
Contract liabilities (see Note 8)	59	—
Employee-related liabilities	45	59
Environmental provisions	42	39
Deferred income	33	74
Other	185	227
Total	2,085	2,116

Note 14

Leases

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

(\$ in millions)	Land and buildings			Machinery and equipment			Total		
	2022	2021	2020	2022	2021	2020	2022	2021	2020
Operating lease cost	217	240	287	71	73	89	288	313	376
Finance lease cost	15	17	13	22	20	16	37	37	29
Short-term lease cost	20	26	17	18	14	31	38	40	48
Sub-lease income	(18)	(24)	(20)	(1)	(1)	(1)	(19)	(25)	(21)
Total lease expense	234	259	297	110	106	135	344	365	432

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

(\$ in millions)	Land and buildings			Machinery and equipment			Total		
	2022	2021	2020	2022	2021	2020	2022	2021	2020
Operating leases:									
Cash paid under operating cash flows	200	223	263	66	68	83	266	291	346
Right-of-use assets obtained in exchange for new liabilities	285	267	266	50	86	57	335	353	323

In 2022, 2021 and 2020 the cash flow amounts under finance leases were not significant.

At December 31, 2022, 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:

(\$ in millions)	Operating Leases		Finance Leases	
	Land and buildings	Machinery and equipment	Land and buildings	Machinery and equipment
2023	203	54	21	23
2024	168	34	21	20
2025	138	18	21	17
2026	104	6	17	6
2027	70	1	17	1
Thereafter	151	1	68	—
Total minimum lease payments	834	114	165	67
Difference between undiscounted cash flows and discounted cash flows	(74)	(3)	(27)	(3)
Present value of minimum lease payments	760	111	138	64

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

	Land and buildings			Machinery and equipment		
	2022	2021	2020	2022	2021	2020
Operating leases:						
Weighted-average remaining term (months)	73	73	84	31	30	29
Weighted-average discount rate	3.3%	2.6%	3.0%	1.9%	1.9%	2.0%
Finance leases:						
Weighted-average remaining term (months)	135	100	107	33	40	40
Weighted-average discount rate	5.5%	7.7%	7.7%	2.3%	1.8%	2.3%

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, 2022, amounts to \$35 million and \$167 million, respectively, and at December 31, 2021, amounts to \$27 million and \$134 million, respectively.

Note 15

Commitments and contingencies

Contingencies—Regulatory, Compliance and Legal

Regulatory

As a result of an internal investigation, the Company self-reported to the Securities and Exchange Commission (SEC) and the Department of Justice (DoJ) in the United States as well as to the Serious Fraud Office (SFO) in the United Kingdom concerning certain of its past dealings with Unaoil and its subsidiaries, including alleged improper payments made by these entities to third parties. In May 2020, the SFO closed its investigation, which it originally announced in February 2017, as the case did not meet the relevant test for prosecution and in December 2022 this matter was closed without action by the DOJ as part of the Kusile settlement.

Based on findings during an internal investigation, the Company self-reported to the SEC and the 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, 2022 and 2021, the Company had aggregate liabilities of \$86 million and \$104 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.

December 31, (\$ in millions)	Maximum potential payments ⁽¹⁾	
	2022	2021
Performance guarantees	4,300	4,540
Financial guarantees	96	52
Indemnification guarantees ⁽²⁾	—	136
Total	4,396	4,728

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

(2) Certain indemnifications provided to Hitachi in connection with the divestment of Power Grids are without limit.

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, 2022 and 2021, amounted to \$1 million and \$156 million, respectively, the majority of which in 2021 is included in discontinued operations.

The Company is party to various guarantees providing financial or performance assurances to certain third parties. These guarantees, which have various maturities up to 2035, 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, 2022 and 2021, the maximum potential payable under these guarantees amounts to \$843 million and \$911 million, respectively, and these guarantees have various maturities ranging from five to ten years.

The Company retained obligations for financial, performance and indemnification guarantees related to the sale of the Power Grids business (see Note 3 for details). The performance and financial guarantees have been indemnified by Hitachi at the same proportion of its ownership in Hitachi Energy Ltd, (increasing from 80.1 percent at December 31, 2021, to 100 percent at December 31, 2022). These guarantees, which have various maturities up to 2035, 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, 2022 and 2021, is approximately \$3.0 billion and \$3.2 billion, respectively. On completing the sale of the Company's remaining 19.9 percent interest in Hitachi Energy to Hitachi, 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, 2022 and 2021, the total outstanding performance bonds aggregated to \$2.9 billion and \$3.6 billion, respectively; of each of these amounts, \$0.1 billion relates to discontinued operations. There have been no significant amounts reimbursed to financial institutions under these types of arrangements in 2022 and 2021.

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)	2022	2021	2020
Balance at January 1,	1,005	1,035	816
Net change in warranties due to acquisitions, divestments, spin-offs and liabilities held for sale ⁽¹⁾	(24)	1	8
Claims paid in cash or in kind	(157)	(222)	(209)
Net increase in provision for changes in estimates, warranties issued and warranties expired	252	226	369
Exchange rate differences	(48)	(35)	51
Balance at December 31,	1,028	1,005	1,035

(1) Includes adjustments to the initial purchase price allocation recorded during the measurement period.

In 2020, the Company determined that the provision for a product warranty related to a divested business was no longer sufficient to cover expected warranty costs in the remaining warranty period. Due to an unexpected level of product failure, the previously estimated product warranty provision was increased by \$143 million during 2020. The corresponding increase was included in “Cost of sales of products”. As these costs relate to a divested business, in accordance with the definition of the Company’s primary measure of segment performance, Operational EBITA (see Note 23), the costs have been excluded from this measure.

The warranty liability has been recorded based on the information currently available and is subject to change in the future.

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)	2022	2021	2020
Current taxes	1,101	1,346	776
Deferred taxes	(344)	(289)	(280)
Income tax expense allocated to continuing operations	757	1,057	496
Income tax expense (benefit) allocated to discontinued operations	(5)	(1)	322

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)	2022	2021	2020
Income from continuing operations before income taxes	3,394	5,787	841
Weighted-average global tax rate	23.6%	23.7%	22.9%
Income taxes at weighted-average tax rate	800	1,371	193
Items taxed at rates other than the weighted-average tax rate	127	176	3
Unrecognized tax benefits	(83)	151	(38)
Changes in valuation allowance, net	(195)	(95)	29
Effects of changes in tax laws and enacted tax rates	(19)	1	23
Non-deductible / non-taxable items	97	(542)	232
Other, net	30	(5)	54
Income tax expense from continuing operations	757	1,057	496
Effective tax rate for the year	22.3%	18.3%	59.0%

The allocation of consolidated income from continuing operations, which is predominantly earned outside of Switzerland, impacts the “weighted-average global tax rate”. In 2021, gains on sales of businesses increased the weighted-average global tax rate by approximately 1 percent.

In 2022, “Items taxed at rates other than the weighted-average tax rate” included \$53 million for dividends received in holding entities which could not fully benefit from the participation exemption. In 2021, this included \$107 million for certain amounts related to the divestment of the Dodge business, while in 2020 the amount was not significant.

In 2022, “Changes in valuation allowance, net” 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 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 2020, the amount predominantly reflects increases in the valuation allowance resulting from changes in the expectations at that time of future economic conditions due to impacts at that time on the Company’s business from the COVID-19 pandemic.

In 2022, “Effects of changes in tax laws and enacted tax rates” primarily reflect the impact of changes to tax rates in Europe for \$25 million. In 2021, the amount was not significant. In 2020, the amount primarily reflects the impact of changes to tax rates in certain countries in Asia for \$16 million.

In 2022, “Non-deductible / non-taxable items” includes the 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 2020, the negative impact from these items was \$232 million and included \$82 million for the impairment of non-deductible goodwill. The amount in 2020 also includes \$62 million relating to non-operational pension costs resulting from the settlement of certain defined benefit plans which were principally not deductible. 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 2022 and 2021, “Unrecognized tax benefits” in the table above included a net benefit of \$95 million and \$150 million, respectively, related to the interpretation for tax law and double tax treaty agreements by competent tax authorities. The amount in 2020 included a benefit of \$20 million.

In 2020 “Other, net” included an expense of \$54 million, related to the finalization of tax audits in Europe.

Deferred tax assets and liabilities (excluding amounts held for sale and in discontinued operations) consisted of the following:

December 31, (\$ in millions)	2022	2021
Deferred tax assets:		
Unused tax losses and credits	462	551
Provisions and other accrued liabilities	756	757
Other current assets including receivables	100	104
Pension	283	338
Inventories	304	266
Intangible assets	1,154	1,135
Other	66	57
Total gross deferred tax asset	3,125	3,208
Valuation allowance	(1,000)	(1,263)
Total gross deferred tax asset, net of valuation allowance	2,125	1,945
Deferred tax liabilities:		
Property, plant and equipment	(232)	(245)
Intangible assets	(237)	(281)
Other assets	(91)	(107)
Pension	(318)	(302)
Other liabilities	(200)	(175)
Inventories	(44)	(35)
Unremitted earnings of subsidiaries	(336)	(308)
Total gross deferred tax liability	(1,458)	(1,453)
Net deferred tax asset (liability)	667	492
Included in:		
“Deferred taxes”—non-current assets	1,396	1,177
“Deferred taxes”—non-current liabilities	(729)	(685)
Net deferred tax asset (liability)	667	492

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, 2022 and 2021, in the table above, included \$80 million and \$93 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, 2022, 2021 and 2020, was \$1,000 million, \$1,263 million and \$1,518 million, respectively.

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, 2022 and 2021, deferred tax liabilities totaling \$336 million and \$308 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 2022 and 2021, certain taxes arose in certain foreign jurisdictions for which the technical merits do not allow utilization of benefits. At December 31, 2022 and 2021, foreign subsidiary retained earnings which would be subject to withholding taxes upon distribution were approximately \$100 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, 2022, net operating loss carry-forwards of \$1,806 million and tax credits of \$57 million were available to reduce future income taxes of certain subsidiaries. Of these amounts, \$809 million of operating loss carry-forwards and \$47 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, 2020	1,106	233	1,339
Net change due to acquisitions and divestments	1	—	1
Increase relating to prior year tax positions	298	96	394
Decrease relating to prior year tax positions	(161)	(57)	(218)
Increase relating to current year tax positions	390	5	395
Decrease due to settlements with tax authorities	(340)	(75)	(415)
Decrease as a result of the applicable statute of limitations	(59)	(16)	(75)
Exchange rate differences	63	6	69
Balance at December 31, 2020, which would, if recognized, affect the effective tax rate	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

In 2022 and 2021, "Increase relating to current year tax positions" included a total of \$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 2020, “Increase relating to current year tax positions”, included a total of \$381 million in taxes related to the interpretation of tax law and double tax treaty agreements by competent tax authorities. In 2020, \$301 million of the \$381 million is reported as Income tax expense in discontinued operations.

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 2020, “Increase relating to prior year tax positions” is predominantly related to the interpretation of tax law and double tax treaty agreements by competent tax authorities in Europe, of which \$73 million is reported as Income tax expense in discontinued operations.

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 2020, “Decrease relating to prior year tax positions” included a total of \$85 million related to a change of interpretation of tax law in Asia and changed tax risk assessments in Europe of \$59 million.

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

In 2021, “Decrease due to settlements with tax authorities” is predominantly related to tax assessments received in Europe.

In 2020, “Decrease due to settlements with tax authorities” is predominantly related to closed tax audits in Europe.

At December 31, 2022, the Company expected the resolution, within the next twelve months, of unrecognized tax benefits related to pending court cases amounting to \$63 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, 2022, the earliest significant open tax years that remained subject to examination were the following:

Region	Year
Europe	2015
United States	2019
Rest of Americas	2018
China	2013
Rest of Asia, Middle East and Africa	2017

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, 2022, 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 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.

During 2020, the Company took steps to transfer the defined benefit pension risks in three International countries to external financial institutions. Two of these plans were settled entirely for accounting purposes while the third plan involved the settlement of specific obligations for certain former employees. In connection with these transactions, the Company made net payments of \$309 million and recorded non-operational pension charges of \$520 million which were included in net periodic benefit cost as curtailments, settlements and special termination benefits. The Company also made cash payments of \$143 million and recorded non-operational pension charges of \$101 million in 2020 for the settlement of pension obligations in discontinued operations.

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:

(\$ in millions)	Defined pension benefits				Other postretirement benefits	
	Switzerland		International		International	
	2022	2021	2022	2021	2022	2021
Benefit obligation at January 1,	3,434	3,870	5,115	5,527	71	98
Service cost	50	61	38	47	—	1
Interest cost	13	(5)	87	72	1	2
Contributions by plan participants	34	36	10	8	—	—
Benefit payments	(96)	(130)	(234)	(207)	(7)	(9)
Settlements	(92)	(124)	(36)	(84)	—	—
Benefit obligations of businesses acquired (divested)	(328)	—	(2)	(46)	—	(11)
Actuarial (gain) loss	(478)	(140)	(1,075)	(15)	(14)	(8)
Plan amendments and other	—	—	(3)	13	—	(2)
Exchange rate differences	(80)	(134)	(328)	(200)	(1)	—
Benefit obligation at December 31,	2,457	3,434	3,572	5,115	50	71
Fair value of plan assets at January 1,	4,113	4,133	4,463	4,608	—	—
Actual return on plan assets	(310)	279	(789)	197	—	—
Contributions by employer	37	63	58	124	7	9
Contributions by plan participants	34	36	10	8	—	—
Benefit payments	(96)	(130)	(234)	(207)	(7)	(9)
Settlements	(92)	(124)	(36)	(84)	—	—
Plan assets of businesses acquired (divested)	(414)	—	(1)	(50)	—	—
Plan amendments and other	—	—	—	14	—	—
Exchange rate differences	(89)	(144)	(299)	(147)	—	—
Fair value of plan assets at December 31,	3,183	4,113	3,172	4,463	—	—
Funded status — overfunded (underfunded)	726	679	(400)	(652)	(50)	(71)

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

December 31, (\$ in millions)	Defined pension benefits			Other postretirement benefits		
	2022	2021	2020	2022	2021	2020
Net actuarial (loss) gain	(1,183)	(1,540)	(2,038)	32	21	21
Prior service credit	56	72	75	5	7	11
Amount recognized in OCI⁽¹⁾ and NCI⁽²⁾	(1,127)	(1,468)	(1,963)	37	28	32
Taxes associated with amount recognized in OCI and NCI	266	352	374	—	—	—
Amount recognized in OCI and NCI, net of tax⁽³⁾	(861)	(1,116)	(1,589)	37	28	32

(1) OCI represents "Accumulated other comprehensive loss".

(2) NCI represents "Noncontrolling interests".

(3) NCI, net of tax, amounted to \$(1) million, \$0 million and \$(1) million at December 31, 2022, 2021 and 2020.

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

December 31, (\$ in millions)	Defined pension benefits				Other postretirement benefits	
	Switzerland		International		International	
	2022	2021	2022	2021	2022	2021
Overfunded plans	726	683	189	208	—	—
Underfunded plans — current	—	—	(22)	(23)	(6)	(7)
Underfunded plans — non-current	—	(4)	(567)	(837)	(44)	(64)
Funded status - overfunded (underfunded)	726	679	(400)	(652)	(50)	(71)

December 31, (\$ in millions)	2022	2021
Non-current assets		
Overfunded pension plans	915	891
Other employee-related benefits	1	1
Pension and other employee benefits	916	892

December 31, (\$ in millions)	2022	2021
Current liabilities		
Underfunded pension plans	(22)	(23)
Underfunded other postretirement benefit plans	(6)	(10)
Other employee-related benefits	(10)	(8)
Pension and other employee benefits	(38)	(41)

December 31, (\$ in millions)	2022	2021
Non-current liabilities		
Underfunded pension plans	(567)	(841)
Underfunded other postretirement benefit plans	(44)	(62)
Other employee-related benefits	(108)	(122)
Pension and other employee benefits	(719)	(1,025)

The accumulated benefit obligation (ABO) for all defined benefit pension plans was \$5,953 million and \$8,452 million at December 31, 2022 and 2021, 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, (\$ in millions)	PBO exceeds fair value of plan assets				ABO exceeds fair value of plan assets			
	Switzerland		International		Switzerland		International	
	2022	2021	2022	2021	2022	2021	2022	2021
PBO	9	12	2,274	2,994	9	12	2,274	2,979
ABO	9	12	2,222	2,917	9	12	2,222	2,905
Fair value of plan assets	9	8	1,689	2,133	9	8	1,689	2,119

All of the Company's other postretirement benefit plans are unfunded.

Components of net periodic benefit cost

Net periodic benefit cost consisted of the following:

(\$ in millions)	Defined pension benefits						Other postretirement benefits		
	Switzerland			International			International		
	2022	2021	2020	2022	2021	2020	2022	2021	2020
Operational pension cost:									
Service cost	50	61	74	38	47	92	—	1	1
Operational pension cost	50	61	74	38	47	92	—	1	1
Non-operational pension cost (credit):									
Interest cost	13	(5)	6	87	72	111	1	2	3
Expected return on plan assets	(117)	(116)	(123)	(153)	(178)	(253)	—	—	—
Amortization of prior service cost (credit)	(9)	(9)	(11)	(2)	(2)	2	(2)	(3)	(2)
Amortization of net actuarial loss	—	—	7	58	67	109	(3)	(2)	(3)
Curtailments, settlements and special termination benefits	4	1	6	7	7	644	—	—	—
Non-operational pension cost (credit)	(109)	(129)	(115)	(3)	(34)	613	(4)	(3)	(2)
Net periodic benefit cost	(59)	(68)	(41)	35	13	705	(4)	(2)	(1)

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. Net periodic benefit cost includes \$121 million in 2020, related to discontinued operations.

Assumptions

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

December 31, (in %)	Defined pension benefits				Other postretirement benefits	
	Switzerland		International		International	
	2022	2021	2022	2021	2022	2021
Discount rate	2.2	0.2	4.8	2.1	5.3	2.6
Rate of compensation increase	—	—	1.8	1.5	0.3	0.3
Rate of pension increase	—	—	1.8	1.7	—	—
Cash balance interest credit rate	2.0	1.0	2.7	2.1	—	—

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”:

(in %)	Defined pension benefits						Other postretirement benefits		
	Switzerland			International			International		
	2022	2021	2020	2022	2021	2020	2022	2021	2020
Discount rate	0.7	—	0.3	2.1	1.6	1.9	2.0	2.1	2.8
Expected long-term rate of return on plan assets	3.3	3.0	3.0	3.7	4.0	4.3	—	—	—
Rate of compensation increase	—	—	—	1.5	1.0	2.2	0.1	0.2	0.2
Cash balance interest credit rate	1.3	1.0	1.0	2.1	2.1	1.6	—	—	—

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.

The Company maintains other postretirement benefit plans, which are generally contributory with participants’ contributions adjusted annually. The assumptions used were:

December 31,	2022	2021
Health care cost trend rate assumed for next year	5.6%	5.1%
Rate to which the trend rate is assumed to decline (the ultimate trend rate)	4.5%	4.5%
Year that the rate reaches the ultimate trend rate	2029	2026

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:

(in %)	Target	
	Switzerland	International
Asset class		
Equity	15	16
Fixed income	54	72
Real estate	26	4
Other	5	8
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, hedge funds, commodities, and 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, 2022, is 4.5 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, 2022 and 2021, plan assets include ABB Ltd's shares (as well as an insignificant amount of the Company's debt instruments) with a total value of \$7 million and \$8 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, 2022 (\$ in millions)	Level 1	Level 2	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	4,624	1,409	6,355

December 31, 2021 (\$ in millions)	Level 1	Level 2	Not subject to leveling ⁽¹⁾	Total fair value
Asset class				
Equity				
Equity securities	124	1		125
Mutual funds/commingled funds		1,049		1,049
Emerging market mutual funds/commingled funds		218		218
Fixed income				
Government and corporate securities	314	1,366		1,680
Government and corporate—mutual funds/commingled funds		3,121		3,121
Emerging market bonds—mutual funds/commingled funds		428		428
Real estate			1,326	1,326
Insurance contracts		74		74
Cash and short-term investments	75	158		233
Private equity		65	257	322
Total	513	6,480	1,583	8,576

(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 \$114 million and \$125 million at December 31, 2022 and 2021, 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:

(\$ in millions)	Defined pension benefits				Other postretirement benefits	
	Switzerland		International		International	
	2022	2021	2022	2021	2022	2021
Total contributions to defined benefit pension and other postretirement benefit plans	37	63	58	124	7	9
Of which, discretionary contributions to defined benefit pension plans	—	—	18	61	—	—

The total contributions included non-cash contributions totaling \$12 million and \$53 million, respectively, for 2022 and 2021, of available-for-sale debt securities to certain of the Company's pension plans.

The Company expects to contribute approximately \$69 million to its defined benefit pension plans in 2023. Of these contributions, \$4 million are expected to be non-cash contributions. The Company expects to contribute approximately \$6 million to its other postretirement benefit plans in 2023.

The Company also contributes to a number of defined contribution plans. The aggregate expense for these plans in continuing operations was \$269 million, \$278 million and \$205 million in 2022, 2021 and 2020, respectively. Contributions to multi-employer plans were not significant in 2022, 2021 and 2020.

Estimated future benefit payments

The expected future cash flows to be paid by the Company's plans in respect of pension and other postretirement benefit plans at December 31, 2022, are as follows:

(\$ in millions)	Defined pension benefits		Other postretirement benefits
	Switzerland	International	International
2023	212	245	6
2024	211	251	6
2025	195	248	6
2026	195	251	5
2027	186	258	5
Years 2028 - 2032	870	1,254	18

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 \$42 million, \$59 million and \$44 million in 2022, 2021 and 2020, 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 2022, 2021 and 2020 was not significant.

At December 31, 2022, 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, 25 million of the 100 million shares held by the Company as treasury stock at December 31, 2022, 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 WARs to key employees for no consideration. 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 2022, 2021 and 2020 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. Participants may exercise or sell options and exercise WARs after the vesting period, which is three years from the date of grant. All options and WARs expire six years from the date of grant.

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 neutralize the effect of the spin-off on the Company's share price. The amount of the reduction in the strike price was determined to result in an equivalent fair value before and after the spin-off. New equivalent warrants, with the reduced strike prices, were listed by the third-party bank, allowing continued pricing and transferability. For the options held by the third-party bank, to effect the reduction in the exercise price, the Company settled, for cash, the options held by the bank that were outstanding at September 30, 2022, immediately prior to the spin-off, and simultaneously issued an equivalent number of new options for cash to the bank with lower strike prices.

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 2022, 2021 and 2020. In 2022, 69 million options were exercised, representing 14 million shares, with the shares delivered out of treasury stock. Cash received upon exercise amounted to approximately \$330 million. In 2022, 2021 and 2020, the aggregate intrinsic value (on the date of exercise) of options exercised was approximately \$143 million, \$313 million and \$38 million, respectively. In 2022, there were no significant forfeitures, and at December 31, 2022, all options granted under the MIP were vested and exercisable. The aggregate intrinsic value at December 31, 2022, of options outstanding was approximately \$166 million.

Presented below is a summary, by launch, related to options outstanding at December 31, 2022:

Exercise price (in Swiss francs) ⁽¹⁾	Number of options (in millions)	Number of shares (in millions) ⁽²⁾	Weighted-average remaining contractual term (in years)
21.23	6.6	1.3	0.6
22.05	61.5	12.3	1.7
17.63	33.8	6.8	2.7
Total number of options and shares	101.9	20.4	1.9

(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, accreted on a straight-line basis over the three-year vesting period. In Selling, general and administrative expenses, the Company records the changes in both the fair value and vested portion of the outstanding WARs. To hedge its exposure to fluctuations in the fair value of outstanding WARs, the Company 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 (see Note 6), with subsequent changes in fair value recorded in Selling, general and administrative expenses to the extent that they offset the change in fair value of the liability for the WARs. The total impact in Selling, general and administrative expenses in 2022, 2021 and 2020 was not significant.

At December 31, 2022, 8 million WARs were outstanding, all vested and exercisable. In 2022, there were no significant forfeitures. The aggregate fair value of outstanding WARs was \$15 million and \$29 million at December 31, 2022 and 2021, respectively. 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 2022, 2021 and 2020. In 2021, share-based liabilities of \$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 (American Depositary Shares (ADS) in the case of employees in the United States and Canada—each ADS representing one registered share of the Company) 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.

	2022	2021	2020
Expected volatility	25%	20%	24%
Dividend yield	3.0%	2.9%	3.8%
Expected term	1 year	1 year	1 year
Risk-free interest rate	1.1%	-0.6%	-0.7%

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, 2022	1.8	30.32		
Granted	1.8	27.99		
Forfeited	(0.2)	30.28		
Exercised ⁽⁴⁾	(0.1)	29.16		
Not exercised (savings returned plus interest)	(1.5)	29.16		
Outstanding at December 31, 2022	1.8	27.99	0.8	0.1
Vested and expected to vest at December 31, 2022	1.8	27.99	0.8	0.1
Exercisable at December 31, 2022	—	—	—	—

(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 2022 from exercises was not significant. The shares were delivered out of treasury stock.

The exercise prices per ABB Ltd share and per ADS of 27.99 Swiss francs and \$28.09, respectively, for the 2022 grant, 30.32 Swiss francs and \$33.35, respectively, for the 2021 grant, and 22.87 Swiss francs and \$24.93, respectively, for the 2020 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, 2022, 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 2022, 2021 and 2020 was 2.47 Swiss francs, 1.96 Swiss francs and 1.67 Swiss francs, respectively. The total intrinsic value (on the date of exercise) of options exercised in 2021 was approximately \$14 million, while in 2022 and 2020 it 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. Starting with 2020, certain of the employee group previously eligible to receive grants under the MIP have been included in 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 2022 LTIP launch 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 an environmental, social and governance (ESG) component based on the Company's CO₂e emissions reductions (weighted 20 percent). The Performance Shares under the 2021 and 2020 LTIP launches 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 ESG 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 CO₂e emissions reduction over three financial years, beginning with the year of launch, compared to the 2019 baseline emissions. The actual number of shares that will ultimately be delivered will vary depending on the ESG 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 2022, 2021 and 2020 LTIP launches, participants generally do not have the ability to receive any of the award in cash, subject to legal restrictions in certain jurisdictions.

In connection with the spin-off of the Turbocharging Division in October 2022, the number of shares granted to employees under the LTIP launches was adjusted, as per the terms and conditions of the original grant, to neutralize the effect of the spin-off, resulting in an equivalent fair value before and after the spin-off.

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, 2022	1.5	23.23
Granted	0.7	33.33
Turbocharging Division spin-off	0.1	
Vested	(0.3)	23.12
Forfeited	(0.1)	26.96
Nonvested at December 31, 2022	1.9	27.01

The aggregate fair value, at the dates of grant, of Performance Shares granted in 2022 and 2021 was \$26 million and \$37 million, respectively, while in 2020 it was not significant. The total grant-date fair value of shares that vested during 2022, 2021 and 2020 was not significant. The weighted-average grant-date fair value (per share) of shares granted during 2022, 2021 and 2020 was 33.33 Swiss francs, 38.92 Swiss francs and 10.50 Swiss francs, respectively.

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, 2022	2.0	20.61
Granted	0.8	30.52
Turbocharging Division spin-off	0.1	
Vested	(0.1)	19.60
Forfeited	(0.2)	23.72
Nonvested at December 31, 2022	2.6	23.65

The aggregate fair value, at the dates of grant, of Restricted Shares granted in 2022, 2021 and 2020 was \$27 million, \$26 million and \$22 million, respectively. The total grant-date fair value of shares that vested during 2022, 2021 and 2020 was not significant. The weighted-average grant-date fair value (per share) of shares granted during 2022 and 2021 was 30.52 Swiss francs, 26.39 Swiss francs and 15.76 Swiss francs, respectively.

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, 2022, total unrecognized compensation cost related to equity-settled awards under the LTIP was \$50 million and is expected to be recognized over a weighted-average period of 1.8 years. The compensation cost recorded in 2022, 2021 and 2020 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 ESG component of the LTIP launch, 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 ESG component achievement, as determined by internal modelling based on the Company's CO₂e 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 2022, 2021 and 2020 was not significant.

Note 19

Stockholders' equity

Capital

At December 31, 2022, the Company had 2,469 million authorized shares, of which 1,965 million were registered and issued. At December 31, 2021, the Company had 2,557 million authorized shares, of which 2,053 million were registered and issued.

Dividends

At the Annual General Meeting of Shareholders (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. At the AGM in March 2020, 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 \$1,758 million and was paid in April 2020.

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, 2022, the total unconsolidated stockholders' equity of ABB Ltd was 6,219 million Swiss francs (\$6,742 million), including 236 million Swiss francs (\$256 million) representing share capital, 8,852 million Swiss francs (\$9,597 million) representing reserves and 2,869 million Swiss francs (\$3,111 million) representing a reduction of equity for treasury shares. Of the reserves, 2,869 million Swiss francs (\$3,111 million) relating to treasury shares and 47 million Swiss francs (\$51 million) representing 20 percent of share capital, at December 31, 2022, 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 launched in July 2020 and April 2021. 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 new share buyback program of up to \$3 billion. This program, which was launched in April 2022, is being executed on a second trading line on the SIX Swiss Exchange and is planned to run until the Company's 2023 AGM.

Under these buyback programs, in 2022, 2021 and 2020, the Company purchased 91 million, 78 million and 109 million, respectively, of its own shares, resulting in an increase in Treasury stock of \$2,842 million, \$2,651 million and \$2,835 million, respectively.

In addition to the share buyback programs, in 2022, 2021 and 2020, the Company purchased a combined total of 20 million, 33 million and 13 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 \$660 million, \$1,032 million and \$346 million, respectively.

Obligations to issue shares relating to employee incentive programs

At December 31, 2022, the Company had outstanding obligations to deliver:

- up to 1 million shares relating to the options granted under the 2017 launch of the MIP, with a strike price of 21.23 Swiss francs, vested in August 2020 and expiring in August 2023,
- 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 7 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 2023,
- up to 8 million shares to Eligible Participants under the 2022, 2021 and 2020 launches of the LTIP, vesting and expiring in April 2025, April 2024 and April 2023, 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. In connection with the spin-off of the Turbocharging Division in October 2022, the Company settled, for cash, the options outstanding at September 30, 2022, immediately prior to the spin-off, and simultaneously issued to the bank for cash an equivalent number of new options with lower strike prices. The strike price of these new options was determined so as to neutralize the effect of the spin-off on the Company's share price. At December 31, 2022, such call options representing 3.3 million shares and with strike prices ranging from 17.63 to 22.05 Swiss francs (weighted-average strike price of 20.58 Swiss francs) were held by the bank. The call options expire in periods ranging from August 2023 to August 2025.

See Note 18 for a description of the above share-based payment arrangements.

In 2022, 2021 and 2020, the Company delivered 16 million, 36 million and 17 million shares, respectively, out of treasury stock, for options exercised in relation to the MIP. In addition, in 2021 and 2020, the Company delivered 1.7 million and 1.4 million shares, respectively, out of treasury stock under 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.

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 and 2020, outstanding securities representing a maximum of 2 million and 79 million shares, respectively, were excluded from the calculation of diluted earnings per share as their inclusion would have been antidilutive. None were excluded in 2021.

Basic earnings per share:

(\$ in millions, except per share data in \$)	2022	2021	2020
Amounts attributable to ABB shareholders:			
Income from continuing operations, net of tax	2,517	4,625	294
Income (loss) from discontinued operations, net of tax	(42)	(79)	4,852
Net income	2,475	4,546	5,146
Weighted-average number of shares outstanding (in millions)	1,899	2,001	2,111
Basic earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	1.33	2.31	0.14
Income (loss) from discontinued operations, net of tax	(0.02)	(0.04)	2.30
Net income	1.30	2.27	2.44

Diluted earnings per share:

(\$ in millions, except per share data in \$)	2022	2021	2020
Amounts attributable to ABB shareholders:			
Income from continuing operations, net of tax	2,517	4,625	294
Income (loss) from discontinued operations, net of tax	(42)	(79)	4,852
Net income	2,475	4,546	5,146
Weighted-average number of shares outstanding (in millions)	1,899	2,001	2,111
Effect of dilutive securities:			
Call options and shares	11	18	8
Adjusted weighted-average number of shares outstanding (in millions)	1,910	2,019	2,119
Diluted earnings per share attributable to ABB shareholders:			
Income from continuing operations, net of tax	1.32	2.29	0.14
Income (loss) from discontinued operations, net of tax	(0.02)	(0.04)	2.29
Net income	1.30	2.25	2.43

Note 21

Other comprehensive income

The following table includes amounts recorded within “Total other comprehensive income (loss)” including the related income tax effects:

(\$ in millions)	2022			2021			2020		
	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	(685)	—	(685)	(521)	—	(521)	500	(2)	498
Net loss on complete or substantially complete liquidations of foreign subsidiaries	5	—	5	—	—	—	—	—	—
Changes attributable to divestments	41	—	41	(9)	—	(9)	519	—	519
Net change during the year	(639)	—	(639)	(530)	—	(530)	1,019	(2)	1,017
Available-for-sale securities:									
Net unrealized gains (losses) arising during the year	(28)	5	(23)	(13)	3	(10)	31	(7)	24
Reclassification adjustments for net (gains) losses included in net income	2	—	2	(6)	1	(5)	(18)	4	(14)
Changes attributable to divestments	—	—	—	—	—	—	(3)	—	(3)
Net change during the year	(26)	5	(21)	(19)	4	(15)	10	(3)	7
Pension and other postretirement plans:									
Prior service (costs) credits arising during the year	(2)	2	—	2	(2)	—	55	(12)	43
Net actuarial gains (losses) arising during the year	298	(72)	226	437	(26)	411	(243)	43	(200)
Amortization of prior service cost (credit) included in net income	(13)	(3)	(16)	(14)	—	(14)	(11)	—	(11)
Amortization of net actuarial loss included in net income	55	(11)	44	65	4	69	113	(25)	88
Net losses from settlements and curtailments included in net income	11	(2)	9	7	—	7	650	(132)	518
Changes attributable to divestments	(8)	—	(8)	(8)	2	(6)	186	(35)	151
Net change during the year	341	(86)	255	489	(22)	467	750	(161)	589
Derivative instruments and hedges:									
Net gains (losses) arising during the year	(10)	(2)	(12)	7	1	8	2	—	2
Reclassification adjustments for net (gains) losses included in net income	12	—	12	(13)	—	(13)	(2)	2	—
Net change during the year	2	(2)	—	(6)	1	(5)	—	2	2
Total other comprehensive income (loss)	(322)	(83)	(405)	(66)	(17)	(83)	1,779	(164)	1,615

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, 2020	(3,450)	10	(2,145)	(5)	(5,590)
Other comprehensive (loss) income before reclassifications	498	24	(157)	2	367
Amounts reclassified from OCI	519	(17)	746	—	1,248
Total other comprehensive (loss) income	1,017	7	589	2	1,615
Less:					
Amounts attributable to noncontrolling interests	27	—	—	—	27
Balance at December 31, 2020	(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 and redeemable noncontrolling interests	(34)	—	(1)	—	(35)
Balance at December 31, 2022	(3,691)	(19)	(838)	(8)	(4,556)

(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)	Location of (gains) losses	2022	2021	2020
Details about OCI components	reclassified from OCI			
Foreign currency translation adjustments:				
Net loss on complete or substantially complete liquidations of foreign subsidiaries	Other income (expense), net	5	—	—
Changes attributable to divestments:				
- Loss on solar inverters business (see Note 4)	Other income (expense), net	—	—	99
- Losses (gains) on other divestments, net	Other income (expense), net	41	(9)	—
- Loss on Power Grids business (see Note 3)	Income (loss) from discontinued operations, net of tax	—	—	420
Amounts reclassified from OCI		46	(9)	519
Pension and other postretirement plan adjustments:				
Amortization of prior service cost (credit)	Non-operational pension (cost) credit ⁽¹⁾	(13)	(14)	(11)
Amortization of net actuarial loss	Non-operational pension (cost) credit ⁽¹⁾	55	65	113
Net losses from settlements and curtailments	Non-operational pension (cost) credit ⁽¹⁾	11	7	650
Changes attributable to divestments:				
- Losses (gains) on divestments, net	Other income (expense), net	(8)	(8)	—
- Loss on Power Grids business (see Note 3)	Income (loss) from discontinued operations, net of tax ⁽²⁾	—	—	186
Total before tax		45	50	938
Tax	Income tax expense	(16)	4	(157)
Changes in tax attributable to divestments:				
- Losses (gains) on divestments, net	Other income (expense), net	—	2	—
- Loss on Power Grids business (see Note 3)	Income (loss) from discontinued operations, net of tax ⁽²⁾	—	—	(35)
Amounts reclassified from OCI		29	56	746

(1) Amounts in 2020, include a total of \$94 million, reclassified from OCI to Income (loss) from discontinued operations (see Note 3).

(2) Amounts represent the reclassification of OCI relating to pensions, including tax, on divestment of the Power Grids business.

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 2022, 2021 and 2020.

Note 22

Restructuring and related expenses

OS program

From December 2018 to December 2020, the Company executed a two-year restructuring program with the objective of simplifying its business model and structure through the implementation of a new organizational structure driven by its businesses. The program resulted in the elimination of the country and regional structures within the previous matrix organization, including the elimination of the three regional Executive Committee roles. The operating businesses are now responsible for both their customer-facing activities and business support functions, while the remaining Group-level corporate activities primarily focus on Group strategy, portfolio and performance management and capital allocation.

As of December 31, 2020, the Company has incurred substantially all costs related to the OS program.

Liabilities associated with the OS program are included primarily in Other provisions. The following table shows the activity from the beginning of the program to December 31, 2022:

(\$ in millions)	Employee severance costs	Contract settlement, loss order and other costs	Total
Liability at January 1, 2018	—	—	—
Expenses	65	—	65
Liability at December 31, 2018	65	—	65
Expenses	111	1	112
Cash payments	(44)	(1)	(45)
Change in estimates	(30)	—	(30)
Exchange rate differences	(3)	—	(3)
Liability at December 31, 2019	99	—	99
Expenses	119	17	136
Cash payments	(91)	(15)	(106)
Change in estimates	(10)	—	(10)
Exchange rate differences	4	—	4
Liability at December 31, 2020	121	2	123
Expenses, net of change in estimates	2	2	4
Cash payments	(65)	(3)	(68)
Exchange rate differences	(6)	—	(6)
Liability at December 31, 2021	52	1	53
Expenses, net of change in estimates	(7)	1	(6)
Cash payments	(22)	(1)	(23)
Exchange rate differences	(3)	—	(3)
Liability at December 31, 2022	20	1	21

The following table outlines the costs incurred in 2020 and the cumulative costs incurred under the program per operating segment as well as Corporate and Other:

(\$ in millions)	Costs incurred in 2020	Cumulative costs incurred up to December 31, 2020
Electrification	35	85
Motion	18	25
Process Automation	37	61
Robotics & Discrete Automation	10	18
Corporate and Other	49	114
Total	149	303

The Company recorded the following expenses, net of change in estimates, under this program:

(\$ in millions)	Costs incurred in	Cumulative costs
	2020	incurred up to December 31, 2020
Employee severance costs	109	255
Estimated contract settlement, loss order and other costs	17	18
Inventory and long-lived asset impairments	23	30
Total	149	303

Restructuring expenses recorded for this program are included in the following line items in the Consolidated Income Statements:

(\$ in millions)	2020
Total cost of sales	38
Selling, general and administrative expenses	37
Non-order related research and development expenses	4
Other income (expense), net	70
Total	149

Other restructuring-related activities

In addition, during 2022, 2021 and 2020, the Company executed various other restructuring-related activities and incurred the following charges, net of changes in estimates:

(\$ in millions)	2022	2021	2020
Employee severance costs	81	101	164
Estimated contract settlement, loss order and other costs	209	31	18
Inventory and long-lived asset impairments	7	24	12
Total	297	156	194

Expenses associated with these activities are recorded in the following line items in the Consolidated Income Statements:

(\$ in millions)	2022	2021	2020
Total cost of sales	24	71	95
Selling, general and administrative expenses	40	21	50
Non-order related research and development expenses	2	2	10
Other income (expense), net	231	62	39
Total	297	156	194

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, 2022 and 2021, \$198 million and \$212 million, respectively, was recorded for other 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.

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 electric vehicle charging infrastructure, renewable power solutions, modular substation packages, distribution automation products, switchboard 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 seven operating Divisions: Distribution Solutions, Smart Power, Smart Buildings, E-mobility, Installation Products, Power Conversion and Service.
- **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 130 years of cumulative experience in electric powertrains, the Business Area combines domain expertise and technology to deliver the optimum solution for a wide range of applications in all industrial segments. In addition, the Business Area, 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:** develops and sells a broad range of industry-specific, integrated automation, electrification and digital systems and solutions, as well as digital solutions, lifecycle services, advanced industrial analytics and artificial intelligence applications and suites for the process, marine and hybrid industries. Products and solutions include control technologies, advanced process control software and manufacturing execution systems, sensing, measurement and analytical instrumentation, marine propulsion systems and turbochargers. In addition, the Business Area offers a comprehensive range of services ranging from repair to advanced services such as remote monitoring, preventive maintenance, asset performance management, emission monitoring and cybersecurity services. The products, systems and services are delivered through five 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 (Accelleron).
- **Robotics & Discrete Automation:** delivers its products, solutions and services through two operating Divisions: Robotics and Machine Automation. Robotics includes industrial robots, autonomous mobile robotics, software, robotic solutions, field services, spare parts, and digital services. Machine Automation specializes in solutions based on its programmable logic controllers (PLC), industrial PCs (IPC), servo motion, transport systems and machine vision. Both Divisions offer engineering and simulation software as well as a comprehensive range of digital solutions.

Corporate and Other: includes headquarter costs, the Company's corporate real estate activities, Corporate Treasury Operations, historical operating activities of certain divested businesses and other non-core operating activities.

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),
- changes in estimates relating to opening balance sheets of acquired businesses (changes in pre-acquisition estimates),
- 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,
- other income/expense relating to the Power Grids joint venture,
- 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 (including impairment of goodwill) and certain other fair value changes, 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 2022, 2021 and 2020:

2022						
(\$ in millions)	Electrification	Motion	Process Automation	Robotics & Discrete Automation	Corporate and Other	Total
Geographical markets						
Europe	4,449	2,031	2,248	1,494	63	10,285
The Americas	5,332	2,148	1,566	524	3	9,573
of which: United States	3,918	1,787	943	373	2	7,023
Asia, Middle East and Africa	4,123	2,101	2,199	1,155	10	9,588
of which: China	1,984	1,147	666	897	2	4,696
	13,904	6,280	6,013	3,173	76	29,446
Product type						
Products	12,179	5,380	1,337	1,863	7	20,766
Systems	830	—	1,974	832	69	3,705
Services and software	895	900	2,702	478	—	4,975
	13,904	6,280	6,013	3,173	76	29,446
Third-party revenues	13,904	6,280	6,013	3,173	76	29,446
Intersegment revenues	201	465	31	8	(705)	—
Total revenues	14,105	6,745	6,044	3,181	(629)	29,446

2021						
(\$ in millions)	Electrification	Motion	Process Automation	Robotics & Discrete Automation	Corporate and Other	Total
Geographical markets						
Europe	4,517	2,015	2,416	1,578	3	10,529
The Americas	4,465	2,346	1,431	439	5	8,686
of which: United States	3,304	1,952	833	308	—	6,397
Asia, Middle East and Africa	3,975	2,111	2,367	1,270	7	9,730
of which: China	2,087	1,156	740	949	—	4,932
	12,957	6,472	6,214	3,287	15	28,945
Product type						
Products	10,706	5,555	1,496	2,159	4	19,920
Systems	1,367	—	1,802	645	11	3,825
Services and software	884	917	2,916	483	—	5,200
	12,957	6,472	6,214	3,287	15	28,945
Third-party revenues	12,957	6,472	6,214	3,287	15	28,945
Intersegment revenues	230	453	45	10	(738)	—
Total revenues	13,187	6,925	6,259	3,297	(723)	28,945

	2020					
(\$ in millions)	Electrification	Motion	Process Automation	Robotics & Discrete Automation	Corporate and Other	Total
Geographical markets						
Europe	4,008	1,934	2,322	1,429	15	9,708
The Americas	4,050	2,173	1,321	385	7	7,936
of which: United States	3,093	1,846	805	270	5	6,019
Asia, Middle East and Africa	3,506	1,807	2,038	1,024	7	8,382
of which: China	1,820	926	628	714	3	4,091
	11,564	5,914	5,681	2,838	29	26,026
Product type						
Products	9,951	5,040	1,263	1,635	53	17,942
Systems	743	—	1,665	780	(24)	3,164
Services and software	870	874	2,753	423	—	4,920
	11,564	5,914	5,681	2,838	29	26,026
Third-party revenues	11,564	5,914	5,681	2,838	29	26,026
Intersegment revenues ⁽¹⁾	360	495	111	69	(927)	108
Total revenues	11,924	6,409	5,792	2,907	(898)	26,134

(1) Intersegment revenues until June 30, 2020, include sales to the Power Grids business, which is presented as discontinued operations, and are not eliminated from Total revenues (see Note 3).

Revenues by geography reflect the location of the customer. In 2022, 2021 and 2020 the United States and China are the only countries where revenue exceeded 10 percent of Total revenues. In each of 2022, 2021 and 2020 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 expenditure for 2022, 2021 and 2020, as well as Total assets at December 31, 2022, 2021 and 2020:

(\$ in millions)	2022	2021	2020
Operational EBITA:			
Electrification	2,328	2,121	1,681
Motion	1,163	1,183	1,075
Process Automation	848	801	451
Robotics & Discrete Automation	340	355	237
Corporate and Other:			
— Non-core and divested businesses	5	(39)	(133)
— Stranded corporate costs	—	—	(40)
— Corporate costs and Other intersegment elimination	(174)	(299)	(372)
Total	4,510	4,122	2,899
Acquisition-related amortization	(229)	(250)	(263)
Restructuring, related and implementation costs ⁽¹⁾	(347)	(160)	(410)
Changes in obligations related to divested businesses	88	(9)	(218)
Changes in pre-acquisition estimates	(10)	6	(11)
Gains and losses from sale of businesses	(7)	2,193	(2)
Fair value adjustment on assets and liabilities held for sale	—	—	(33)
Acquisition- and divestment-related expenses and integration costs	(195)	(132)	(74)
Other income/expenses relating to the Power Grids joint venture	(57)	(34)	(20)
Foreign exchange/commodity timing differences in income from operations:			
Unrealized gains and losses on derivatives (foreign exchange, commodities, embedded derivatives)	32	(54)	67
Realized gains and losses on derivatives where the underlying hedged transaction has not yet been realized	(48)	(2)	26
Unrealized foreign exchange movements on receivables/payables (and related assets/liabilities)	(15)	20	(33)
Certain other non-operational items:			
Costs for divestment of Power Grids	—	—	(86)
Regulatory, compliance and legal costs	(317)	—	(7)
Business transformation costs ⁽²⁾	(152)	(92)	(37)
Favorable resolution of an uncertain purchase price adjustment	15	6	36
Gains and losses from sale of investments in equity-accounted companies	43	—	—
Certain other fair value changes, including asset impairments ⁽³⁾	45	119	(239)
Other non-operational items	(19)	(15)	(2)
Income from operations	3,337	5,718	1,593
Interest and dividend income	72	51	51
Interest and other finance expense	(130)	(148)	(240)
Losses from extinguishment of debt	—	—	(162)
Non-operational pension (cost) credit	115	166	(401)
Income from continuing operations before taxes	3,394	5,787	841

(1) Amount in 2022 includes impairment of certain assets. Amount in 2020 includes \$67 million of implementation costs in relation to the OS program.

(2) Amounts in 2022 and 2021 include ABB Way process transformation costs of \$131 million and \$80 million, respectively.

(3) Amount in 2020 includes goodwill impairment charges of \$311 million.

(\$ in millions)	Depreciation and amortization			Capital expenditures ⁽¹⁾			Total assets ^{(1), (2)} at December 31,		
	2022	2021	2020	2022	2021	2020	2022	2021	2020
Electrification	406	425	411	385	345	316	13,992	12,831	12,800
Motion	141	172	182	150	230	118	6,565	5,936	6,495
Process Automation	75	83	80	100	85	75	4,598	5,009	5,008
Robotics & Discrete Automation	141	144	131	86	96	65	4,901	4,860	4,794
Corporate and Other	51	69	111	41	64	120	9,092	11,624	11,991
Consolidated	814	893	915	762	820	694	39,148	40,260	41,088

(1) Capital expenditures and Total assets are after intersegment eliminations and therefore reflect third-party activities only.

(2) At December 31, 2022, 2021 and 2020, Corporate and Other includes \$96 million, \$136 million and \$282 million, respectively, of assets in the Power Grids business which is reported as discontinued operations (see Note 3). In addition, at December 31, 2021 and 2020, Corporate and Other included \$1,609 million and \$1,710 million, respectively, 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:

(\$ in millions)	Long-lived assets at December 31,	
	2022	2021
Europe	2,533	2,670
The Americas	1,256	1,260
Asia, Middle East and Africa	963	1,009
Total	4,752	4,939

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, 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. At December 31, 2021, approximately 19 percent, 12 percent and 11 percent of the Company's long-lived assets were located in the United States, China and Switzerland, respectively.

2023 Realignment of segments

Commencing in January 2023, the E-mobility Division is no longer managed within the Electrification Business Area and has become an independent Division and a separate operating segment. The Division does not currently meet any of the size thresholds to be considered a reportable segment and will be presented within Corporate and Other.

Note 24

Subsequent events

Divestments

On January 19, 2023, the Company reached an agreement to sell its Power Conversion Division to AcBel Polytech Inc. for \$505 million in cash. The transaction is subject to regulatory approvals and is expected to be completed in the second half of 2023.

Debt

On January 16, 2023, the Company issued the following EUR Instruments: (i) EUR 500 million of 3.25% Instruments, due 2027, and (ii) EUR 750 million of 3.375% Instruments, due 2031, both paying interest annually in arrears at a fixed rate. 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).

As of February 23, 2023, the Company has repaid all amounts previously outstanding at December 31, 2022, under the \$2 billion Euro commercial paper program.

Income taxes

In February 2023, on completion of a tax audit, the Company obtained resolution of an uncertain tax position for which an amount was recorded within Other non-current liabilities as of December 31, 2022. Due to the resolution of this matter, the Company expects to release the provision of approximately \$200 million in the first quarter of 2023.

Stockholders' equity

In February 2023, the Company announced that a proposal will be put to the 2023 AGM for approval by the shareholders to distribute 0.84 Swiss francs per share to shareholders.

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.