

**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, 2017**
- OR
- TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
- OR
- SHELL COMPANY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

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	Name of each exchange on which registered
American Depositary Shares, each representing one Registered Share	New York Stock Exchange
Registered Shares, par value CHF 0.12	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:
2,138,606,489 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 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

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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post 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. (Check one):

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.

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.

TABLE OF CONTENTS

	<u>Page</u>
PART I	3
Item 1. Identity of Directors, Senior Management and Advisers	3
Item 2. Offer Statistics and Expected Timetable	3
Item 3. Key Information	4
Item 4. Information on the Company	15
Item 4A. Unresolved Staff Comments	31
Item 5. Operating and Financial Review and Prospects	31
Item 6. Directors, Senior Management and Employees	75
Item 7. Major Shareholders and Related Party Transactions	112
Item 8. Financial Information	112
Item 9. The Offer and Listing	113
Item 10. Additional Information	114
Item 11. Quantitative and Qualitative Disclosures About Market Risk	124
Item 12. Description of Securities Other than Equity Securities	126
PART II	126
Item 13. Defaults, Dividend Arrearages and Delinquencies	126
Item 14. Material Modifications to the Rights of Security Holders and Use of Proceeds	126
Item 15. Controls and Procedures	127
Item 15T. Controls and Procedures	128
Item 16A. Audit Committee Financial Expert	128
Item 16B. Code of Ethics	128
Item 16C. Principal Accountant Fees and Services	129
Item 16D. Exemptions from the Listing Standards for Audit Committees	129
Item 16E. Purchase of Equity Securities by Issuer and Affiliated Purchasers	130
Item 16F. Change in Registrant's Certifying Accountant	130
Item 16G. Corporate Governance	130
Item 16H. Mine Safety Disclosure	130
PART III	130
Item 17. Financial Statements	130
Item 18. Financial Statements	130
Item 19. Exhibits	131

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,” “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.

FINANCIAL AND OTHER INFORMATION

The Consolidated Financial Statements of ABB Ltd, including the notes thereto, as of December 31, 2017 and 2016, and for each of the years in the three-year period ended December 31, 2017 (our Consolidated Financial Statements) have been prepared in accordance with United States generally accepted accounting principles (U.S. GAAP). ABB Ltd has separately prepared its statutory unconsolidated financial statements in accordance with the Swiss Code of Obligations.

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” refers to the lawful currency of the People’s Republic of China; (vi) “AED” refers to the lawful currency of the United Arab Emirates; (vii) “AUD” and “Australian dollar” refer to the lawful currency of Australia; and (viii) “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. These translations have been made using 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 as of December 29, 2017, unless otherwise indicated. The twelve o’clock buying rate for Swiss francs on December 29, 2017, was \$1.00 = CHF 0.9738. The twelve o’clock buying rate for Swiss francs on February 16, 2018, was \$1.00 = CHF 0.9258.

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, 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 (including in connection with our share buyback program), acquisitions and integration, including the contemplated acquisition of General Electric Company’s Industrial Solutions business and the anticipated timing of the closing of such acquisition, 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, including the Energy and Fourth Industrial Revolutions and 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, Next Level Strategy, and cost-saving measures, as well as, the following:

- statements in “Item 3. Key Information—Dividends and Dividend Policy” regarding our policy on future dividend payments,
- statements in “Item 3. Key Information—Risk Factors,”
- statements in “Item 4. Information on the Company” regarding the timing of intended capital expenditures,
- statements in “Item 5. Operating and Financial Review and Prospects” regarding our management objectives, including our mid-term outlook, as well as trends in results, prices, volumes, operations, margins and overall market trends, and
- statements in “Item 8. Financial Information—Legal Proceedings” regarding the outcome of certain legal and compliance matters.

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:

- Our business is exposed to risks associated with the volatile global economic environment and political conditions.
- 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.
- Our operations in emerging markets expose us to risks associated with conditions in those markets.
- Undertaking long term, technologically complex projects or projects that are dependent upon factors not wholly within our control could adversely affect our profitability and future prospects.
- We operate in very competitive markets and could be adversely affected if we fail to keep pace with technological changes.
- Our multi national operations expose us to the risk of fluctuations in currency exchange rates.
- Our hedging activities may not protect us against the consequences of significant fluctuations in exchange rates, interest rates or commodity prices on our earnings and cash flows.
- Increases in costs or limitation of supplies of raw materials may adversely affect our financial performance.
- An inability to protect our intellectual property rights could adversely affect our business.
- Industry consolidation could result in more powerful competitors and fewer customers.
- 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 may be the subject of product liability claims.

- The United Kingdom’s decision to withdraw from the European Union may have a negative effect on global economic conditions, financial markets and our business.
- We may encounter difficulty in managing our business due to the global nature of our operations.
- 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.
- Examinations by tax authorities and changes in tax regulations could result in lower earnings and cash flows.
- The recent comprehensive tax reform in the United States could adversely affect our financial condition and results of operations.
- If we are unable to attract and retain qualified management and personnel then our business may be adversely affected.
- Anticipated benefits of existing and potential future mergers, acquisitions, joint ventures or strategic alliances may not be realized.
- Increased information technology (IT) security threats and more sophisticated cyber attacks could pose a risk to our systems, networks, products, solutions and services.
- If a material weakness were identified in our internal control over financial reporting, that could result in material inaccuracies in our consolidated financial statements and adversely affect our business and results of operations.
- There is no guarantee that our ongoing efforts to reduce costs will be successful.
- Our business strategy may include making strategic divestitures. There can be no assurance that any divestitures will provide business benefit.
- We could be affected by future laws or regulations enacted to address climate change concerns as well as the physical effects of climate change.
- The acquisition of General Electric Company’s Industrial Solutions division may not close in the timeframe we expect, or at all.

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

SELECTED FINANCIAL DATA

The following table presents our selected financial and operating information at the dates and for each of the periods indicated. 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 our profitability, the comparability of our results between periods, as well as the reported carrying value of our assets and liabilities. You should read the following information together with the information contained in “Item 5. Operating and Financial Review and Prospects,” as well as our Consolidated Financial Statements and the Notes thereto, included elsewhere in this Annual Report.

Our selected financial data are presented in the following tables in accordance with U.S. GAAP and have been derived from our published Consolidated Financial Statements. Our Consolidated Financial Statements as of and for each of the years ended December 31, 2017, 2016, 2015, 2014 and 2013, were audited by Ernst & Young AG.

INCOME STATEMENT DATA:

(\$ in millions, except per share data in \$)	2017	2016	2015	2014	2013
Total revenues	34,312	33,828	35,481	39,830	41,848
Total cost of sales	(24,046)	(24,081)	(25,347)	(28,615)	(29,856)
Gross profit	10,266	9,747	10,134	11,215	11,992
Selling, general and administrative expenses	(5,607)	(5,349)	(5,574)	(6,067)	(6,094)
Non-order related research and development expenses	(1,365)	(1,300)	(1,406)	(1,499)	(1,470)
Other income (expense), net	140	(111)	(105)	529	(41)
Income from operations	3,434	2,987	3,049	4,178	4,387
Interest and dividend income	74	73	77	80	69
Interest and other finance expense	(277)	(261)	(286)	(362)	(390)
Income from continuing operations before taxes	3,231	2,799	2,840	3,896	4,066
Provision for taxes	(860)	(781)	(788)	(1,202)	(1,122)
Income from continuing operations, net of tax	2,371	2,018	2,052	2,694	2,944
Income (loss) from discontinued operations, net of tax	(6)	16	3	24	(37)
Net income	2,365	2,034	2,055	2,718	2,907
Net income attributable to noncontrolling interests	(152)	(135)	(122)	(124)	(120)
Net income attributable to ABB	2,213	1,899	1,933	2,594	2,787
<i>Amounts attributable to ABB shareholders:</i>					
Income from continuing operations, net of tax	2,219	1,883	1,930	2,570	2,824
Net income	2,213	1,899	1,933	2,594	2,787
<i>Basic earnings per share attributable to ABB shareholders:</i>					
Income from continuing operations, net of tax	1.04	0.88	0.87	1.12	1.23
Net income	1.04	0.88	0.87	1.13	1.21
<i>Diluted earnings per share attributable to ABB shareholders:</i>					
Income from continuing operations, net of tax	1.03	0.87	0.87	1.12	1.23
Net income	1.03	0.88	0.87	1.13	1.21
<i>Weighted-average number of shares outstanding (in millions) used to compute:</i>					
Basic earnings per share attributable to ABB shareholders	2,138	2,151	2,226	2,288	2,297
Diluted earnings per share attributable to ABB shareholders	2,148	2,154	2,230	2,295	2,305

BALANCE SHEET DATA:

(\$ in millions)	December 31,				
	2017	2016	2015	2014	2013
Cash and equivalents	4,526	3,644	4,565	5,443	6,021
Marketable securities and short-term investments	1,102	1,953	1,633	1,325	464
Total assets ⁽¹⁾	43,262	39,202	41,072	44,540	47,826
Long-term debt (excluding current maturities of long-term debt)	6,709	5,800	5,985	7,312	7,538
Total debt ⁽²⁾	7,447	6,803	7,439	7,665	7,991
Capital stock and additional paid-in capital	217	216	1,444	1,777	1,750
Total stockholders' equity (including noncontrolling interests)	15,349	13,897	14,988	16,815	19,208

CASH FLOW DATA:

(\$ in millions)	2017	2016	2015	2014	2013
Net cash provided by operating activities	3,799	3,843	3,818	3,845	3,653
Net cash used in investing activities	(1,450)	(1,305)	(974)	(1,121)	(717)
Net cash used in financing activities	(1,735)	(3,355)	(3,380)	(3,024)	(3,856)

- (1) As of January 1, 2017, we adopted an accounting standard update removing the requirement to separate deferred tax liabilities and assets into current and noncurrent amounts and instead requiring all such amounts, as well as any related valuation allowance, to be classified as noncurrent in the consolidated balance sheets. As a result, total assets at December 31, 2016, 2015, 2014 and 2013, have been restated.
- (2) Total debt is equal to the sum of short-term debt (including current maturities of long-term debt) and long-term debt.

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 steadily rising, sustainable annual dividend over time.

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. As a holding company, ABB Ltd's main sources of income are dividend and interest payments from its subsidiaries.

At December 31, 2017, the total unconsolidated stockholders' equity of ABB Ltd was CHF 8,654 million, including CHF 260 million representing share capital, CHF 9,029 million representing reserves and CHF 635 million representing a reduction of equity for own shares (treasury stock). Of the reserves, CHF 635 million relating to own shares and CHF 52 million representing 20 percent of share capital, are restricted and not available for distribution.

With respect to the years ended December 31, 2013, ABB Ltd paid a dividend of CHF 0.70 (USD 0.79) per share. With respect to the year ended December 31, 2014, ABB Ltd distributed a total of CHF 0.72 per share to shareholders, which comprised a dividend of CHF 0.55 (USD 0.59) paid out of ABB Ltd's capital contribution reserves and a distribution of CHF 0.17 (USD 0.18) by way of a nominal value reduction (a reduction of CHF 0.17 in the par value of each share from CHF 1.03 to CHF 0.86). With respect to the year ended December 31, 2015, ABB Ltd distributed a total of CHF 0.74 (USD 0.75) per share to shareholders by way of a nominal value reduction (a reduction of CHF 0.74 in the par value of each share from CHF 0.86 to CHF 0.12). With respect to the year ended December 31, 2016, ABB Ltd paid a dividend of CHF 0.76 (USD 0.76) per share. The USD amounts for each of the foregoing dividend payments made in CHF have been translated using the average rates of the month in which the dividends were paid.

With respect to the year ended December 31, 2017, ABB Ltd's Board of Directors has proposed to pay a dividend of CHF 0.78 per share to shareholders. The distribution is subject to approval by shareholders at ABB Ltd's 2018 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".

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 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 “Forward-Looking Statements”.

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

Adverse changes in economic or political conditions as well as concerns about global trade, global health pandemics, developments in energy prices, 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, which may force them to modify, delay or cancel 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 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 power and automation divisions are affected by the level of investments 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, increases in pension and postretirement benefit expenses, 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 or economic sanctions or other restrictions imposed on these countries, and that 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 2017, our total revenues from business with countries identified by the U.S. government as state sponsors of terrorism represented a very small percentage of our total revenues. Based on the amount of revenues and other relevant quantitative and qualitative factors, we have determined that our business in 2017 with countries identified by the U.S. government as state sponsors of terrorism was not material.

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 and other applicable laws or regulations. 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.

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 2017, approximately 46 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
- the introduction of 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.

Undertaking long-term, technologically 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 technologically 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 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 design and technical 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,
- project modifications that create unanticipated costs,
- delays caused by customers, force majeure or local weather and geological conditions, including 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,
- issues pertaining to licensing and intellectual property rights,
- 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 agreed-upon schedule and contractual guarantees. 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.

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

We operate in very competitive 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 evolving industry standards (particularly for our automation technology products and systems), which may require us to modify our products and systems. For example, when power transmission and distribution providers are privatized, their need typically increases for timely power product and solution innovations that improve efficiency and allow them to compete in a deregulated environment. Additionally, the continual development of advanced technologies for new products and product enhancements is an important way in which we maintain acceptable pricing levels. If we fail to keep pace with technological changes in the industrial sectors that we serve, we may experience price erosion and lower margins.

All of 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.

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 costs 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.

Our hedging activities may not protect us against the consequences of significant fluctuations in exchange rates, interest rates 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 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 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.

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 until we are able to establish a new supply arrangement. We may be unable to find a sufficient alternative supply channel in a reasonable time period or on commercially reasonable terms, if at all. 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.

An inability to protect our 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.

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, the 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. For example, in an industry such as power transmission, which historically has consisted of large and concentrated customers such as utilities, price competition has become a factor in determining which products and services will be selected by a customer. 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.

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, polyvinylchloride (PVC) resin to manufacture PVC cable and chloroparaffin 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 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 power technology divisions 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 technology divisions 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.

The United Kingdom's decision to withdraw from the European Union may have a negative effect on global economic conditions, financial markets and our business.

The United Kingdom's decision to withdraw from the European Union has created significant uncertainty about the future relationship between the United Kingdom and the European Union. The United Kingdom has formally initiated the withdrawal process and continues to negotiate the terms of its departure from the European Union, which is currently scheduled to take place on March 29, 2019, a date that can be extended by vote of the member nations. This has had and may continue to have a material effect on global economic conditions and the stability of global financial markets. 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. Any of these factors could have an adverse effect on our business, financial condition and results of operations.

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, 2017, employed about 135,000 people, of which approximately 47 percent were located in the Europe region, approximately 32 percent in the Asia, Middle East and Africa region and approximately 21 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. 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.

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 guarantees and performance 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 defined other 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 in our power and automation businesses.

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. In addition, the global financial crisis has made it more difficult and expensive to obtain these guarantees. 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.

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 law could result in higher tax expense and payments. Furthermore, this could materially impact our tax receivables and liabilities as well as deferred tax assets and deferred tax liabilities. In addition, the uncertainty of 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 liability, return 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.

The recent comprehensive tax reform in the United States could adversely affect our financial condition and results of operations.

The United States enacted comprehensive tax legislation that includes significant changes to the taxation of business entities. These changes include, among others, (i) a permanent reduction to the corporate income tax rate, (ii) a partial limitation on the deductibility of business interest expense, (iii) a shift of the U.S. taxation of multinational corporations from a tax on worldwide income to a territorial system (along with certain rules designed to prevent erosion of the U.S. income tax base) and (iv) a one-time tax on accumulated offshore earnings held in cash and illiquid assets, with the latter taxed at a lower rate. We are in the process of assessing the overall impact of the comprehensive tax legislation on our business and financial condition. Although currently such impact is not entirely clear, it is possible that our profitability and our business may be adversely affected as a result of the U.S. tax law changes made by this legislation.

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, this could have an adverse effect on our business.

Anticipated benefits of 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 from these transactions, including our agreement to acquire General Electric Company's Industrial Solutions business, 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.

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, both in general and against us, 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. While we attempt to mitigate these risks through a number of measures, including employee training, comprehensive monitoring of our networks and systems, and maintenance of backup and protective systems such as firewalls and virus scanners, our systems, networks, products, solutions and services remain potentially vulnerable to attacks. Similarly, we have observed a continued increase in attacks generally against industrial control systems as well as against our customers and the systems we supplied to them, which pose a risk to the security of those systems and networks. Depending on their nature and scope, such attacks could potentially lead to the compromising of confidential information, improper use of our systems and networks or those we supplied to our customers, manipulation, corruption and destruction of data, defective products or services, production downtimes and supply shortages, any of which in turn could adversely affect our reputation, competitiveness and results of operations.

If a material weakness were identified in our internal control over financial reporting, that could result in material inaccuracies in our consolidated financial statements and adversely affect our business and results of operations.

In connection with our financial results for the year ended December 31, 2016, we concluded that our internal control over financial reporting was ineffective as of December 31, 2016, due to a material weakness. Although we have remediated the material weakness as of December 31, 2017, we cannot be certain that the measures we have taken, and expect to take, to strengthen our internal control over financial reporting will be effective to prevent other material weaknesses from developing or being identified in the future. Any occurrence of a new material weakness may result in material inaccuracies in our consolidated financial statements and our business and results of operations may be materially adversely affected.

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.

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

Our strategy includes divesting certain non-core 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 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. If we do not successfully manage the risks associated with a divestiture, our business, financial condition, and results of operations could be adversely affected.

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 materially affect us in the future. We have incurred, and may need to incur additional costs to comply with these laws and regulations. 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.

Item 4. Information on the Company

INTRODUCTION

About ABB

ABB is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids serving customers in utilities, industry and transport & infrastructure globally. Continuing more than a 125-year history of innovation, ABB today is at the forefront of the industrial digitalization and driving the Energy and Fourth Industrial Revolutions. ABB operates in more than 100 countries with about 135,000 employees.

Our business is international in scope and we generate revenues in numerous currencies. We operate in approximately 100 countries across three regions: Europe, the Americas, and Asia, Middle East and Africa (AMEA). We are headquartered in Zurich, Switzerland.

We manage our business based on a divisional structure, comprised of four divisions: Electrification Products, Robotics and Motion, Industrial Automation and Power Grids. For a breakdown of our consolidated revenues (i) by operating division and (ii) derived from each geographic region in which we operate, see “Item 5. Operating and Financial Review and Prospects—Analysis of Results of Operations—Revenues”.

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 12040 Regency Parkway, Suite 200, Cary, North Carolina 27518.

History of the ABB Group

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

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

DIVISIONS

Our markets

As a pioneering technology leader serving the utilities, industry, and transport & infrastructure markets, ABB is at the heart of the Energy and Fourth Industrial Revolutions. The Energy Revolution encompasses a shift toward low carbon energy generation, including a dramatic increase in wind and solar generation capacity; a major shift toward distributed generation as opposed to centralized generation systems, whereby consumers also become producers, or prosumers, of energy; and finally the introduction of smart grids that will enable more efficient use of energy. The number of feed-in points from solar and wind is expected to continue to multiply, and transmissions are increasingly covering longer distances. At the same time, electricity demand is anticipated to rise, due to the accelerating take-up of electric vehicles (EVs) and significant increases in data storage needs. As a result, electrical systems are expected to require new equipment, technology and smart solutions to ensure that electricity supply remains reliable and secure.

In addition to the shifts in the energy market, digitalization is driving the Fourth Industrial Revolution and touches upon all our customer segments, creating sizeable new market opportunities. More than 55 percent of ABB products are already digitalized and offer connectivity. With the end-markets ABB serves still at an early stage of digitalization, including automotive, food and beverage, rail, buildings, oil and gas, chemicals, marine, utilities, and other discrete markets, ABB expects the demand for connected devices from the company's existing customer base to grow significantly in the coming years.

With the commercial launch of more than 210 digital ABB Ability™ solutions and services in 2017, ABB is unlocking value for customers as part of the Energy and Fourth Industrial Revolution. ABB Ability™ is the Company's unified, cross-industry digital portfolio, extending from device to edge to cloud on an open architecture platform. ABB Ability™ helps customers develop new processes and advance existing ones by providing insights and optimizing planning and controls for real-time operations. The results can then be fed into control systems to deliver customer value through the improvement of key metrics such as factory safety, uptime, speed and yield. Digital solutions provided by ABB Ability™ include performance management offerings for asset-intensive industries; control systems for process and discrete industries; remote monitoring services for robots, motors and machinery; and control solutions for buildings, EV charging networks and offshore platforms. Some of the more specialized offerings address energy management for data centers and navigation optimization for maritime shipping fleets, among many others.

Utilities Market

ABB focuses on delivering solutions that match the changing needs of utility customers with a complete offering for transmission and distribution. The Energy Revolution opens up numerous opportunities, and more than 30 percent of the market ABB operates in are high-growth segments within the sector, such as grid automation, high-voltage direct current (HVDC), software, grid control systems and micro-grids. Generation, transmission and distribution are being unbundled, long-standing monopolies now have competitors and new entrants (e.g. pension funds, insurance funds, project developers) are investing in the sector. Many traditional utilities are being forced to reinvent themselves; some are refocusing on renewables, others on providing additional services to the consumers they serve.

Utilities continued to make selective investments in 2017, adding new capacity in emerging markets, upgrading aging power infrastructure in mature markets and integrating new renewable energy capacity globally. They are also investing in automation and control solutions to enhance the stability of the grid and thus demand for ABB Ability™ solutions gained traction during the year.

ABB won orders in Sweden, Germany and the Democratic Republic of Congo to upgrade the control and protection system of existing HVDC links with advanced digitalization technologies. In addition, ABB was awarded several orders for ABB Ability™ based digital substations in the U.S., Poland and India. ABB's modular and containerized micro-grid solution, PowerStore™ was ordered by Chugach Electric in Alaska, to bring clean energy and power reliability to its local community.

Industry Market

ABB serves factories all around the world from discrete to process industries. Industry customers are diverse in nature and may be publicly traded or privately held companies. Energy efficiency and productivity improvements are the intended hallmarks of ABB's offerings in this customer segment. Through the acquisition of Bernecker + Rainer Industrie-Elektronik GmbH (B&R) in July 2017, ABB expanded its leadership in industrial automation and closed ABB's historic gap in machine and factory automation. ABB now offers a comprehensive automation portfolio for customers globally.

Investments in 2017 in robotics and machinery automation solutions from the automotive sector and the wider industry market generally remained positive. Process industries, especially mining and oil and gas, remained subdued, with selective investments made primarily in service and productivity improvements.

The need for cutting-edge solutions to increase efficiency and to use renewable power generation to lower environmental costs continued to be important demand drivers for industry in 2017. ABB introduced to the market an electric motor with almost 100 percent energy efficiency, which is designed to significantly reduce energy consumption and operating costs. In order to meet the increasing demand for storage solutions, ABB entered into a wide-ranging supply and technology partnership with Northvolt AB for Europe's largest and most advanced lithium-ion battery factory in Sweden. Industrial customers also continued to invest in reliable power. In this context, ABB won an order from Semiconductor Manufacturing International Corporation (SMIC) for ABB Ability™ iVD4® power distribution solution. In robotics, ABB presented to the market a preview of its newest collaborative robot, a compact small-parts assembly robot with a single arm, that aims to build on the success of YuMi®, the world's first collaborative dual-arm industrial robot.

Transport & Infrastructure Market

ABB's expertise provides efficient and reliable solutions for transport and infrastructure customers. We believe our offerings are key to transport customers that are focused on energy efficiency and reduced operating costs. Other major growth drivers for this customer segment are urbanization, the move to electrify transportation, and growth in data centers.

Demand in transport and infrastructure markets was mixed in 2017. Demand for building automation solutions as well as solutions involving energy efficiency remained strong, while the marine sector, except for cruise ships, suffered because of subdued activity in the container vessel and oil and gas sector. In rail, ABB won orders worth \$70 million from Swiss train manufacturer Stadler Rail to supply traction and onboard power equipment to three European rail operators.

A highlight of 2017 was the ongoing development of EV charging markets. Demand for ABB Ability™ EV charging infrastructure — from grid to socket, supporting all charging standards — is accelerating. ABB received multiple orders from customers in several countries across Europe and North America for EV fast chargers as well as for electric bus charging stations. ABB also introduced to market e-buses with world-record speed flash-charging technology.

As a global pioneering technology leader, we serve utilities, industry and transport & infrastructure customers through our business divisions. These markets and our divisions are discussed in more detail below. Revenue figures presented in this Divisions section are before interdivisional eliminations.

Electrification Products Division

Overview

The Electrification Products division provides solutions across the full electrical value chain from the substation to the point of consumption. The innovations from this business enable a safer and more reliable electrical flow, with a full range of low- and medium-voltage products and solutions for intelligent protection and connection as well as pre-engineered packaged solutions and services tailored to customers' needs. The portfolio — within increasingly digital and connected solutions — includes modular substation packages, distribution automation products, switchgear, circuit breakers, measuring and sensing devices, control products, wiring accessories, and enclosures and cabling systems, including KNX systems (global standard for home and building control) designed to integrate and automate a building's lighting, heating and ventilation, and security and data communication networks.

The division delivers products to customers through a global network of channel partners and end-customers. Most of the division's revenue is derived from sales through distributors, wholesalers, original equipment manufacturers (OEMs), system integrators, utilities and panel builders, with some direct sales to end-users, utilities and other ABB divisions.

The Electrification Products division had approximately 42,200 employees as of December 31, 2017, and generated \$10.1 billion of revenues in 2017.

Customers

The Electrification Products division serves a wide range of customers who are connecting, protecting and controlling electricity from a number of industry segments including buildings, data centers, rail, wind and solar, food and beverage, marine, and oil and gas.

Products and Services

The Protection and Connection business offers products that protect, control and connect people, plants and systems. ABB offers solutions to restore power rapidly in case of a fault and helps provide optimum protection for people and electrical installations. The product offering ranges from miniature circuit breakers to high-capacity molded-case and air-circuit breakers and includes safety switches used for power distribution in factories and buildings, switchgear systems for short circuit and overload protection as well as cabling and connection components. In addition, the business offers terminal blocks, a range of contactors, starters, proximity sensors, safety products for industrial protection, limit switches and manual motor starters, along with electronic relays and overload relays.

The Building Products business provides smart home and intelligent building control systems, also known as KNX protocol, to optimize efficiency, safety and comfort through the automated management of lighting, shutters and security. In addition, the business supplies conventional wiring accessories, industrial plugs and sockets, and enclosures ideal for single family homes, multiple dwellings, commercial buildings, infrastructure and industrial applications.

The Installation Products business offers products for low-voltage wire and cable management, making the task of fastening, protecting, insulating and connecting wires easier and quicker for industrial applications, construction, communications, utility and OEM professionals, as well as do-it-yourself specialists. The business offers emergency lighting and lighting for explosive environments, as well as lightning protection and earth grounding apparatus.

The Medium Voltage Products business helps utility, industry and transport & infrastructure customers to improve power quality and control, reduce outage time and enhance operational reliability and efficiency. The business offers products and services that largely serve the power distribution sector, often providing the link between high-voltage transmission systems and low-voltage users. Its comprehensive offering includes medium-voltage equipment (1 to 50 kilovolts), indoor and outdoor circuit breakers, reclosers, fuses, contactors, relays, instrument transformers, sensors, motor control centers, ring main units for primary and secondary distribution, as well as a range of air- and gas-insulated switchgear. It also produces indoor and outdoor modular systems and other solutions to facilitate efficient and reliable power distribution.

The Electrification Solutions business offers systems solutions to customers across low- and medium-voltage applications, integrating the entire offering from the division into complete solutions for customers, adding value through design, engineering, project management and service.

The Power and Electric Vehicle Infrastructure business supplies power generation products and solutions including electric vehicle charging and solar inverters for residential, commercial and utility applications, solar packages with integrated energy storage solutions and power protection solutions such as UPS (uninterruptible power supplies) solutions, status transfer switches, power distribution units, power converters, and fuel cell inverters. In electro mobility, ABB has been offering rapid charging solutions with more than 5,000 networked systems for passenger cars and commercial vehicles installed worldwide. ABB's portfolio of DC fast charging solutions ranges from 20kW wall boxes to ultra-fast charging solutions for cars and 600kW electric buses. In 2017, ABB introduced a leading technology for flash-charging and onboard traction equipment which recharges buses in 20-second bursts at stops, while passengers are embarking and disembarking. This technology is designed to deliver higher passenger capacity, lower noise and emission-free public transport.

In addition, the service offerings of the Electrification Products division span the entire value chain, from the moment a customer makes the first inquiry to disposal and recycling of the product. Throughout the value chain, ABB provides training, technical support and customized contracts. All of this is supported by an extensive global sales and service network.

Sales and Marketing

Sales are primarily made through indirect sales channels such as distributors and wholesalers to end customers including installers and system integrators. Direct customers include utilities, panel builders and machine builders, as well as other ABB divisions. The proportion of direct sales compared to channel partner sales varies among the different industries, product technologies and geographic markets. The business is focused on creating demand to support its channel sales, with a range of promotional activities and support services including configuration and other digital solutions.

Competition

The Electrification Products division's principal competitors vary by product line, but they include Eaton Corporation, Legrand, Schneider, Siemens, Hubbell, Leviton, Rittal and Chint Electrical.

Capital Expenditures

The Electrification Products division's capital expenditures for property, plant and equipment totaled \$218 million in 2017, compared to \$215 million and \$228 million in 2016 and 2015, respectively. Investments in 2017 were primarily related to footprint changes, equipment replacement and upgrades. Geographically, in 2017, Europe represented 56 percent of the capital expenditures, followed by the Americas (32 percent) and AMEA (12 percent).

Robotics and Motion Division

Overview

The Robotics and Motion division provides products, solutions and related services that increase industrial productivity and energy efficiency. Our key products such as motors, generators, drives and robotics provide power, motion and control for a wide range of automation applications. The leading position in wind generators and propulsion converters complement the industrial focus, leveraging joint technology, channels and operations platforms.

Revenues are generated both from direct sales to end-users as well as from indirect sales through distributors, machine builders, system integrators, and OEMs.

The Robotics and Motion division had approximately 27,100 employees as of December 31, 2017, and generated \$8.4 billion of revenues in 2017.

Products and Services

The Robotics business offers robots, controllers, software systems, as well as complete robot automation solutions and a comprehensive range of advanced services for automotive and Tier One OEMs as well as for general industry. These provide flexibility for manufacturers to meet the challenge of making smaller lots of a larger number of specific products in shorter cycles for today's dynamic global markets, while also improving quality, productivity and reliability. 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. In the automotive industry, robot products and systems are used in such areas as press shop, body shop, paint shop, power train assembly, trim and final assembly. General industry segments in which robotics solutions are used range from metal fabrication, foundry, plastics, food and beverage, chemicals and pharmaceuticals, electronics and warehouse/logistics center automation. Typical robotic applications in general industry include welding, material handling, machine tending, painting, picking, packing, palletizing and small parts assembly automation.

The Motors and Generators business supplies a comprehensive range of electrical motors, generators, and mechanical power transmission products. The range of electrical motors includes high efficiency motors that conform to leading environmental and Minimum Energy Performance Standards (MEPS). Efficiency is an important selection criterion for customers, because electric motors account for nearly two-thirds of the electricity consumed by industrial plants. The business unit manufactures synchronous motors for the most demanding applications and a full range of low- and high-voltage induction motors, for both IEC (International Electrotechnical Commission) and NEMA (National Electrical Manufacturers Association) standards. The business unit also offers solutions that monitor motor performance and provide vital intelligence on key operating parameters. These products and solutions help customers improve uptime, extend motor lifetimes, and increase productivity while becoming or remaining digitally connected.

The Drives business provides low-voltage and medium-voltage drives and systems for industrial, commercial and residential applications. Drives provide speed, torque and motion control for equipment such as fans, pumps, compressors, conveyors, centrifuges, mixers, hoists, cranes, extruders, printing and textile machines. They are used in industries such as building automation, marine, power, transportation, food and beverage, metals, mining, and oil and gas. The business unit also supplies traction converters (propulsion converters and auxiliary converters) for the transportation industry and wind converters.

The division also offers services that complement its products and solutions, including design and project management, engineering, installation, training and life cycle care, energy efficiency appraisals, preventive maintenance and digital services such as remote monitoring and software tools.

Customers

The Robotics and Motion division serves a wide range of customers. Customers include machinery manufacturers, process industries such as pulp and paper, oil and gas, and metals and mining companies, hybrid and batch manufacturers such as food and beverage companies, transportation equipment manufacturers, discrete manufacturing companies such as “3C” (computer, communication and consumer electronic), utilities as well as customers in the automotive industry.

Sales and Marketing

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

Competition

The Robotics and Motion division’s principal competitors vary by product line but include Fanuc Robotics, Kuka Robot Group, Rockwell Automation, Schneider, Siemens, Yaskawa and WEG Industries.

Capital Expenditures

The Robotics and Motion division’s capital expenditures for property, plant and equipment totaled \$118 million in 2017, compared to \$112 million and \$126 million in 2016 and 2015, respectively. Principal investments in 2017 were primarily related to equipment replacement, footprint adjustments and automation upgrades. Geographically, in 2017, Europe represented 46 percent of the capital expenditures, followed by the Americas (32 percent) and AMEA (22 percent).

Industrial Automation Division

Overview

The Industrial Automation division offers customers solutions that are designed to optimize the productivity, energy efficiency and safety of their industrial processes by combining the division's integrated control products, systems and service offerings with deep domain and process expertise of each end market. Solutions include turnkey engineering, control systems, measurement products, lifecycle services, outsourced maintenance and industry-specific products such as electric propulsion for ships, Azipods, mine hoists, turbochargers and pulp and paper quality control equipment. The systems can link various processes and information flows which allows customers to manage their entire manufacturing and business process based on real-time access to plant information. Additionally, the systems allow customers to increase production efficiency, optimize their assets and reduce environmental waste. Some of the products from the Robotics and Motion, Power Grids and Electrification Products divisions are integrated into the process control and electrification solutions offered by the Industrial Automation division.

The Industrial Automation division offerings are available as separately sold products or as part of a total automation, electrification and/or instrumentation system. The division's technologies are sold primarily through direct sales forces as well as third-party channels.

The division had approximately 27,100 employees as of December 31, 2017, and generated revenues of \$6.9 billion in 2017.

Customers

The Industrial Automation division's end customers are primarily companies in the oil and gas, minerals and mining, metals, pulp and paper, chemicals and pharmaceuticals, food and beverage, power generation and marine industries. These customers are looking for complete automation, instrumentation, and electrification solutions that deliver value mainly through lower capital costs, increased plant availability, lower life-cycle costs and reduced project costs.

Products and Services

The Oil, Gas and Chemicals business provides solutions across the entire hydrocarbon value chain, from exploration and production to supply, transport and distribution, as well as refining, chemicals and petrochemicals. ABB specializes in mastering the control loop and transforming client operations through actionable insights that optimize performance in real time. From the well head to the refinery, ABB technologies connect people with data to optimize performance, improve reliability, enhance efficiency and minimize environmental impact from project start-up throughout the entire plant life cycle.

Other Process Industry markets served include mining, minerals processing, metals, pharmaceuticals and pulp and paper as well as their associated service industries. The business' added value is deep industry expertise coupled with the ability to integrate both automation and electronics, resulting in faster start-up times, increased plant productivity and reduced overall capital and operating costs for customers. For mining, metals and cement industries, solutions include specialized products and services, as well as total production systems. The business designs, plans, engineers, supplies, erects and commissions 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. In the pharmaceuticals and fine chemicals areas, the business offers applications to support manufacturing, packaging, quality control and compliance with regulatory agencies. The offering for the pulp and paper industries includes quality control systems, control systems, drive systems, on-line sensors, actuators and field instruments.

ABB serves the power generation market with leading automation solutions for all types of power generation such as coal, gas, combined-cycle, waste-to-energy as well as renewable sources such as hydro, solar, wind and biomass. With an offering that includes instrumentation, excitation and control systems, ABB technologies help optimize performance, improve reliability, enhance efficiency and minimize environmental impact throughout the plant life cycle. The business also serves the water industry, including applications such as pumping stations and desalination plants.

ABB services the Marine and Ports business through its leading solutions for specialty vessels, container and bulk cargo handling. For the shipping industry, ABB offers an extensive portfolio of integrated marine systems and solutions that improve the flexibility, reliability and energy efficiency of vessels. By coupling power, automation and marine software, proven fuel-efficient technologies and services that ensure maximum vessel uptime, ABB is in the position to improve the profitability of a customer's business throughout the entire life cycle of a fleet. ABB designs, engineers, builds, supplies and commissions automation and electrical systems for marine power generation, power distribution and electric propulsion, as well as turbochargers to improve efficiency. With ABB's integrated operations centers around the world and marine software solutions, owners and operators can run their fleets at lower fuel and maintenance cost, while improving crew, passenger, and cargo safety and overall productivity of their operations. In addition, ABB delivers automation and electrical systems for container and bulk cargo handling — from ship to gate. The systems and services 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.

ABB offers an extensive portfolio of products and software from stand-alone basic control to integrated collaborative systems for complex or critical processes. One of the solutions, System 800xA, provides a scalable extended automation system for process and production control, safety, and production monitoring. Freelance, another solution, is a full-fledged, easy-to-use distributed control system for small to medium size applications. The PLC Automation portfolio offers a scalable range for small, middle and high-end applications. Components for basic automation solutions, process and safety controllers, field interfaces, panels, process recorders and HMI (Human Machine Interfaces) are available through our Compact Product Suite offering. The product portfolio is complemented by Automation Sentinel, a subscription-based life cycle management program that provides services to maintain and continually advance and enhance ABB control systems (e.g. cyber security patches) and thus allows it to manage a customer's life cycle costs. The Advanced Services offering provides individual software-based services to continuously improve automation and processes. ABB also offers Manufacturing Execution Systems that create agility and transparency for production processes by synchronizing and orchestrating a flow across individual automation islands. An interactive software platform, Decathlon Software, combines plant operations data from control systems, enterprise resource planning (ERP) and other data sources into actionable information for decision-makers, creating additional customer value. ABB focuses strongly on the human factor and thus offers operator interfaces from panels to holistic control room solutions with ergonomic furniture and control centers to drive productivity, quality and safety to new levels.

The offerings of the Measurement and Analytics business are designed to measure product properties, such as weight, thickness, color, brightness, moisture content and additive content. Actuators allow the customer to make automatic adjustments during the production process to improve the quality and consistency of the product. Field instruments measure properties of the process, such as flow rate, chemical content and temperature. The business also offers a full line of instrumentation and analytical products to analyze, measure and record industrial and power processes.

ABB manufactures and maintains turbochargers for diesel and gas engines having power levels ranging from 500 kilowatts to over 80 megawatts. The business provides engine builders and application operators with advanced turbocharging solutions for efficient and flexible application operations and in compliance with the most stringent environmental requirements.

In July 2017, ABB acquired B&R, the largest independent provider focused on product- and software-based, open-architecture solutions for machine and factory automation worldwide. This acquisition closes ABB's historic gap in machine and factory automation and is anticipated to create a comprehensive automation portfolio for customers globally. ABB combines state-of-the-art technology with advanced engineering to provide a wide range of customers with complete solutions for machine and factory automation, motion control, HMI and integrated safety technology. With Industrial Internet of Things communication standards like OPC Unified Architecture, POWERLINK and openSAFETY as well as the powerful Automation Studio software development environment, B&R strives to redefine the future of automation engineering. In addition, ABB offers a complete range of lifecycle services across all customer segments to help customers optimize their assets. Demand for process automation services is driven by customers seeking to increase productivity by improving the performance of existing equipment.

Sales and Marketing

The Industrial Automation division primarily uses 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 division's own direct sales channels.

Competition

The Industrial Automation division's principal competitors vary by industry or product line. Competitors include Emerson, Honeywell, Valmet, Rockwell Automation, Beckhoff Automation, Schneider, Siemens, Voith, and Yokogawa Electric Corporation.

Capital Expenditures

The Industrial Automation division's capital expenditures for property, plant and equipment totaled \$71 million in 2017, compared to \$53 million and \$57 million in 2016 and 2015, respectively. Principal investments in 2017 were in the Turbocharging and the Measurement and Analytics businesses. Geographically, in 2017, Europe represented 70 percent of the capital expenditures, followed by the Americas (17 percent) and AMEA (13 percent).

Power Grids Division

Overview

The Power Grids division is a global leader in power technologies and aspires to be the partner of choice for enabling a stronger, smarter and greener grid. The Power Grids division provides product, system, software and service solutions across the power value chain that are designed to meet the growing demand for electricity with minimum environmental impact. These solutions support utility, industry and transport & infrastructure customers to plan, build, operate and maintain their power infrastructure. They are designed to facilitate the safe, reliable and efficient integration, transmission and distribution of bulk and distributed energy generated from conventional and renewable sources.

Approximately three quarters of the division's revenues come from utility customers and the remaining portion is generated from industry and transport & infrastructure customers. Power Grids has a worldwide customer base, with a wide spread of revenues from a regional perspective across the Americas, Europe and AMEA. The division also has a globally diversified and well balanced manufacturing and engineering footprint. Direct sales account for a significant part of the division's total revenues and external channel partners such as wholesalers, distributors and OEMs account for the rest.

The division had approximately 36,400 employees as of December 31, 2017, and generated \$10.4 billion of revenues in 2017.

Customers

The Power Grids division's principal customers include transmission and distribution operators and owners as well as utilities and industrial, transportation and infrastructure customers.

Products and Services

The Grid Automation business is at the forefront of grid automation and digitalization. It supplies substation automation products, systems and services. It also provides Supervisory Control and Data Acquisition (SCADA) systems for transmission and distribution networks as well as a range of wireless, fiber optic and power line carrier-based telecommunication technologies for mission critical applications. This business offers microgrid solutions that are being increasingly deployed for remote and partially grid-connected applications. Also included in this business is the enterprise software portfolio – a provider of an industry-leading suite of software solutions that help utilities and other asset-intensive industries (e.g. rail, mining) manage, maintain and optimize their assets.

The Grid Integration business is among the world's leading providers of transmission and distribution substations, associated life-cycle services and HVDC systems. The substations are provided either as engineered solutions (system integration) or on a turnkey, engineering, procurement, construction (EPC) basis, for utility and non-utility applications including renewables, rail, data-centers, industry, battery energy storage and shore-to-ship power supply. The HVDC systems use Line Commutated Converter (HVDC Classic) technology or Voltage Sourced Converter (HVDC Light) technology. The Grid Integration portfolio also includes the Flexible Alternating Current Transmission Systems (FACTS) business, which comprises Static Var Compensation (SVC) and static compensator (STATCOM) technology. These systems stabilize voltages, minimize losses, and keep power quality in accordance with grid codes. The Grid Integration business's portfolio also includes a range of high power semiconductors, a core technology for power electronics deployed in HVDC, FACTS and rail applications.

The High Voltage products business is a global leader in 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 manufactures generator circuit breakers, a key product for integrating large power plants into the grid. The portfolio also includes a broad range of capacitors and filters that facilitate power quality as well as instrument transformers and other substation components.

The Transformers business supplies transformers that are an integral component found across the power value chain, enabling the efficient and safe conversion of electricity to different voltages. ABB is the world's largest maker of transformers. The product range is designed for reliability, durability and efficiency with a portfolio that includes power transformers, dry- and liquid-distribution transformers, traction transformers for rail applications, and special application transformers and related components such as insulation kits, bushings and other transformer accessories. In addition, ABB's power transformers are pushing the voltage barrier to unprecedented levels of 1100 kV DC and 1200 kV AC, facilitating more power to be transported longer distances with minimum losses. Other technology developments include grid-resilient transformers designed to withstand physical attack, eco-efficient transformers using biodegradable oil and innovative sensor-based as well as software-leveraging solutions for remote maintenance and asset optimization.

The division also has an extensive portfolio of service offerings. This is a growing focus area, leveraging the significant installed product base. The portfolio includes 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 are being added to the portfolio to enable digitalization of grids. ABB Ability™, the company's unified, cross-industry digital capability supports the portfolio with devices, systems, solutions, services and a platform that enable customers to know more, do more and do better.

Competition

On a global basis, the Power Grids division faces worldwide competition across its portfolio mainly from Siemens and General Electric (GE Alstom). It also competes in specific geographies and in parts of the business with companies such as Hyundai, Hyosung, Crompton Greaves, TBEA and NARI. The breadth of its portfolio, technology and innovation, a global footprint and a vast installed base, enable the division to maintain its leading position in the power sector.

Capital Expenditure

The Power Grids division's capital expenditures for property, plant and equipment totaled \$171 million in 2017, compared to \$172 million and \$150 million in 2016 and 2015, respectively. Principal investments in 2017 were related to capacity expansion as well as the replacement of existing equipment, particularly in Sweden, the U.S. and Switzerland. Geographically, in 2017, Europe represented 60 percent of the capital expenditures, followed by the Americas (25 percent) and AMEA (15 percent).

Corporate and Other

Corporate and Other includes headquarters, central research and development, real estate activities, Group Treasury Operations, Global Business Services (GBS) and other minor business activities. In addition, we have classified the historical business activities of significant divested businesses in Corporate and Other.

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

Corporate research and development primarily covers our research activities, as our development activities are organized under the four business divisions. We have two global research laboratories, one focused on power technologies and the other focused on automation technologies, which both work on technologies relevant to the future of our four business divisions. Each laboratory works on new and emerging technologies and collaborates with universities and other external partners to support our divisions in advancing relevant technologies and in developing cross-divisional technology platforms. We have corporate research centers in seven countries (China, India, Germany, Poland, Sweden, Switzerland and the U.S.).

GBS operates in several hub locations and consists of shared services in the area of accounting, human resources, information systems and supply chain management. The costs for GBS are allocated to the operating divisions.

Corporate and Other had approximately 2,000 employees at December 31, 2017.

CAPITAL EXPENDITURES

Total capital expenditures for property, plant and equipment and intangible assets (excluding intangibles acquired through business combinations) amounted to \$949 million, \$831 million, \$876 million in 2017, 2016 and 2015, respectively. In 2017, 2016 and 2015, capital expenditures were 14 percent, 27 percent and 24 percent lower, respectively, than depreciation and amortization. Excluding acquisition-related amortization, capital expenditures were 13 percent higher, 3 percent lower and 3 percent higher, respectively, than depreciation and amortization.

Capital expenditures in 2017 remained at a significant level in mature markets, reflecting the geographic distribution of our existing production facilities. Capital expenditures in Europe and North America in 2017 were driven primarily by upgrades and maintenance of existing production facilities, mainly in the U.S., Sweden, Switzerland, Italy and Germany. Capital expenditures in emerging markets were highest in China, Poland and India. Capital expenditures in emerging markets were made primarily to increase production capacity by investing in new or expanded facilities. The share of emerging markets capital expenditures as a percentage of total capital expenditures in 2017, 2016 and 2015 was 31 percent, 35 percent and 31 percent, respectively.

At December 31, 2017, construction in progress for property, plant and equipment was \$700 million, mainly in China, the U.S., Sweden, Switzerland and Germany. At December 31, 2016, construction in progress for property, plant and equipment was \$515 million, mainly in the U.S., China, Sweden, Switzerland and Germany while at December 31, 2015, construction in progress for property, plant and equipment was \$559 million, mainly in Sweden, the U.S., China, Switzerland and Germany.

Our capital expenditures relate primarily to property, plant and equipment. For 2018, 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 businesses and key countries. Our supply chain management network consists of a number of teams, each focusing on different product categories. These category teams, on global, divisional and/or regional level, take advantage of opportunities to leverage the scale of ABB and to optimize the efficiency of our supply networks, in a sustainable manner.

Our supply chain management organization's activities have continued to expand in recent years, to:

- 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 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 hedges. For example, we manage copper 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 hedging 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 2017 supply chain management personnel in our businesses, and in the countries in which we operate, along with the global category teams, continued to focus on value chain optimization efforts in all areas, while maintaining and improving quality and delivery performance.

In August 2012, the United States Securities and Exchange Commission (SEC) issued its final rules regarding "Conflict Minerals", as required by section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act. We initiated conflict minerals processes in 2013 and have continuously improved and tailored the processes to our value chain. We continue to work with our suppliers and customers, to enable us to comply with the rules and disclosure obligations. Further information on ABB's Conflict Minerals policy and supplier requirements can be found under "Material Compliance" at new.abb.com/about/supplying

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. Over the past ten years, we have continued to substantially add new applications to our existing first patent filings, and we intend to continue our aggressive approach to seeking patent protection. Currently, we have approximately 25,200 patent applications and registrations, of which more than 7,900 are pending applications. In addition to these patents, we have more than 3,600 utility model and design applications and registrations, of which approximately 500 are pending applications. In 2017, we filed more than 700 patent, utility model and design applications for more than 1,800 new inventions. 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 aggressively defend 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 management is one of our highest business priorities. We seek to address sustainability issues in all our business operations in order to improve our social, health, safety and environmental performance continuously, and to enhance the quality of life in the communities and countries where we operate.

Our social, health, safety and environmental efforts include:

- implementing sustainability objectives covering all relevant parts of our operations,
- joining initiatives that foster economic, environmental, social and educational development, and strengthen observance of human rights in business practice,
- making positive contributions in the communities where we operate so they welcome us and consider ABB a good neighbor, an attractive employer and a good investment,
- offering our customers eco-efficient products that save energy and are safe to use, that optimize the use of natural resources, minimize waste and reduce environmental impact over their complete life cycles,
- applying non-financial risk assessment to key business decision-making processes, and to projects,
- sharing our latest technologies with emerging markets by, for example, helping customers in developing countries implement environmentally sound processes and technologies and providing environmental awareness and safety training to our business partners,
- ensuring that our operations and processes comply with applicable environmental and health and safety standards and social legislation. Specifically, every operating unit must implement an environmental management system that seeks to continuously improve its environmental performance and a health and safety management system that similarly seeks to continuously improve health and safety performance,
- ensuring that our social, health and safety and environmental policies are communicated and implemented,
- working towards achieving best practices in occupational health and safety, and ensuring the health and safety of our employees, contractors and others involved in or affected by our activities,
- ensuring that suppliers have sustainability policies and systems that are comparable with our own, and
- continuing our program to decontaminate sites that were polluted by historical manufacturing processes.

To manage environmental aspects of our own operations, we have implemented environmental management systems according to the ISO 14001 standard at our manufacturing and service sites. For non-manufacturing sites we have implemented an adapted environmental management system in order to ensure management of environmental aspects and continual improvement of performance. Globally, operations at 396 sites and offices are covered by externally certified environmental management systems.

We have Environmental Product Declarations to communicate the environmental performance of our core products. These describe the significant environmental aspects and impacts of a product line, viewed over its complete life cycle. Declarations are based on Life Cycle Assessment studies, created according to the international standard ISO/TR 14025. Approximately 70 declarations for major product lines are published on our Web site (www.abb.com), some of which have been externally certified.

In 2017, approximately 91 percent of our employees were covered by confirmed data gathered through ABB's formal environmental reporting system that is verified by an independent verification body. The operations of companies acquired during 2017 are not yet covered by our environmental reporting. We expect that this reporting will be implemented in 2018. The remaining parts of our business that are not yet covered by our environmental reporting system, mainly sales, have very limited environmental exposure. A total of 41 environmental incidents were reported in 2017, none of which had a material environmental impact.

In 2017, substantially all of our employees were covered by confirmed data gathered through ABB's formal social reporting system that is verified by an independent verification body. The remaining parts of our business that are not yet covered by our social reporting system, mainly sales offices in countries where we do not perform manufacturing, have very limited social exposure.

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. and several European nations 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. With the partial lifting of international sanctions, from January 2016, ABB started to seek business opportunities in Iran. In 2016 and 2017, certain non-U.S. subsidiaries of ABB, in accordance with applicable laws, provided electrical equipment and automation systems to local OEMs, distributors, panel builders, engineering, procurement, construction (EPC) contracting companies and on-site services to customers based in Iran. The revenues attributable to these products and services in 2017 amounted to approximately \$35 million. We are abiding by remaining applicable sanctions.

ORGANIZATIONAL STRUCTURE

ABB Ltd is the ultimate parent company of the ABB Group. Its sole shareholding is in 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, 2017, 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 “Divisions” section of Item 4.

<u>Company name/location</u>	<u>Country</u>	<u>ABB interest %</u>
SARPI - Société Algérienne pour la réalisation de projets industriels, Alger	Algeria	50.00
ABB S.A., Buenos Aires	Argentina	100.00
ABB Australia Pty Limited, Moorebank, NSW	Australia	100.00
ABB Group Investment Management Pty. Ltd., Moorebank, NSW	Australia	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 Ltda., São Paulo	Brazil	100.00
ABB Bulgaria EOOD, Sofia	Bulgaria	100.00
ABB Canada Holding Limited Partnership, Saint-Laurent, Quebec	Canada	100.00
ABB Inc., Saint-Laurent, Quebec	Canada	100.00
Thomas & Betts Limited, Saint-Jean-sur-Richelieu, Quebec	Canada	100.00
ABB Beijing Drive Systems Co. Ltd., Beijing	China	90.00

<u>Company name/location</u>	<u>Country</u>	<u>ABB interest %</u>
ABB (China) Ltd., Beijing	China	100.00
ABB Engineering (Shanghai) Ltd., Shanghai	China	100.00
ABB High Voltage Switchgear Co. Ltd., Beijing	China	60.00
ABB Xiamen Low Voltage Equipment Co. Ltd., Xiamen	China	100.00
ABB Xiamen Switchgear Co. Ltd., Xiamen	China	64.30
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	99.83
ABB SAS, Cergy Pontoise	France	100.00
ABB AG, Mannheim	Germany	100.00
ABB Automation GmbH, Mannheim	Germany	100.00
ABB Automation Products GmbH, Ladenburg	Germany	100.00
ABB Beteiligungs- und Verwaltungsges. mbH, Mannheim	Germany	100.00
ABB Stotz-Kontakt GmbH, Heidelberg	Germany	100.00
Busch-Jaeger Elektro GmbH, Lüdenscheid	Germany	100.00
ABB Holding Ltd., Hong Kong	Hong Kong	100.00
ABB (Hong Kong) Ltd., Hong Kong	Hong Kong	100.00
ABB Global Industries and Services Private Limited, Bangalore	India	100.00
ABB India Limited, Bangalore	India	75.00
ABB S.p.A., Milan	Italy	100.00
Power-One Italy S.p.A., Terranuova Bracciolini (AR)	Italy	100.00
ABB K.K., Tokyo	Japan	100.00
ABB Ltd., Seoul	Korea, Republic of	100.00
ABB Mexico S.A. de C.V., San Luis Potosi SLP	Mexico	100.00
Asea Brown Boveri S.A. de C.V., San Luis Potosi SLP	Mexico	100.00
ABB B.V., Rotterdam	Netherlands	100.00
ABB Capital B.V., Rotterdam	Netherlands	100.00
ABB Finance B.V., Rotterdam	Netherlands	100.00
ABB Holdings B.V., Rotterdam	Netherlands	100.00
ABB Investments B.V., Rotterdam	Netherlands	100.00
ABB AS, Billingstad	Norway	100.00
ABB Holding AS, Billingstad	Norway	100.00
ABB Business Services Sp. z o.o., Warsaw	Poland	99.92
ABB Sp. z o.o., Warsaw	Poland	99.92
ABB Ltd., Moscow	Russian Federation	100.00
ABB Contracting Company Ltd., Riyadh	Saudi Arabia	95.00
ABB Electrical Industries Co. Ltd., Riyadh	Saudi Arabia	65.00

<u>Company name/location</u>	<u>Country</u>	<u>ABB interest %</u>
ABB Holdings Pte. Ltd., Singapore	Singapore	100.00
ABB Pte. Ltd., Singapore	Singapore	100.00
ABB Holdings (Pty) Ltd., Longmeadow	South Africa	100.00
ABB South Africa (Pty) Ltd., Longmeadow	South Africa	74.91
Asea Brown Boveri S.A., Madrid	Spain	100.00
ABB AB, Västerås	Sweden	100.00
ABB Norden Holding AB, Västerås	Sweden	100.00
ABB Asea Brown Boveri Ltd, Zurich	Switzerland	100.00
ABB Information Systems Ltd., Zurich	Switzerland	100.00
ABB Investment Holding GmbH, Zurich	Switzerland	100.00
ABB Management Services Ltd., Zurich	Switzerland	100.00
ABB Schweiz AG, Baden	Switzerland	100.00
ABB Turbo Systems AG, Baden	Switzerland	100.00
ABB LIMITED, Bangkok	Thailand	100.00
ABB Elektrik Sanayi A.S., Istanbul	Turkey	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 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 Treasury Center (USA), Inc., Wilmington, DE	United States	100.00
Baldor Electric Company, Fort Smith, AR	United States	100.00
Edison Holding Corporation, Wilmington, DE	United States	100.00
Thomas & Betts Corporation, Knoxville, TN	United States	100.00
Verdi Holding Corporation, Wilmington, DE	United States	100.00

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

DESCRIPTION OF PROPERTY

As of December 31, 2017, 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 are situated in the U.S., China, Sweden, Germany, Italy, Finland, India, Switzerland, Canada and Poland. 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.

The net book value of our property, plant and equipment at December 31, 2017, was \$5,363 million, of which machinery and equipment represented \$2,225 million, land and buildings represented \$2,438 million and construction in progress represented \$700 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

Not applicable

Item 5. Operating and Financial Review and Prospects

MANAGEMENT OVERVIEW

In 2017, ABB continued to deliver on its Next Level strategy which aims to unlock value and deliver attractive shareholder returns. 2017 was a transition year, in which ABB streamlined and strengthened its portfolio and operations. ABB continued to shift its center of gravity to a simplified, strengthened, digital and market-leading portfolio. It completed and announced a number of key acquisitions, divested certain businesses and took the actions necessary to implement business model changes. ABB strengthened its operations through the completion of its 1,000-day programs. It continued to focus on operational excellence, delivering supply chain and operational cost savings. A number of key executive committee appointments were made in 2017 while continuing to focus on leadership development and bringing all of ABB under one unified brand. With these transformational actions complete, we believe ABB is positioned for profitable growth.

Profitable growth

As part of the drive towards profitable growth, ABB made significant progress in 2017 to streamline and strengthen its portfolio. Base order growth momentum continued each quarter and was higher in all divisions and regions for the full year.

With the launch of ABB Ability™ in March 2017, ABB is making a quantum leap in digital. With more than 210 ABB Ability™ solutions available today, ABB is leveraging its large installed base of connected systems and devices. ABB Ability™ is a solution-led approach based on ABB's strong portfolio and domain expertise. It has a secure, open-architecture system, ranging from edge to cloud. ABB Ability™ is central to ABB's strategy to drive growth through expansion of high value-added solutions and services.

Through active portfolio management, ABB has become more streamlined and strengthened. We believe these actions continue to shift ABB's center of gravity towards strengthened competitiveness, higher growth market segments and lower risk.

In 2017, ABB strengthened its position as a global leader in industrial automation by completing the acquisition of B&R in July. B&R was the largest independent provider of product- and software-based open-architecture solutions for machine and factory automation worldwide. With this acquisition, ABB closed its historic gap in machine and factory automation and created a comprehensive automation portfolio for customers globally.

In September 2017, ABB announced an agreement to acquire General Electric Company's (General Electric or GE) Industrial Solutions business (GE IS), General Electric's global electrification solutions business. GE IS operates in more than 100 countries and has an established installed base with strong roots in North America. We believe this purchase strengthens ABB's position as a global leader in electrification and expands its access to the large North American market. The transaction is expected to close in the first half of 2018.

In 2017, ABB continued to shape its portfolio with the divestment of its high-voltage cables and cables accessories businesses to NKT Cables, completed in March.

During the fourth quarter, actions were taken across three divisions to complete the business model change for EPC. In the Power Grids division, consistent with ABB's shift in focus away from non-core EPC activities, ABB signed an agreement to form a joint venture with SNC-Lavalin for electrical substation EPC projects; SNC-Lavalin is expected to have a majority interest. In the Industrial Automation division, ABB completed the formation of an oil & gas EPC joint venture with Arkad Engineering and Construction Ltd., a fully integrated EPC contractor for the energy sector based in Saudi Arabia. In the Robotics and Motion division, ABB announced its exit from the turnkey full train retrofit business, once its current contractual commitments are met. The remaining EPC business activities will be reported within a new non-core operating unit, within Corporate and Other, effective January 1, 2018.

Relentless execution

In 2017, ABB continued to drive the streamlining and strengthening of its operations. At the end of 2017, ABB concluded its strategic 1,000-day programs. By the end of 2017, the White Collar Productivity program produced an annual run-rate of approximately \$1.4 billion of gross savings. In addition, as part of the Net Working Capital program, improvements freed up approximately \$1.5 billion of cash since the end of 2014, of which approximately \$600 million was generated during 2017.

Business-led collaboration

ABB has taken the steps necessary to complete its transition to a simpler, leaner and more customer-focused business, while at the same time, linking executive compensation firmly to performance and delivery of strategy.

A focus on leadership development remains key to ensuring ABB's leadership is fully empowered to meet the ABB's growth agenda along with the alignment of all activities under the unified and strengthened ABB brand.

Next Level strategy – stage 3

In October 2016, ABB launched stage 3 of its Next Level strategy to unlock additional value for shareholders and customers. Building on the focus areas of profitable growth, relentless execution and business-led collaboration, stage 3 consists of four actions:

Driving growth in four market-leading entrepreneurial units

We are driving growth in four market-leading entrepreneurial divisions: Electrification Products, Robotics and Motion, Industrial Automation and Power Grids. The new division structure was effective January 1, 2017.

A quantum leap in digital with ABB Ability™

The ABB Ability™ offering combines our portfolio of digital solutions and services across all customer segments, supporting our position as a leader in the Fourth Industrial Revolution and supporting the competitiveness of our four divisions. With ABB Ability™, we estimate an annual addressable market opportunity of up to \$20 billion.

Accelerating momentum in operational excellence

The White Collar Productivity program was completed at the end of 2017. The program achieved an annual run-rate of approximately \$1.4 billion in savings. We also are continuing our regular cost-savings programs aimed at saving the equivalent of 3-5 percent of cost of sales each year.

In 2017, we continued to deliver on our Net Working Capital program, freeing up a total of \$1.5 billion of cash since 2014, of which \$600 million was during 2017. Working capital management has improved across all divisions and regions since the program was launched in 2014.

Strengthening ABB's brand

We are adopting a single corporate brand, consolidating all our brands around the world under one umbrella. Our portfolio of companies is being unified, showcasing the full breadth and depth of our global offering under one master brand. The unified brand plays a key part in realizing the value potential of our digital offering, as we expect it will increase brand loyalty, price premiums and purchase probability.

Capital allocation

The Board of Directors is proposing a ninth consecutive increase in the dividend to 0.78 Swiss francs per share at the 2018 Annual General Meeting.

ABB's capital allocation priorities remain unchanged:

- funding organic growth, research and development, and capital expenditures at attractive cash returns,

- paying a steadily rising, sustainable dividend,
- investing in value-creating acquisitions, and
- returning additional cash to shareholders.

Outlook

While uncertainties prevail, macroeconomic signs are trending positively in Europe and the United States, with growth expected to continue in China. The overall global market shows modest growth and is impacted by geopolitical tensions in various parts of the world. Oil prices and foreign exchange translation effects are expected to continue to influence ABB's results.

The attractive long-term demand outlook in our three major customer sectors — utilities, industry and transport & infrastructure — is driven by the Energy and Fourth Industrial Revolutions.

We believe we are well positioned to tap into these opportunities for long-term profitable growth with our strong market presence, broad geographic and business scope, technology leadership and financial strength.

APPLICATION OF CRITICAL ACCOUNTING POLICIES

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, including, but not limited to, those related to: gross profit margins on long-term construction-type contracts; costs of product guarantees and warranties; provisions for bad debts; recoverability of inventories, investments, fixed assets, goodwill and other intangible assets; the fair values of assets and liabilities assumed in business combinations; income tax expenses and provisions related to uncertain tax positions; pensions and other postretirement benefit assumptions; and legal and other contingencies. 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 difficult and subjective judgments, often as a result of the need to make estimates regarding matters that are inherently uncertain. These policies should be considered when reading our Consolidated Financial Statements.

Revenue recognition

We generally recognize revenues for the sale of goods when persuasive evidence of an arrangement exists, delivery has occurred, the price is fixed or determinable, and collectability is reasonably assured. With regard to the sale of products, delivery is not considered to have occurred, and therefore no revenues are recognized, until the customer 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. We use various International Commercial shipping terms (as promulgated by the International Chamber of Commerce) such as Ex Works (EXW), Free Carrier (FCA) and Delivered Duty Paid (DDP). Subsequent to delivery of the products, we generally have no further contractual performance obligations that would preclude revenue recognition.

Revenues under long-term construction-type contracts are generally recognized using the percentage-of-completion method of accounting. We use 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 management's best estimate of total estimated costs, which are reviewed and updated routinely for contracts in progress. The cumulative effect of any change in estimate is recorded in the period in which the change in estimate is determined.

The percentage-of-completion method of accounting involves the use of assumptions and projections, principally relating to future material, labor and project-related overhead costs. As a consequence, there is a risk that total contract costs will exceed those we originally estimated and the margin will decrease or the long-term construction-type 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 long-term 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.

Short-term construction-type contracts, or long-term construction-type contracts for which reasonably dependable estimates cannot be made or for which inherent hazards make estimates difficult, are accounted for under the completed-contract method. Revenues under the completed-contract method are recognized upon substantial completion—that is: acceptance by the customer, compliance with performance specifications demonstrated in a factory acceptance test or similar event.

For non construction-type contracts that contain customer acceptance provisions, revenue is deferred until customer acceptance occurs or we have demonstrated the customer-specified objective criteria have been met or the contractual acceptance period has lapsed.

Revenues from service transactions are recognized as services are performed. For long-term service contracts, revenues are recognized on a straight-line basis over the term of the contract or, if the performance pattern is other than straight-line, as the services are provided. Service revenues reflect revenues earned from our 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, field service activities that include personnel and accompanying spare parts, and installation and commissioning of products as a stand-alone service or as part of a service contract.

Revenues for software license fees are recognized when persuasive evidence of a non-cancelable license agreement exists, delivery has occurred, the license fee is fixed or determinable, and collection is probable. In software arrangements that include rights to multiple software products and/or services, the total arrangement fee is allocated using the residual method, under which revenue is allocated to the undelivered elements based on vendor-specific objective evidence (VSOE) of fair value of such undelivered elements and the residual amounts of revenue are allocated to the delivered elements. Elements included in multiple element arrangements may consist of software licenses, maintenance (which includes customer support services and unspecified upgrades), hosting, and consulting services. VSOE is based on the price generally charged when an element is sold separately or, in the case of an element not yet sold separately, the price established by authorized management, if it is probable that the price, once established, will not change once the element is sold separately. If VSOE does not exist for an undelivered element, the total arrangement fee will be recognized as revenue over the life of the contract or upon delivery of the undelivered element.

We offer multiple element arrangements to meet our 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. Deliverables of such multiple element arrangements are evaluated to determine the unit of accounting and if certain criteria are met, we allocate revenues to each unit of accounting based on its relative selling price. A hierarchy of selling prices is used to determine the selling price of each specific deliverable that includes VSOE (if available), third-party evidence (if VSOE is not available), or estimated selling price if neither of the first two is available. The estimated selling price reflects our best estimate of what the selling prices of elements would be if the elements were sold on a stand-alone basis. Revenue is allocated between the elements of an arrangement consideration at the inception of the arrangement. Such arrangements generally include industry-specific performance and termination provisions, such as in the event of substantial delays or non-delivery.

Revenues are reported net of customer rebates and similar incentives. Taxes assessed by a governmental authority that are directly imposed on revenue-producing transactions between us and our customers, such as sales, use, value-added and some excise taxes, are excluded from revenues.

These revenue recognition methods require the collectability of the revenues recognized to be reasonably assured. When recording the respective accounts receivable, allowances are calculated to estimate those receivables that will not be collected. These reserves assume a level of default based on historical information, as well as knowledge about specific invoices and customers. The risk remains that actual defaults will vary in number and amount from those originally estimated. As such, the amount of revenues recognized might exceed or fall below the amount which will be collected, resulting in a change in earnings in the future. The risk of deterioration is likely to increase during periods of significant negative industry, economic or political trends.

As a result of the above policies, judgment in the selection and application of revenue recognition methods must be made.

Contingencies

As more fully described in "Item 8. Financial Information—Legal Proceedings" and in "Note 15 Commitments and contingencies" to our Consolidated Financial Statements, we are 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. We are 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.

We record provisions for our 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 our best estimate of the amount of loss or at the lower end of an estimated range when a single best estimate is not determinable. In some cases, we may be able to recover a portion of the costs relating to these obligations from insurers or other third parties; however, we record such amounts only when it is probable that they will be collected.

We provide for anticipated costs for warranties when we recognize revenues on the related products or contracts. Warranty costs include calculated costs arising from imperfections in design, material and workmanship in our products. We generally make 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. There is a risk that actual warranty costs may exceed the amounts provided for, which would result in a deterioration of earnings in the future when these actual costs are determined.

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 \$427 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 \$401 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 2017 by \$24 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. At December 31, 2017, our defined benefit pension plans were \$1,413 million underfunded compared to an underfunding of \$1,403 million at December 31, 2016. Our other postretirement plans were underfunded by \$132 million and \$147 million at December 31, 2017 and 2016, respectively.

We have multiple non-pension postretirement benefit plans. Our health care plans are generally contributory with participants’ contributions adjusted annually. For purposes of estimating our health care costs, we have assumed health care cost increases to be 7.1 percent per annum for 2018, gradually declining to 5.0 percent per annum by 2028 and to remain at that level thereafter.

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 “Provision for taxes” in the Consolidated Income Statements unless the change relates to discontinued operations, in which case the change is recorded in “Income (loss) from discontinued operations, net of tax”. Unforeseen changes in tax rates and tax laws, as well as differences in the projected taxable income as compared to the actual taxable income, may affect these estimates.

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

Business combinations

The amount of goodwill initially recognized in a business combination is based on the excess of the purchase price of the acquired company over the fair value of the assets acquired and liabilities assumed. The determination of these fair values requires us to make significant estimates and assumptions. For instance, when assumptions with respect to the timing and amount of future revenues and expenses associated with an asset are used to determine its fair value, but the actual timing and amount differ materially, the asset could become impaired. In some cases, particularly for large acquisitions, we may engage independent third-party appraisal firms to assist in determining the fair values.

Critical estimates in valuing certain intangible assets include but are not limited to: future expected cash flows of the acquired business, brand awareness, customer retention, technology obsolescence and discount rates.

In addition, uncertain tax positions and tax-related valuation allowances assumed in connection with a business combination are initially estimated at the acquisition date. We reevaluate these items quarterly, based upon facts and circumstances that existed at the acquisition date with any adjustments to our preliminary estimates being recorded to goodwill provided that we are within the twelve-month measurement period. Subsequent to the measurement period or our final determination of the tax allowance's or contingency's estimated value, whichever comes first, changes to these uncertain tax positions and tax-related valuation allowances will affect our provision for income taxes in our Consolidated Income Statements and could have a material impact on our results of operations and financial position. The fair values assigned to the intangible assets acquired are described in "Note 3 Acquisitions and business divestments" as well as "Note 11 Goodwill and other intangible assets", to our Consolidated Financial Statements.

Goodwill and other 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. As of January 1, 2017, we early adopted an accounting standard update eliminating the requirement to calculate the implied fair value of goodwill when calculating an impairment loss.

We use either a qualitative or quantitative assessment method for each reporting unit. The qualitative assessment involves determining, based on an evaluation of qualitative factors, whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. 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, then a quantitative impairment test is performed. If we elect not to perform the qualitative assessment for a reporting unit, then we perform the quantitative impairment test.

Our reporting units are the same as our business divisions for Electrification Products, Robotics and Motion, and Power Grids. For the Industrial Automation division, we determined the reporting units to be one level below the division, as the different products produced or services provided by this division do not share sufficiently similar economic characteristics to permit testing of goodwill on a total division level.

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 value of the reporting unit include the projected level of business operations, the weighted-average cost of capital, the income tax rate and the terminal growth rate.

If, after performing the qualitative assessment, we conclude that events or circumstances have occurred which would indicate that it is more likely than not that the fair value of the reporting unit is less than its carrying value, or if we have elected not to perform a qualitative assessment, then a quantitative impairment test is performed. First, we calculate the fair value of the reporting unit (using an income approach whereby the fair value is calculated based on the present value of future cash flows applying a discount rate that represents our weighted-average cost of capital) and compare it to the reporting unit's carrying value. Where the fair value of the reporting unit exceeds the carrying value of the net assets assigned to that unit, goodwill is not impaired and no further testing is performed. However, if the carrying value of the net assets assigned to the reporting unit is equal to or exceeds the reporting unit's fair value, we would record an impairment loss equal to the difference, up to the full amount of goodwill. Any goodwill impairment losses would be recorded as a separate line item in the income statement in continuing operations, unless related to a discontinued operation, in which case the losses would be recorded in "Income (loss) from discontinued operations, net of tax".

In 2017, we performed a qualitative assessment 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.

In 2016, prior to the adoption of the new accounting standard update, we performed the two-step quantitative impairment test for all of our reporting units to reflect new assumptions and forecasts resulting from our newly developed strategic plan for the period 2017 to 2020. The two-step test required us to first calculate the fair value of the reporting unit and then compare it to the reporting unit's carrying value (as described above). However, if the carrying value of the net assets assigned to the reporting unit was equal to or exceeded the reporting unit's fair value, we would have performed a second step whereby we would have determined the implied fair value of the reporting unit's goodwill and would have compared it to the carrying value of the reporting unit's goodwill. If the carrying value of a reporting unit's goodwill had exceeded its implied fair value, then we would have recorded an impairment loss equal to the difference.

The quantitative test performed in 2016, concluded that the estimated fair values for each of our reporting units exceeded their respective carrying values by more than 100 percent and as no reporting unit had a zero or negative carrying value, we concluded that none of the reporting units were "at risk" of failing the goodwill impairment test. Consequently, the second step of the impairment test was not performed.

The projected future cash flows used in the 2016 fair value calculation were based on approved business plans for the reporting units which covered a period of four years plus a calculated terminal value. The projected future cash flows required significant judgments and estimates involving variables such as future sales volumes, sales prices, awards of large orders, production and other operating costs, capital expenditures, net working capital requirements and other economic factors. The after-tax weighted-average cost of capital of 8 percent was based on variables such as the risk-free rate derived from the yield of 10-year U.S. treasury bonds as well as an ABB-specific risk premium. The terminal value growth rate was assumed to be 1 percent. The mid-term tax rate used in the test was 27 percent. We based our fair value estimates on assumptions we believed to be reasonable, but which were inherently uncertain. Consequently, actual future results may differ from those estimates.

We assessed the reasonableness of the fair value calculations of our reporting units by reconciling the sum of the fair values for all our reporting units to our total market capitalization. The assumptions used in the fair value calculation were challenged each year (through the use of sensitivity analysis) to determine the impact on the fair value of the reporting units. Our sensitivity analysis in 2016 showed that, holding all other assumptions constant, a 1-percentage point increase in the discount rate would have reduced the calculated fair value by approximately 12.9 percent, while a 1-percentage point decrease in the terminal value growth rate would have reduced the calculated fair value by approximately 9.7 percent.

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 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 (loss) from discontinued operations, net of tax".

NEW ACCOUNTING PRONOUNCEMENTS

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

RESEARCH AND DEVELOPMENT

Each year, we invest significantly in research and development. Our research and development focuses on developing and commercializing the technologies of our businesses that are of strategic importance to our future growth. In 2017, 2016 and 2015, we invested \$1,365 million, \$1,300 million and \$1,406 million, respectively, or approximately 4.0 percent, 3.8 percent and 4.0 percent, respectively, of our annual consolidated revenues on research and development activities. We also had expenditures of \$131 million, \$155 million and \$271 million, respectively, or approximately 0.4 percent, 0.5 percent and 0.8 percent, respectively, of our annual consolidated revenues in 2017, 2016 and 2015, 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. Order-related development amounts are initially recorded in inventories as part of the work in process of a contract and then are reflected in cost of sales at the time revenue is recognized in accordance with our accounting policies.

In addition to continuous product development, and order-related engineering work, we develop platforms for technology applications in our automation and power 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.

Universities are incubators of future technology, and a central task of our research and development team is to transform university research into industry-ready technology platforms. We collaborate with a number of 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 recruit and train new personnel. We have built numerous university collaborations in the U.S., Europe and Asia, including long-term, strategic relationships with the Carnegie Mellon University, Massachusetts Institute of Technology, ETH Zurich, Royal Institute of Technology (KTH) Stockholm, Chalmers University of Technology Gothenburg, Cambridge University, Imperial College London, Dresden University of Technology and Xi'an Jiaotong University (XJTU). Our collaborative projects include research on materials, sensors, micro-engineered mechanical systems, robotics, controls, manufacturing, distributed power and communication. Common platforms for power and automation technologies are developed around advanced materials, efficient manufacturing, information technology and data communication, as well as sensor and actuator technology.

Common applications of basic power and automation technologies can also be found in power electronics, electrical insulation, and control and optimization. Our power technologies, including our insulation technologies, current interruption and limitation devices, power electronics, flow control and power protection processes, apply as much to large, reliable, blackout-free transmission systems as they do to everyday household needs. Our automation technologies, including our control and optimization processes, power electronics, sensors and microelectronics, mechatronics and wireless communication processes, are designed to improve efficiency in plants and factories around the world, including our own.

ACQUISITIONS AND DIVESTMENTS

Acquisitions

During 2017, 2016 and 2015, ABB paid \$2,111 million, \$13 million and \$37 million to purchase five, one and three businesses, respectively. The amounts exclude increases in investments made in cost- and equity-accounted companies.

The principal acquisition in 2017 was B&R, which was acquired in July. B&R is a worldwide provider of product- and software-based, open-architecture solutions for machine and factory automation and employs more than 3,000 people, including about 1,000 research and development, and application engineers. It operates across 70 countries in the machine and factory automation market segment.

None of the acquisitions in 2016 or 2015 were significant.

Planned acquisition of GE Industrial Solutions

On September 25, 2017, the Company announced that it had reached an agreement to acquire GE IS, GE's global electrification solutions business, for \$2.6 billion. The acquisition is expected to strengthen the Company's global position in electrification and expand its access to the North American market through strong customer relationships, a large installed base and extensive distribution networks. GE IS is headquartered in the United States and has approximately 13,500 employees. The Company expects to complete the acquisition in the first half of 2018, following the receipt of customary regulatory approvals.

Divestments and Assets held for sale

In September 2016, ABB announced an agreement to divest its high-voltage cable system business. The assets and liabilities of this business are shown as assets and liabilities held for sale in our Consolidated Balance Sheet at December 31, 2016. The divestment was completed on March 1, 2017. Total cash proceeds from all business divestments during 2017 amounted to \$605 million, net of transaction costs and cash disposed.

There were no significant divestments in 2016 and 2015.

For more information on our acquisitions and divestments, see “Note 3 Acquisitions and business divestments” 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 both the EUR 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 and the USD and the CHF at December 31, 2017, 2016 and 2015, were as follows:

Exchange rates into \$	2017	2016	2015
EUR 1.00	1.20	1.05	1.09
CHF 1.00	1.02	0.98	1.01

The average exchange rates between the USD and the EUR and the USD and the CHF for the years ended December 31, 2017, 2016 and 2015, were as follows:

Exchange rates into \$	2017	2016	2015
EUR 1.00	1.13	1.10	1.11
CHF 1.00	1.02	1.01	1.04

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 2017, approximately 80 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 20 percent,
- Chinese renminbi, approximately 13 percent, and
- Swedish krona, approximately 6 percent.

In 2017, approximately 79 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 20 percent,
- Chinese renminbi, approximately 12 percent, and
- Swedish krona, approximately 5 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 many of our subsidiaries outside of the United States are reported 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 revenues we expect to generate from our orders at any point in time is represented by our order backlog. Approximately 8.5 percent of the value of total orders we recorded in 2017 were “large orders”, which we define as orders from third parties involving a value of at least \$15 million for products or services. Approximately 61 percent of the total value of large orders in 2017 were recorded in our Power Grids division and approximately 22 percent in our Industrial Automation division. The other divisions accounted for the remainder of the total large orders recorded during 2017. The remaining portion of total orders recorded in 2017 was “base orders”, which we define as orders from third parties with a value of less than \$15 million for products or services.

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 large orders result in revenues in periods after the order is booked. Consequently, the level of large orders and orders generally cannot be used to accurately predict future revenues or operating performance. Orders that have been placed can 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 divisions 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 and restructuring-related expenses,
- non-operational pension cost comprising: (a) interest cost, (b) expected return on plan assets, (c) amortization of prior service cost (credit), (d) amortization of net actuarial loss, and (e) curtailments, settlements and special termination benefits,
- changes in the amount recorded for retained obligations of divested businesses occurring after the divestment date (changes in retained obligations of 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,
- acquisition-related expenses and certain 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).

See “Note 23 Operating segment and geographic data” to our Consolidated Financial Statements for a reconciliation of the total consolidated 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 \$)	2017	2016	2015
Orders	33,387	33,379	36,429
Order backlog at December 31,	22,414	22,981	24,121
Revenues	34,312	33,828	35,481
Cost of sales	(24,046)	(24,081)	(25,347)
Gross profit	10,266	9,747	10,134
Selling, general and administrative expenses	(5,607)	(5,349)	(5,574)
Non-order related research and development expenses	(1,365)	(1,300)	(1,406)
Other income (expense), net	140	(111)	(105)
Income from operations	3,434	2,987	3,049
Net interest and other finance expense	(203)	(188)	(209)
Provision for taxes	(860)	(781)	(788)
Income from continuing operations, net of tax	2,371	2,018	2,052
Income (loss) from discontinued operations, net of tax	(6)	16	3
Net income	2,365	2,034	2,055
Net income attributable to noncontrolling interests	(152)	(135)	(122)
Net income attributable to ABB	2,213	1,899	1,933
<i>Amounts attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	2,219	1,883	1,930
Net income	2,213	1,899	1,933
<i>Basic earnings per share attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	1.04	0.88	0.87
Net income	1.04	0.88	0.87
<i>Diluted earnings per share attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	1.03	0.87	0.87
Net income	1.03	0.88	0.87

A more detailed discussion of the orders, revenues, Operational EBITA and income from operations for our divisions follows in the sections of “Divisional analysis” below entitled “Electrification Products”, “Robotics and Motion”, “Industrial Automation”, “Power Grids” and “Corporate and Other”. Orders and revenues of our divisions include interdivisional transactions which are eliminated in the “Corporate and Other” line in the tables below.

Orders

(\$ in millions)	2017	2016	2015	% Change	
				2017	2016
Electrification Products	10,143	9,780	10,610	4%	(8)%
Robotics and Motion	8,468	7,858	8,272	8%	(5)%
Industrial Automation	6,554	5,991	7,398	9%	(19)%
Power Grids	9,600	10,844	11,425	(11)%	(5)%
Operating divisions	34,765	34,473	37,705	1%	(9)%
Corporate and Other ⁽¹⁾	(1,378)	(1,094)	(1,276)	n.a.	n.a.
Total	33,387	33,379	36,429	0%	(8)%

(1) Includes interdivisional eliminations

In 2017, total orders were flat (flat in local currencies). The increase in orders in the Industrial Automation division mainly reflects the B&R acquisition in July 2017 as well as the increase in demand for ABB Ability™ solutions. A recovery in the end-market demand contributed to the increase in orders for the Electrification Products division. In the Robotics and Motion division demand was supported by strong orders in the Robotics business. The decrease in orders in the Power Grids division mainly reflects lower large orders compared to 2016 which included significant orders from India and China for ultrahigh-voltage direct current (UHVDC) transmission projects.

In 2017, base orders increased 6 percent (6 percent in local currencies) with positive impacts across all divisions. The increase in base orders reflects improvements in the global economic conditions across our key markets. Large orders decreased 37 percent (36 percent in local currencies), partly reflecting ABB's business model shift but also reflecting the impact of the large UHVDC orders in 2016 from India and China referred to above. For additional information about divisional order performance in all periods, please refer to the relevant sections of "Divisional analysis" below.

In 2016, total orders declined 8 percent (5 percent in local currencies) with orders decreasing in all divisions. The decline reflects ongoing macro-economic and geopolitical uncertainties and challenges in many markets. The low demand from both the onshore and offshore oil segments negatively impacted many businesses, particularly the Industrial Automation division. This also contributed to the negative order development in the Robotics and Motion division, despite the strong demand from various industries for robotics. Weak market conditions impacted the orders in the Electrification Products and in the Power Grids divisions.

In 2016, base orders declined 5 percent (2 percent in local currencies) with negative impacts across all divisions. The decline of base orders reflects the uncertain global economic conditions across our key markets. Large orders decreased 27 percent (25 percent in local currencies), impacted by considerable investment delays.

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)	2017	2016	2015	% Change	
				2017	2016
Europe	11,737	11,213	12,568	5%	(11)%
The Americas	9,749	9,351	10,505	4%	(11)%
Asia, Middle East and Africa	11,901	12,815	13,356	(7)%	(4)%
Total	33,387	33,379	36,429	0%	(8)%

Orders in 2017 increased in Europe and the Americas but were lower in Asia, Middle East and Africa, mainly due to the booking in 2016 of the large UHVDC orders in India and China referred to above. Both the Electrification Products and Robotics and Motion divisions saw growth in all regions while the Power Grids division saw declines in Asia, Middle East and Africa. Orders in Europe increased 5 percent (4 percent in local currencies) due primarily to an increase in base orders compared to 2016. Orders in Europe for the Electrification Products, Industrial Automation and Power Grids divisions grew in local currencies while remained flat for the Robotics and Motion division. In local currencies, orders were lower in Germany, Italy, Norway and Switzerland while orders increased in the United Kingdom, France and Spain. In the Americas orders increased 4 percent (3 percent in local currencies). In local currencies, orders increased in the U.S. and Canada. In Asia, Middle East and Africa, orders decreased 7 percent (6 percent in local currencies) as higher base orders were offset by lower large orders. Orders in China, India and Saudi Arabia decreased while orders increased in South Korea and the United Arab Emirates in local currencies.

Orders in 2016 declined in all regions, although we achieved growth within some divisions in Europe and Asia, Middle East and Africa. Orders in Europe decreased 11 percent (9 percent in local currencies) due primarily to lower large orders compared to 2015. Orders in Europe for the Electrification Products and the Robotics and Motion divisions grew in local currencies but were offset by decreases in the other divisions. In local currencies, orders were lower in Germany, the United Kingdom, Norway, Switzerland, Russia, France, Finland, Turkey and the Netherlands while orders increased in Italy, Sweden and Spain. In the Americas orders declined 11 percent (9 percent in local currencies) on lower base and large orders. In local currencies, orders decreased in the U.S. (mainly due to lower large orders), Canada, Brazil, Chile and Argentina while orders increased in Mexico. In Asia, Middle East and Africa, orders decreased 4 percent (flat in local currencies) as lower base orders were offset by strong demand for our power offering and higher large orders. Orders in China and India increased mainly due to investment activities in the HVDC power transmission technology while orders declined in Saudi Arabia, South Korea, the United Arab Emirates, Australia, Japan, South Africa and Qatar.

Order backlog

(\$ in millions)	December 31,			% Change	
	2017	2016	2015	2017	2016
Electrification Products	3,098	2,839	3,136	9%	(9)%
Robotics and Motion	3,961	3,660	3,785	8%	(3)%
Industrial Automation	5,376	5,409	6,199	(1)%	(13)%
Power Grids	11,330	11,638	11,707	(3)%	(1)%
Operating divisions	23,765	23,546	24,827	1%	(5)%
Corporate and Other ⁽¹⁾	(1,351)	(565)	(706)	n.a.	n.a.
Total	22,414	22,981	24,121	(2)%	(5)%

(1) Includes interdivisional eliminations

As at December 31, 2017, the consolidated order backlog declined 2 percent (8 percent in local currencies). Order backlog declined in the Industrial Automation and Power Grids divisions while increased in the Electrification Products as well as in the Robotics and Motion divisions. The decrease in the order backlog was mainly due to high levels of execution from the order backlog while orders received during the year remained flat compared to 2016. The net impact on order backlog from divestments and acquisitions was a decrease of 4 percent.

As at December 31, 2016, the consolidated order backlog declined 5 percent (2 percent in local currencies) and was lower in all divisions. The decline in the Electrification Products division was driven by the Medium Voltage Products and Building Products businesses. In the Robotics and Motion division, the backlog was flat in local currencies as the increase in the Robotics was offset by declines in the other businesses. In the Industrial Automation division, order backlog declined and was lower across all businesses, except for in the Measurement and Analytics business. In the Power Grids division, local currency order backlog increased, driven by the Transformers business.

Revenues

(\$ in millions)	2017	2016	2015	% Change	
				2017	2016
Electrification Products	10,094	9,920	10,275	2%	(3)%
Robotics and Motion	8,401	7,906	8,188	6%	(3)%
Industrial Automation	6,880	6,654	7,219	3%	(8)%
Power Grids	10,394	10,660	11,245	(2)%	(5)%
Operating divisions	35,769	35,140	36,927	2%	(5)%
Corporate and Other ⁽¹⁾	(1,457)	(1,312)	(1,446)	n.a.	n.a.
Total	34,312	33,828	35,481	1%	(5)%

(1) Includes interdivisional eliminations

Revenues in 2017 increased 1 percent (1 percent in local currencies) as growth in 2017 was generally hindered by a lower opening order backlog compared to 2016. Revenues in the Robotics and Motion division were positively impacted by growth in the Robotics business with strong demand from the automotive and general industry sectors. The increase in revenues in the Industrial Automation division was mainly attributable to the acquisition of B&R in July 2017, partially offset by lower revenues in the division's other businesses. Revenues in the Electrification Products division increased from both the distributors as well as certain end-customer channels. Revenues in the Power Grids division were impacted by weaker large order intake as well as a lower opening order backlog. For additional information about the divisional revenues performance in all periods, please refer to "Divisional analysis" below.

Revenues in 2016, decreased 5 percent (2 percent in local currencies) and declined in all divisions. Revenues were lower due to declining orders during the year and a lower opening order backlog compared to the beginning of 2015. In the Industrial Automation division, a continued low level of orders from the oil and gas industry, as well as from mining and metals, negatively impacted revenues. Revenues in the Power Grids division were impacted by weaker order intake, the exit from certain businesses as well as lower pull-through revenues from other divisions. Revenues were positively impacted by growth in the Robotics business, despite market challenges while revenues in the Electrification Products division slightly increased in local currencies.

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)	2017	2016	2015	% Change	
				2017	2016
Europe	11,840	11,315	11,602	5%	(2)%
The Americas	9,713	9,741	10,554	0%	(8)%
Asia, Middle East and Africa	12,759	12,772	13,325	0%	(4)%
Total	34,312	33,828	35,481	1%	(5)%

In 2017, revenues increased in Europe but were flat in the Americas and in Asia, Middle East and Africa. In Europe, revenues increased 5 percent (4 percent in local currencies) reflecting growth in the Electrification Products and Power Grids divisions, as well as in the Industrial Automation division, which benefited from the acquisition of B&R. In local currencies, revenues declined in Germany and the United Kingdom, while revenues increased in France, Italy, Norway and Sweden. Revenues in the Americas were flat (decreased 1 percent in local currencies). In local currencies, revenues decreased in Brazil, Canada, Chile and Peru while revenues were higher in the U.S. In Asia, Middle East and Africa, revenues were flat (flat in local currencies). In local currencies, revenues declined in Australia, Japan, Saudi Arabia, South Korea and Singapore while revenues increased in China and India.

In 2016, revenues decreased across all regions, although we achieved regional growth within some divisions. In Europe, revenues declined 2 percent (flat in local currencies) due to growth in the Electrification Products division and steady revenues in the Industrial Automation division. In local currencies, revenues declined in Sweden, Norway, Switzerland, Germany and France, while revenues increased in Russia, the United Kingdom, Italy and Spain. Revenues from the Americas decreased 8 percent (5 percent in local currencies). In local currencies, revenues decreased in the U.S. and Brazil while revenues were higher in Canada, Mexico, Argentina and Chile. In Asia, Middle East and Africa, revenues decreased 4 percent (1 percent in local currencies), supported by strong demand for our power offering. In local currencies, revenues declined in South Africa, Australia, Japan, Saudi Arabia and Singapore while revenues increased in China, India and Egypt.

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 2017, cost of sales was flat (flat in local currencies) at \$24,046 million. The Robotics and Motion division recorded the highest increase in cost of sales, which was due to revenue growth but also due to additional charges recorded in the turnkey full train retrofit business. As a percentage of revenues, cost of sales decreased from 71.2 percent in 2016 to 70.1 percent in 2017. The decrease in the cost of sales as a percentage of revenues occurred in all divisions except Robotics and Motion, and was impacted by the reversal in 2017 of previously recorded restructuring costs. Total restructuring costs in cost of sales, net of reversals, was \$88 million in 2017 compared to \$182 million in 2016. In addition, cost of sales continued to reflect improvements generated from supply chain programs aimed at reducing costs.

In 2016, cost of sales decreased 5 percent (2 percent in local currencies) to \$24,081 million. As a percentage of revenues, cost of sales decreased from 71.4 percent in 2015 to 71.2 percent in 2016. In particular, the Industrial Automation and Power Grids divisions had a reduction in cost of sales as a percentage of revenues, resulting from improvement in project margins and savings from supply chain and operational excellence cost take-out programs. In 2016, cost of sales was negatively impacted by approximately 0.5 percent due to the charges recorded for a change in previously estimated warranty liabilities for certain solar inverters sold by Power-One in the Electrification Products division.

Selling, general and administrative expenses

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

(\$ in millions, unless otherwise stated)	2017	2016	2015
Selling expenses	3,585	3,480	3,729
<i>Selling expenses as a percentage of orders received</i>	<i>10.7%</i>	<i>10.4%</i>	<i>10.2%</i>
General and administrative expenses	2,022	1,869	1,845
<i>General and administrative expenses as a percentage of revenues</i>	<i>5.9%</i>	<i>5.5%</i>	<i>5.2%</i>
Total selling, general and administrative expenses	5,607	5,349	5,574
<i>Total selling, general and administrative expenses as a percentage of revenues</i>	<i>16.3%</i>	<i>15.8%</i>	<i>15.7%</i>
<i>Total selling, general and administrative expenses as a percentage of the average of orders received and revenues</i>	<i>16.6%</i>	<i>15.9%</i>	<i>15.5%</i>

In 2017, general and administrative expenses increased 8 percent compared to 2016 (8 percent in local currencies). As a percentage of revenues, general and administrative expenses increased from 5.5 percent to 5.9 percent. Although we recorded a reduction of \$55 million in restructuring and restructuring-related expenses for the White Collar Productivity program compared to last year, general and administrative expenses increased driven by a series of strategic investments including the Power Up program and additional general and administrative expenses from the acquired B&R.

In 2016, general and administrative expenses increased 1 percent compared to 2015 (4 percent in local currencies). As a percentage of revenues, general and administrative expenses increased from 5.2 percent to 5.5 percent. General and administrative expenses were impacted by approximately \$183 million of restructuring and restructuring-related expenses for the White Collar Productivity program. Restructuring-related expenses include the additional costs of running parallel operations during the relocation and transition phase, advisory costs for external consultants, expenses associated with our internal restructuring program implementation teams and costs for hiring and training personnel at new locations.

In 2017, selling expenses increased 3 percent compared to 2016 (2 percent in local currencies) primarily driven by extended sales activities in selective business units like Robotics, Grid Integration, Building Products and Grid Automation and additional selling expenses from the acquired B&R, despite a reduction of \$32 million in expenses for the White Collar Productivity program. Selling expenses as a percentage of orders received increased from 10.4 percent to 10.7 percent on higher expenses.

In 2016, selling expenses decreased 7 percent compared to 2015 (4 percent in local currencies) primarily driven by lower restructuring expenses related to the White Collar Productivity program. Selling expenses as a percentage of orders received increased from 10.2 percent to 10.4 percent on lower orders. Selling expenses were impacted by approximately \$34 million from costs for the White Collar Productivity program.

In 2017, selling, general and administrative expenses increased 5 percent compared to 2016 (4 percent in local currencies) and as a percentage of the average of orders and revenues, selling, general and administrative expenses increased from 15.9 percent to 16.6 percent mainly from the impact of the higher expenses described above.

In 2016, selling, general and administrative expenses decreased 4 percent compared to 2015 (2 percent in local currencies) and as a percentage of the average of orders and revenues, selling, general and administrative expenses increased from 15.5 percent to 15.9 percent mainly impacted by lower orders and revenues.

Non-order related research and development expenses

In 2017, non-order related research and development expenses increased 5 percent (5 percent in local currencies) compared to 2016 reflecting a focused increase in investment to build up competencies in certain new technologies. In 2016, non-order related research and development expenses decreased 8 percent (6 percent in local currencies) compared to 2015 and reflects the savings realized by reducing the number of employees.

Non-order related research and development expenses as a percentage of revenues increased in 2017 to 4.0 percent, after decreasing to 3.8 percent in 2016 from 4.0 percent in 2015.

Other income (expense), net

(\$ in millions)	2017	2016	2015
Restructuring and restructuring-related expenses ⁽¹⁾	(49)	(49)	(67)
Net gain from sale of property, plant and equipment	36	38	26
Asset impairments	(29)	(61)	(33)
Net gain (loss) from sale of businesses	252	(10)	(20)
Misappropriation loss, net	(9)	(73)	—
Income from equity-accounted companies and other income (expense), net	(61)	44	(11)
Total	140	(111)	(105)

(1) Excluding asset impairments

“Other income (expense), net” primarily includes certain restructuring and restructuring-related expenses, gains and losses from sale of businesses and sale of property, plant and equipment, recognized asset impairments, as well as our share of income or loss from equity-accounted companies.

In 2017, “Other income (expense), net” was an income of \$140 million compared to an expense of \$111 million in 2016. The change was mainly due to \$252 million net gains recorded in 2017 from sales of businesses, primarily relating to the Cables business. In 2017, we also recorded higher charges in connection with certain legal claims (recorded within other expense) and lower asset impairments. The change compared to 2016 also reflects that in 2016 we recorded the large misappropriation loss described below.

In 2016, “Other income (expense), net” was an expense of \$111 million compared to an expense of \$105 million in 2015. In 2016, we recorded lower restructuring costs, higher gains on sale of property, plant and equipment, and lower losses from sale of businesses. In addition, higher asset impairments negatively impacted Other income (expense), net in 2016. We also recorded a loss of \$73 million, net of expected insurance recoveries, for the misappropriation of cash by the treasurer of our subsidiary in South Korea, which was uncovered in February 2017. In addition, in 2016, other income included gains on certain foreign currency derivatives entered into in connection with the planned sale of the Cables business.

Income from operations

(\$ in millions)	2017	2016	2015	% Change ⁽¹⁾	
				2017	2016
Electrification Products	1,349	1,091	1,247	24%	(13)%
Robotics and Motion	1,035	1,034	1,058	0%	(2)%
Industrial Automation	782	769	793	2%	(3)%
Power Grids	797	830	554	(4)%	50%
Operating divisions	3,963	3,724	3,652	6%	2%
Corporate and Other	(535)	(741)	(617)	n.a.	n.a.
Intersegment elimination	6	4	14	n.a.	n.a.
Total	3,434	2,987	3,049	15%	(2)%

(1) Certain percentages are stated as n.a. as the computed change would not be meaningful.

In 2017 and 2016, changes in income from operations were a result of the factors discussed above and in the divisional analysis below.

Net interest and other finance expense

Net interest and other finance expense consists of “Interest and dividend income” offset by “Interest and other finance expense”.

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

(\$ in millions)	2017	2016	2015
Interest and dividend income	74	73	77
Interest and other finance expense	(277)	(261)	(286)
Net interest and other finance expense	(203)	(188)	(209)

In 2017, “Interest and other finance expense” increased compared to 2016. Interest expense on issued bonds and other outstanding borrowings was lower than 2016 but was offset by higher interest charges for uncertain tax positions.

In 2016, “Interest and other finance expense” decreased compared to 2015. Interest expense on bonds and other debt was lower and interest charges for uncertain tax positions were lower in 2016 compared to 2015. This was partially offset by higher foreign exchange losses.

Provision for taxes

(\$ in millions)	2017	2016	2015
Income from continuing operations before taxes	3,231	2,799	2,840
Provision for taxes	(860)	(781)	(788)
Effective tax rate for the year	26.6%	27.9%	27.7%

In 2017, the effective tax rate decreased from 27.9 percent to 26.6 percent. The distribution of income within the group resulted in a higher weighted-average global tax rate. In addition, the impact from changes to the interpretation of law and double tax treaty agreements by competent tax authorities increased the effective tax rate. However, these were more than offset primarily by the positive impact from non-taxable amounts for the net gain from sale of businesses and the net benefit from a change in tax rate.

In 2016, the effective tax rate increased to 27.9 percent from 27.7 percent. The distribution of income within the group resulted in a lower weighted-average global tax rate. Changes in the valuation allowance in 2016 compared to 2015 lowered the effective tax rate, as did the impact of the interpretation of tax law and double tax treaty agreements by competent tax authorities. However, these were offset by the negative impacts of changes in enacted tax rates and lower benefits arising from research and development activities.

In 2015, the effective tax rate of 27.7 percent included a net increase in valuation allowance of deferred taxes of \$57 million, as we determined it was not more likely than not that such deferred tax assets would be realized. In addition, we recorded a benefit of \$50 million relating to tax credits arising from research and development activities and a charge of \$74 million relating to the interpretation of tax law and double tax treaty agreements by competent tax authorities.

Income from continuing operations, net of tax

As a result of the factors discussed above, income from continuing operations, net of tax, increased by \$353 million to \$2,371 million in 2017 compared to 2016, and decreased \$34 million to \$2,018 million in 2016 compared to 2015.

Income (loss) from discontinued operations, net of tax

Income (loss) from discontinued operations, net of tax, for 2017, 2016 and 2015, was not significant.

Net income attributable to ABB

As a result of the factors discussed above, net income attributable to ABB increased by \$314 million to \$2,213 million in 2017 compared to 2016, and decreased by \$34 million to \$1,899 million in 2016 compared to 2015.

Earnings per share attributable to ABB shareholders

(in \$)	2017	2016	2015
<i>Income from continuing operations, net of tax:</i>			
Basic	1.04	0.88	0.87
Diluted	1.03	0.87	0.87
<i>Net income attributable to ABB:</i>			
Basic	1.04	0.88	0.87
Diluted	1.03	0.88	0.87

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.

Divisional analysis

Electrification Products

Effective January 1, 2017, the Group reorganized its four business divisions to bring together all businesses relating to electrification of the consumption points. In connection with this change, the scope of the Electrification Products division has been expanded to include the electric vehicle charging, solar and power quality businesses from the former Discrete Automation and Motion division. The financial information for 2016 and 2015 has been recast to reflect these organizational changes.

The financial results of our Electrification Products division were as follows:

(\$ in millions)	2017	2016	2015	% Change	
				2017	2016
Orders	10,143	9,780	10,610	4%	(8)%
Third-party base orders	9,559	9,242	9,758	3%	(5)%
Order backlog at December 31,	3,098	2,839	3,136	9%	(9)%
Revenues	10,094	9,920	10,275	2%	(3)%
Income from operations	1,349	1,091	1,247	24%	(13)%
Operational EBITA	1,510	1,459	1,520	3%	(4)%

Orders

The majority of the division’s orders are small with short delivery times; orders are usually recorded and delivered within a three month period and thus are generally considered as short-cycle. The remainder of orders is comprised of smaller projects that require longer lead times or larger solutions requiring engineering and installation. Substantially all of the division’s orders are comprised of base orders. In addition, approximately half of the division’s orders are received via third-party distributors; as a consequence, end-customer market data is based partially on management estimates.

In 2017, orders increased 4 percent (5 percent in local currencies) with stronger order growth in the second half of the year. Orders for products increased throughout the division as end market demand improved in utilities and construction, specifically non-residential construction. Increased demand for low-voltage and medium-voltage solutions was primarily driven by continued investments in light industries such as data centers as well as food and beverage. Orders in the Power and EV Infrastructure business increased driven by large order intake for electric vehicle products and systems, however the growth was partially offset by decreases in demand for solar products and systems.

In 2016, orders decreased by 8 percent (5 percent in local currencies). Orders were impacted by weak market conditions in the process industries and in particular in the oil and gas sector, as many EPC projects were delayed or cancelled. This negatively affected the Medium Voltage Products and Electrification Solutions businesses. Driven by construction and light industries, demand for our short-cycle products was stable. Product demand was weaker in the Installation Products business, with lower orders from both distributors and end-customer channels. Orders in the Protection and Connection business were lower as growth in OEM orders was offset by weakened orders from end-customer and distributor channels. Orders were higher in the Building Products business, as lower order levels from direct end-customers were more than offset by increased orders through distributors. Finally, orders in the Power and EV Infrastructure business declined, driven by a decrease in orders of customers in the solar industry.

The geographic distribution of orders for our Electrification Products division was as follows:

(in %)	2017	2016	2015
Europe	37	37	34
The Americas	27	27	28
Asia, Middle East and Africa	36	36	38
Total	100	100	100

In 2017, relative order growth was similar in all regions, leading to a stable regional distribution. In Asia, Middle East and Africa, a positive order trend was seen in China, Australia and India. The European market performed well with order growth across the majority of countries including Germany, Turkey and Sweden. Growth in the Americas was mainly supported by the United States and Canada.

In 2016, the share of orders in Europe increased, driven by growth in several countries, especially Germany. In the Americas, the share of orders decreased slightly due to order declines in the region, particularly in the United States and Canada. Asia, Middle East and Africa was relatively weak primarily due to lower orders in China and Saudi Arabia compared to 2015.

Order backlog

In 2017, the order backlog increased 9 percent (5 percent in local currencies), with strong growth in the Power and EV Infrastructure business, where there was significant order intake for electric vehicle fast-charging solutions.

In 2016, the order backlog decreased 9 percent (6 percent in local currencies), primarily because of a decreased backlog in the Medium Voltage Products business, reflecting higher execution levels of orders for Modular Systems and Primary Switchgear. The backlog also decreased due to lower orders received in the Power and EV Infrastructure business.

Revenues

In 2017, revenues increased 2 percent (2 percent in local currencies) compared to 2016. Revenues for the Protection and Connection, Building Products and Installation Products businesses increased, driven by end-market demand in utilities and construction, specifically non-residential construction. Across the division, revenue levels improved both from distributors as well as some end-customer channels. Revenues were lower in the Medium Voltage Products and Power and EV Infrastructure business as the opening order backlog was lower coming into 2017, mainly related to the solar industry.

In 2016, revenues decreased 3 percent (1 percent in local currencies) compared to 2015 and were mixed across the division. In local currencies, revenues increased in the Medium Voltage Products business as sales from Modular Systems more than offset lower volume coming from Primary Switchgear. The Building Products business also increased revenues driven by distribution and panel builder channels, which partially mitigated the lower revenues from direct end-customers. Revenues were lower in all other business units on lower demand from the distribution and OEM channels.

The geographic distribution of revenues for our Electrification Products division was as follows:

(in %)	2017	2016	2015
Europe	37	36	34
The Americas	27	27	27
Asia, Middle East and Africa	36	37	39
Total	100	100	100

In 2017, the share of revenues from Europe increased, supported by positive growth in Germany. The share of revenues from the Americas was stable supported by the United States, which returned to growth. The relative share of revenues from Asia, Middle East and Africa decreased slightly despite China returning to growth and mixed results in the Middle East.

In 2016, the share of revenues from Europe increased. Growth stemmed from several countries, especially Germany. The Americas maintained a stable share of revenues, although in absolute terms revenues decreased slightly. The lowered share of revenues from Asia, Middle East and Africa was driven by a reduced revenue volume from China and the Middle East.

Income from operations

In 2017, income from operations increased 24 percent mainly reflecting significantly lower warranty costs than in 2016 when the division recorded significant costs for a change in estimated warranty liabilities for certain solar inverters designed and sold by Power-One. Restructuring and restructuring-related expenses in 2017 of \$28 million were \$65 million lower than in 2016, partially because we recorded a reversal of the previously recorded estimated restructuring expenses in connection with the White Collar Productivity program. Acquisition-related amortization was lower in 2017 as certain intangibles from previous acquisitions had been fully amortized. During 2017, we also realized higher income due to the impact of price increases in certain businesses and the benefits from savings resulting from ongoing restructuring and cost savings programs. Partially offsetting these benefits was the impact of higher commodity prices, which affected all businesses, as well as the impacts from pricing pressures. Changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, positively impacted income from operations by 3 percent.

In 2016, income from operations decreased 13 percent primarily due to the impact of the significant warranty costs referred to above incurred in 2016. These warranty costs amounted to \$151 million and were recorded as a charge to cost of sales, recognizing a change in the estimated warranty liability for these products. The majority of the products were delivered to customers by Power-One prior to the acquisition date in 2013. Of this charge, \$131 million related to the products sold by Power-One prior to the acquisition and has been included as an adjustment, in the table below, to determine the segment profit for the division. In addition, lower gross margins were mostly offset by reductions in selling, general and administrative expenses resulting from ongoing restructuring and cost savings programs, as well as lower restructuring and restructuring-related expenses. Furthermore, changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, negatively impacted income from operations by 3 percent.

Operational EBITA

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

(\$ in millions)	2017	2016	2015
Income from operations	1,349	1,091	1,247
Acquisition-related amortization	98	121	133
Restructuring and restructuring-related expenses ⁽¹⁾	28	93	133
Non-operational pension cost	3	3	(3)
Changes in pre-acquisition estimates	8	131	21
Acquisition-related expenses and certain non-operational items	44	8	4
FX/commodity timing differences in income from operations	(20)	12	(15)
Operational EBITA	1,510	1,459	1,520

(1) Amounts also include the incremental implementation costs in relation to the White Collar Productivity program.

In 2017, Operational EBITA increased 3 percent (4 percent excluding the impacts from changes in foreign currencies) compared to 2016, primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

In 2016, Operational EBITA decreased 4 percent (2 percent excluding the impacts from changes in foreign currencies) compared to 2015, primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

Robotics and Motion

Effective January 1, 2017, the former Discrete Automation and Motion division was renamed as the Robotics and Motion division. In connection with this change, certain businesses were transferred to the Electrification Products division including EV charging, solar and power quality businesses. The financial information for 2016 and 2015 has been recast to reflect these organizational changes.

The financial results of our Robotics and Motion division were as follows:

(\$ in millions)	2017	2016	2015	% Change	
				2017	2016
Orders	8,468	7,858	8,272	8%	(5)%
Third-party base orders	7,654	7,029	7,234	9%	(3)%
Order backlog at December 31,	3,961	3,660	3,785	8%	(3)%
Revenues	8,401	7,906	8,188	6%	(3)%
Income from operations	1,035	1,034	1,058	0%	(2)%
Operational EBITA	1,178	1,223	1,288	(4)%	(5)%

Orders

Orders in 2017 were 8 percent higher (8 percent in local currencies). Third-party base orders in 2017 were 9 percent higher (9 percent in local currencies). The third-party base order growth was driven by increased demand for operational solutions in process and discrete industries. Growth was particularly strong in the Robotics business with strong demand from general industry sectors as well as demand for industry solutions such as motors, generators and drives. Demand from the automotive sector remained at a high level. Large orders were received for transportation-related orders and for robotics driven by ongoing investment in the automotive industry as well as investment by the electronics and semiconductor industries. The division noted rising demand for smaller robots and smaller-sized drives and motor as solutions for light industries, such as food and beverage, were in high demand. Orders from process industries such as the oil, gas and mining sectors stabilized.

Orders in 2016 were 5 percent lower (3 percent lower in local currencies) compared to 2015. Third-party base orders were 3 percent lower (flat in local currencies). Third-party base orders were driven by increased demand for traction solutions for transport customers but was offset by the decline in orders from process industries, in particular from oil and gas customers. The division benefited from strong large order intake in the Robotics business and a particularly strong order intake for traction solutions from the rail industry.

The geographic distribution of orders for our Robotics and Motion division was as follows:

(in %)	2017	2016	2015
Europe	35	37	35
The Americas	32	33	34
Asia, Middle East and Africa	33	30	31
Total	100	100	100

In 2017, the share of orders from Asia, Middle East and Africa increased on double-digit growth in China but was somewhat tempered by lower order growth from India, following the introduction of both a new Goods and Services Tax and a new tariff regime for wind renewables. The Americas performed well, with the U.S. market having increased demand for solutions for motors and drives.

In 2016, strengthened demand from Germany for Robotics helped the share of orders from Europe to rise. The share of orders from the Americas fell mainly due to decreased demand from process customers, in particular oil and gas.

Order backlog

The order backlog in 2017 increased 8 percent (1 percent in local currencies) compared to 2016. In local currencies, the backlog improved in the Motors and Generators business, while the backlog in the Drives and Robotics businesses remained stable.

The order backlog in 2016 declined 3 percent. In local currencies, the order backlog was flat. An improved backlog in the Robotics business was offset by a weakened backlog in the Drives and Motors and Generators businesses.

Revenues

In 2017, revenues were 6 percent higher compared to 2016 (6 percent in local currencies). Revenues were positively impacted by growth in deliveries of robotics solutions for the automotive and general industry sectors with stronger growth in the second half of 2017, due to execution of the strong order levels received in the first half of the year. Service revenues were higher as the division serviced more of the installed base and as customers demanded remote monitoring solutions such as ABB Ability™.

In 2016, revenues decreased 3 percent (1 percent in local currencies). Revenues were positively impacted by demand for Robotics solutions for the automotive and general industry sectors. This positive development was more than offset by lower demand for Intelligent Motion™ solutions, particularly in the process industries.

The geographic distribution of revenues for our Robotics and Motion division was as follows:

(in %)	2017	2016	2015
Europe	35	37	36
The Americas	33	33	34
Asia, Middle East and Africa	32	30	30
Total	100	100	100

In 2017, revenues grew in all regions. The relative share of revenues from Europe declined despite modest growth in the region, supported by Finland, Switzerland and Italy. The share of revenues from the Americas remained steady, supported by growth in the United States and Canada but offset partially by lower revenues in Brazil. The share of revenues from Asia, Middle East and Africa increased supported by double-digit revenue growth in China, especially in the Robotics business. This reflects ongoing strong orders from China.

In 2016, the geographical distribution of revenues was similar to 2015. The share of revenues in Europe slightly increased due to the execution of a strong order backlog, while the share of revenues in the Americas decreased due to a decline in the Motors and Generators business. The share of revenues from Asia, Middle East and Africa remained flat as higher revenues in the Robotics business offset the decline in the Drives and the Motors and Generators businesses.

Income from operations

In 2017, income from operations was stable. Income from operations benefited from positive impacts of cost reduction efforts in all businesses, including cost savings from the White Collar Productivity program. In addition, increased volumes, especially in the Robotics business, contributed positively. Income from operations also reflected the positive impact of lower amortization of intangible assets as certain acquired intangible assets were fully amortized. These positive effects were offset by negative impacts including increased commodity prices and the impact of low capacity utilization in the Motors and Generators business. The division also was impacted by project losses recorded in the turnkey full train retrofit business. Changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, negatively impacted income from operations by 1 percent.

Lower revenues and capacity underutilization reduced income from operations in the division by 2 percent in 2016 compared to 2015. A strong performance from the Robotics business plus decreased restructuring and restructuring-related expenses relative to 2015 proved insufficient to outweigh decreased activity levels in the other business units. Changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, negatively impacted income from operations by 3 percent.

Operational EBITA

The reconciliation of income from operations to Operational EBITA for the Robotics and Motion division was as follows:

(\$ in millions)	2017	2016	2015
Income from operations	1,035	1,034	1,058
Acquisition-related amortization	66	94	96
Restructuring and restructuring-related expenses ⁽¹⁾	64	69	111
Non-operational pension cost	2	2	3
Acquisition-related expenses and certain non-operational items	2	18	26
FX/commodity timing differences in income from operations	9	6	(6)
Operational EBITA	1,178	1,223	1,288

(1) Amounts also include the incremental implementation costs in relation to the White Collar Productivity program.

In 2017, Operational EBITA decreased 4 percent (4 percent excluding the impact from changes in foreign currency exchange rates) primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

In 2016, Operational EBITA decreased 5 percent (3 percent excluding the impact from changes in foreign currency exchange rates) primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

Industrial Automation

Effective January 1, 2017, the former Process Automation division was renamed as the Industrial Automation division. The results of B&R, acquired in July 2017, have been included in the Industrial Automation division since the acquisition date.

The financial results of our Industrial Automation division were as follows:

(\$ in millions)	2017	2016	2015	% Change	
				2017	2016
Orders	6,554	5,991	7,398	9%	(19)%
Third-party base orders	5,776	5,200	5,576	11%	(7)%
Order backlog at December 31,	5,376	5,409	6,199	(1)%	(13)%
Revenues	6,880	6,654	7,219	3%	(8)%
Income from operations	782	769	793	2%	(3)%
Operational EBITA	953	897	977	6%	(8)%

Orders

Orders in 2017 increased 9 percent (9 percent in local currencies) primarily reflecting the impact of the B&R acquisition which contributed 7 percent to order growth. Large orders as a percent of total orders was 10 percent, similar to 2016, showing the continued low level of large capital expenditure projects in some end-markets including oil and gas, and mining. The market benefited from selective investment in cruise ships and specialty vessels in 2017. Market demand for maintenance activities and other discretionary investments improved, in particular for oil, gas and chemical customers. Demand for factory automation solutions continued to be positive. In 2017, third-party base orders improved 11 percent (11 percent in local currencies), in particular in the Measurement and Analytics and Process Industries businesses, aided by selective capital expenditure investments in mining. Demand for ABB Ability™ solutions and services also contributed to the positive third-party base order development.

Orders in 2016 declined 19 percent (16 percent in local currencies) compared with 2015. Orders were lower in most Industrial Automation businesses, primarily driven by lower expenditures in the process end-markets, oil and gas, mining and metals, as well as in parts of the marine business. Customers continued to defer capital expenditures for both onshore and offshore oil investments while low commodity prices affected mining companies. Large orders as a percent of divisional revenues were 9 percent compared to 23 percent in 2015. In 2016, third-party base orders declined 7 percent (4 percent in local currencies) as customers deferred service activities and reduced their spare parts inventories.

The geographic distribution of orders for our Industrial Automation division was as follows:

(in %)	2017	2016	2015
Europe	42	42	39
The Americas	23	21	22
Asia, Middle East and Africa	35	37	39
Total	100	100	100

In 2017, the share of orders from the Americas increased helped by strong base order development in the U.S., mainly in the Measurement and Analytics business. In 2017, Europe maintained its share of orders as impacts from weakness in the large German market were offset from the impacts of the inclusion of B&R, for which Europe is currently the largest market. The share of orders from the Asia, Middle East and Africa region declined as the region had only moderate growth due mainly to weak demand in China.

In 2016, orders declined in all regions. Orders in Europe declined less than other regions, thus increasing the geographic share of orders from Europe. The volume in Europe was supported by orders from marine industries, specifically for specialty vessels like cruise ships and ice-going vessels. The share of orders from the Americas fell slightly with order declines in Canada, the U.S. and Chile, where the Process Industries business was affected by low capital expenditure in mining due to low demand from China for raw materials. In the Asia, Middle East and Africa region, orders were lower in the Marine and Ports business due to weak demand for oil and gas related vessels and the lack of infrastructure projects from the ports business. In addition, the Oil, Gas and Chemicals business and the Process Industries business suffered from the lack of large orders in this geographic area.

Order backlog

Order backlog at December 31, 2017 was 1 percent lower (8 percent in local currencies) than at December 31, 2016. Although the division saw some stabilization in demand, shown by a lower decline than in 2016, the market environment remained difficult and political uncertainty weakened confidence in key markets.

Order backlog at December 31, 2016 was 13 percent lower (11 percent in local currencies) than at December 31, 2015. The lower backlog was a result of the lower order intake during the year and the continued execution from the existing backlog.

Revenues

In 2017, revenues increased 3 percent (3 percent in local currencies) compared with 2016 due to the acquisition of B&R, which contributed 6 percent to revenue growth. The majority of the division's other businesses recorded lower revenues as the project business units suffered from weaker opening order backlog and the market environment dampened the book-to-bill ratio. However, revenues were higher in the Measurement and Analytics and Turbocharging businesses. During the year, the division realized higher revenues from faster turning orders in short-cycle businesses which reduced the impact of the lower order backlog at the beginning of 2017.

In 2016, revenues declined 8 percent (5 percent in local currencies) compared with the previous year. The largest decline was in the Process Industries business due to the lower opening order backlog and the continued low level of order activity from the mining and metals sector. A continued lack of orders from the oil and gas industry negatively impacted revenues in the Oil, Gas and Chemicals business. The overall decrease in revenues was mitigated by some stabilization in the Marine and Ports business which was supported by a strong opening order backlog for ice-going and cruise vessels. Revenues were also steady in the Power Generation business due to solid execution from the order backlog. Of the product businesses, Control Technologies had revenue levels similar to the previous year, but the Measurement and Analytics and Turbocharging businesses were slightly lower due to lower order intake.

The geographic distribution of revenues for our Industrial Automation division was as follows:

(in %)	2017	2016	2015
Europe	42	37	35
The Americas	20	22	24
Asia, Middle East and Africa	38	41	41
Total	100	100	100

In 2017, revenues continued to decline in the Americas and in Asia, Middle East and Africa while Europe benefited from the inclusion of B&R as well as higher revenues from the Marine and Ports business. In the Americas region, revenues were higher in the U.S., especially in the Measurement and Analytics, and Turbocharging businesses, though were offset by revenue declines in other countries in the region.

In 2016, revenues declined in the Americas and in Asia, Middle East and Africa, while Europe was stable. This resulted in an increase in the share of revenues from Europe. Except for the Marine and Ports business, revenues in the Americas declined in all businesses, especially the Oil, Gas and Chemicals, Process Industries and Measurement and Analytics businesses. Revenues in Asia, Middle East and Africa were especially impacted by the weak demand from the Process Industries business, particularly mining.

Income from operations

In 2017, income from operations increased 2 percent compared to 2016. The inclusion of B&R reduced income from operations by 4 percent driven by the related charges for amortization of intangible assets and the higher charges in cost of sales resulting from recording the opening balance of inventory at fair value. Offsetting this was the impact from changes in foreign currencies, including the impacts from changes in FX/commodity timing differences summarized in the table below which, combined, positively impacted income from operations by 5 percent. Restructuring and restructuring-related expenses in 2017 of \$87 million were \$8 million higher than in 2016. Restructuring expenses recorded for the White Collar Productivity program were \$58 million lower compared to 2016 because 2017 included a net reversal of \$22 million of estimated amounts recorded in previous years. This benefit was more than offset by an increased amount of restructuring expenses for specific initiatives to align the cost structure and footprint of the operations to reflect changing market conditions. Excluding these impacts, higher income from operations reflects an improved mix, ongoing progress in the division's rationalization efforts and benefits secured from the implementation of the White Collar Productivity program.

In 2016, Income from operations decreased 3 percent compared with 2015. Operating margins were maintained as the division reduced overhead costs, removing organizational costs at the local division level and downsizing operations in areas with low order backlog and low market demand. Key actions included closing warehouses and consolidating operations to fewer locations, but mainly included reducing the number of personnel. Restructuring programs were implemented in all businesses due to a continued weak market outlook. Overall, the number of employees in the Industrial Automation division was reduced by approximately 1,300 during 2016. However, as revenues declined by 8 percent, the aforementioned actions were not enough to maintain previous year level of income from operations. In addition, changes in foreign currencies, including the impacts from FX/commodity timing differences summarized in the table below, negatively impacted income from operations by 3 percent.

Operational EBITA

The reconciliation of Income from operations to Operational EBITA for the Industrial Automation division was as follows:

(\$ in millions)	2017	2016	2015
Income from operations	782	769	793
Acquisition-related amortization	47	11	12
Restructuring and restructuring-related expenses ⁽¹⁾	87	79	135
Non-operational pension cost	7	2	6
Gains and losses on sale of businesses	(2)	—	—
Acquisition-related expenses and certain non-operational items	52	9	14
FX/commodity timing differences in income from operations	(20)	27	17
Operational EBITA	953	897	977

(1) Amounts also include the incremental implementation costs in relation to the White Collar Productivity program.

In 2017, Operational EBITA increased 6 percent (5 percent excluding the impacts from changes in foreign currencies) compared to 2016. The change is due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above. The acquisition of B&R increased Operational EBITA by 5 percent after consideration of the related adjustments in the table above relating to that business.

In 2016, Operational EBITA decreased 8 percent (6 percent excluding the impacts from changes in foreign currencies) compared to 2015, primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

Power Grids

In 2017, we divested our high-voltage cable and cables accessories businesses which were previously part of the Power Grids division. The financial results relating to these divested businesses have been reclassified to Corporate and Other for all periods presented.

The financial results of our Power Grids division were as follows:

(\$ in millions)	2017	2016	2015	% Change	
				2017	2016
Orders	9,600	10,844	11,425	(11)%	(5)%
Third-party base orders	7,421	7,268	7,492	2%	(3)%
Order backlog at December 31,	11,330	11,638	11,707	(3)%	(1)%
Revenues	10,394	10,660	11,245	(2)%	(5)%
Income from operations	797	830	554	(4)%	50%
Operational EBITA	972	998	810	(3)%	23%

Orders

In 2017, orders decreased 11 percent (11 percent in local currencies) compared to 2016. The decrease mainly reflects fewer large orders from India and China as the demand for ultra-high voltage transmission projects in those markets was lower than in the previous year. Consequently, large orders as a percentage of total orders was 18 percent, 11 percentage points lower than in 2016. Significant large orders awarded in 2017 included an order for \$290 million from National Grid and Réseau de Transport d'Electricité (RTE), the British and French grid operators, to provide HVDC technology that will help interconnect the electricity networks of France and the United Kingdom, a \$137 million order relating to the Hinkley Point C nuclear power station in the United Kingdom and a \$71 million traction substations order in connection with the Bangkok metro project. Third-party base orders increased 2 percent (2 percent in local currencies), driven by continued investment into renewables, ongoing electrification of society and the increasing complexity and digitization of the grid (the energy revolution) as well as growing demand from the industry sector. Geographically, the increase in third-party base orders was driven by the Americas and the Asia, Middle East and Africa regions which more than offset a slight decline in Europe. Through the Power Up transformation program, the Power Grids division is refocusing its business model on solutions and services to improve grid control and automation. Consequently, service orders grew 10 percent (9 percent in local currencies) with growth in all business units. In addition, demand continued to

grow for digital solutions, specifically for ABB Ability™ digital substations, ABB Ability™ grid control systems, energy storage and service solutions.

In 2016, orders decreased 5 percent (2 percent in local currencies) compared to 2015, due to general macro-economic uncertainty which led to a reduction in spending by utilities and sluggishness in certain geographic markets such as Saudi Arabia and the U.S. The lower pull-through of orders from other ABB divisions, primarily the Industrial Automation division, reduced orders by 3 percent. Large orders as a percentage of total orders were 29 percent, 2 percent above 2015 levels. Large orders in 2016 included a \$640 million UHVDC transmission link in India and two UHVDC orders for China, each worth more than \$300 million. In 2016, third-party base orders decreased 3 percent (steady in local currencies) with order growth in the Grid Automation, Grid Integration and High Voltage Products businesses offset by market-driven base order weakness in the Transformers business. Service orders decreased 2 percent (flat in local currencies) as increases in the Grid Automation service business were offset by the other businesses.

The geographic distribution of orders for our Power Grids division was as follows:

(in %)	2017	2016	2015
Europe	31	24	32
The Americas	30	28	29
Asia, Middle East and Africa	39	48	39
Total	100	100	100

In 2017, the share of orders in Europe increased from 24 percent to 31 percent, mainly due to the impact of large orders in the United Kingdom as described above. In 2016, ABB received several large HVDC orders from China and India, resulting in a high percentage of orders from the Asia, Middle East and Africa region in that year. The decrease in large orders in Asia, Middle East and Africa during 2017 was not offset by the increase in third-party base orders in the region. As a result, the proportion of orders from the Asia, Middle East and Africa region in 2017 reverted back to a similar level as 2015. Positive base order development in the Americas supported the increase in the share of orders from the region, with base orders in the U.S. and Brazil returning to growth.

In 2016, the share of orders from Asia, Middle East and Africa increased from 39 percent to 48 percent, supported by exceptional order intake in China and India. The share of orders from the Americas declined slightly as both the U.S. and Brazilian markets saw challenging market conditions as the presidential election in the U.S. and a political corruption crisis in Brazil affected order decisions of large utility customers. The share of orders from Europe decreased to 24 percent, compared with 32 percent in 2015, mainly due to the high amount of large orders received from Europe in 2015.

Order backlog

Order backlog at December 31, 2017, decreased by 3 percent (8 percent in local currencies). In 2017, the transmission market experienced decreased activity and the division realized fewer large order opportunities compared to the prior year. Additionally, the strategic repositioning of the business through the Power Up program and the exit from certain business activities also reduced order opportunities, particularly for large EPC projects. The growth in base orders did not offset the decline in large orders, resulting in a decreased order backlog.

Order backlog at December 31, 2016, decreased 1 percent (increased 3 percent in local currencies). The local currency increase in the order backlog was mainly driven by the Transformers business, resulting from a significantly higher share of large orders with long lead times.

Revenues

Revenues in 2017 decreased 2 percent (3 percent in local currencies) compared with 2016. Revenues were impacted by a low opening order backlog and the timing of execution of orders which were not offset by stronger short-cycle orders, specifically in the Grid Automation and Grid Integration businesses. Lower revenues in the Grid Integration business reflects the exit from certain business activities, as well as the de-risking and strategic repositioning of this business. Revenues in the Transformers business were flat, on steady execution of the order backlog. Service revenues grew by 3 percent (1 percent in local currencies) as a result of the continued focus on the service business.

Revenues in 2016 decreased 5 percent (3 percent in local currencies) compared with 2015. The revenue volume in 2016 mainly reflected the scheduled execution of the order backlog. The revenue decrease was mainly attributable to the Grid Integration business as revenues were negatively impacted by the exit from the EPC Solar business and the wind-down of the plant electrification business. In addition, the Grid Integration business revenues were lower due to a strong comparable in 2015 from the offshore wind projects which were either finalized or nearing completion. A lower level of revenues in the Transformers business primarily resulted from order weakness in the U.S. Service revenues increased 4 percent (6 percent in local currencies) compared with 2015.

The geographic distribution of revenues for our Power Grids division was as follows:

(in %)	2017	2016	2015
Europe	30	28	30
The Americas	29	30	31
Asia, Middle East and Africa	41	42	39
Total	100	100	100

In 2017, the large portion of revenues generated from Asia, Middle East and Africa was supported by the increase in the share of orders from Asia, Middle East and Africa in 2016. The share of revenues in Europe increased due to solid execution of the order backlog. As a result of these developments the relative share of revenues from the Americas decreased to 29 percent.

In 2016, the share of revenues from Asia, Middle East and Africa increased to 42 percent, supported by significantly higher revenues from the Transformer business in China. The share of revenues from Europe decreased to 28 percent, mainly due to a lower level of revenues from the Grid Integration business, related to lower revenues in the offshore wind projects described above. The share of revenues from the Americas was lower, mainly driven by lower volumes from the U.S. and Brazil.

Income from operations

In 2017, income from operations was \$797 million, compared with \$830 million in the prior year. In 2017, income from operations was impacted by charges recorded in the EPC business to account for project-related penalties and to reflect the decrease in realized profitability of certain long-term contracts. This was partially offset by the impact of higher gross margins despite lower revenue levels. Margin improvements were driven by continued productivity improvements, cost savings and improved project execution. In 2017, the division increased the amounts spent for sales and research and development under the Power Up transformation program, resulting in increased expenses compared to the prior year. This program commenced at the end of 2016 and aims to accelerate the transformation of the Power Grids division, driving higher margins and revenue growth. Restructuring and restructuring-related expenses in 2017 of \$80 million were \$21 million lower than in 2016, as we recorded a reversal of the previously recorded estimated restructuring expenses in connection with the White Collar Productivity program. This was partially offset by higher restructuring ongoing expenses which relate to footprint changes and capacity adjustments. Acquisition-related expenses and certain non-operational items increased to \$79 million, primarily driven by the charges recorded for certain legal claims as well as a portion of the costs relating to the Power Up program. Income from operations also benefited from changes in foreign currencies, including changes in FX/commodity timing differences in income from operations, which, combined, increased the division's income from operations by 4 percent compared to the prior year.

In 2016, income from operations increased by \$276 million to \$830 million compared with \$554 million in 2015. The impact from lower revenues was more than offset by a higher gross margin, driven by solid project execution, improved productivity and continued cost savings. For 2016, the division also had lower research and development expenses. Restructuring and restructuring-related expenses in 2016 of \$101 million were \$58 million lower than in 2015 and included additional charges for the White Collar Productivity program, as well as initiatives to align the cost structure and footprint of certain operations to reflect changing market conditions. Acquisition-related amortization in 2016 was lower compared to 2015. In addition, changes in foreign currencies, including the changes in FX/commodity timing differences in income from operations decreased the division's income from operations by 6 percent compared to 2015.

Operational EBITA

The reconciliation of income from operations to Operational EBITA for the Power Grids division was as follows:

(\$ in millions)	2017	2016	2015
Income from operations	797	830	554
Acquisition-related amortization	36	35	52
Restructuring and restructuring-related expenses ⁽¹⁾	80	101	159
Non-operational pension cost	3	(2)	3
Gains and losses on sale of businesses	—	—	24
Acquisition-related expenses and certain non-operational items	79	20	17
FX/commodity timing differences in income from operations	(23)	14	1
Operational EBITA	972	998	810

(1) Amounts also include the incremental implementation costs in relation to the White Collar Productivity program.

In 2017, Operational EBITA decreased 3 percent (3 percent excluding the impacts from changes in foreign currencies) compared to 2016, primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

In 2016, Operational EBITA increased 23 percent (25 percent excluding the impacts from changes in foreign currencies) compared to 2015, primarily due to the reasons described under “Income from operations”, excluding the explanations related to the reconciling items in the table above.

Corporate and Other

Income (loss) from operations for Corporate and Other was as follows:

(\$ in millions)	2017	2016	2015
Corporate headquarters and stewardship	(374)	(380)	(355)
Corporate research and development	(128)	(133)	(144)
Corporate real estate	45	47	50
Net gain (loss) from sale of businesses	250	(10)	4
White Collar Productivity program costs	(107)	(199)	(130)
Misappropriation loss, net	(9)	(73)	—
Divested businesses	(129)	36	(10)
Other	(83)	(29)	(32)
Total Corporate and Other	(535)	(741)	(617)

In 2017, the net loss from operations within Corporate and Other was \$535 million, a decrease of \$206 million compared to 2016. The decrease was primarily due to the recognition of the gain for the sale of the cables businesses and lower restructuring and implementation costs related to White Collar Productivity program. In 2016, the net loss from operations was higher than in 2015 primarily due to higher costs related to the White Collar Productivity program and the misappropriation loss described below.

Corporate headquarter and stewardship costs were \$374 million in 2017, slightly lower than the \$380 million reported in 2016, primarily due to the costs in 2016 associated with the new ABB branding and cost related to the Next Level Strategy program. This also is the reason that corporate headquarters and stewardship costs increased in 2016 compared to 2015.

Corporate real estate primarily includes income from property rentals and gains from the sale of real estate properties. In 2017, 2016 and 2015, income from operations in Corporate real estate included gains from the sale of real estate properties of \$28 million, \$33 million and \$26 million, respectively.

The net gain recorded from sale of businesses in 2017 related to the sales of the cables businesses and the Oil & Gas EPC business.

In 2017, ABB recorded a total of \$107 million in Corporate and Other for both restructuring and related expenses as well as program implementation costs for the White Collar Productivity program. In 2016 and 2015, costs incurred in connection with this program amounted to \$199 million and \$130 million, respectively. These costs relate mainly to employee severance costs and both external and internal costs relating to the execution of the program. For further information on the White Collar Productivity program see “Restructuring and other cost savings initiatives” below.

In 2016, we recorded a loss of \$73 million, net of expected insurance recoveries, for the misappropriation of cash by the treasurer of our subsidiary in South Korea. In 2017, additional losses of \$9 million were recorded.

The historical results of operations for certain divested businesses are presented in Corporate and Other. In 2017, 2016 and 2015, this primarily includes the income and loss from operations of the cables businesses, which were disposed in March 2017 and the Oil & Gas EPC business, which was transferred to a new joint venture with Arkad in December 2017. The amount in 2017 also includes charges of \$94 million for changes (after divestment) in the amount recorded for certain retained liabilities associated with the divested cables businesses.

“Other” consists of operational costs of our Global Treasury Operations, operating income or loss in other non-core businesses and certain other charges such as costs and penalties associated with legal cases, environmental expenses and impairment charges related to investments. “Other” costs were higher in 2017 as compared to 2016 as the costs a year earlier included the impact of a reduction in certain insurance-related provisions for self-insured risks offset by amounts recorded for certain pension curtailment costs. In 2015, “Other” also included a reduction of insurance-related provisions for self-insured risks.

Restructuring and other cost savings initiatives

White Collar Productivity program

In September 2015, we announced a two-year program aimed at making ABB leaner, faster and more customer-focused. Productivity improvements include the rapid expansion and use of regional shared service centers as well as the streamlining of global operations and head office functions, with business units moving closer to their respective key markets. In the course of this program, we implemented and executed various restructuring initiatives across all operating segments and regions. As of December 31, 2017, ABB has incurred substantially all costs related to the White Collar Productivity program.

The program was originally expected to generate cost savings of approximately \$1.0 billion and be realized from 2016 and increasing through the end of 2017. During 2016, we re-assessed the expected amount of cost savings and increased the expected total annual rate of cost savings from the program by 30 percent to approximately \$1.3 billion. The program’s final cost savings realized amount to approximately \$1.4 billion. During 2017, cost savings of approximately \$0.5 billion were realized. These savings are primarily being realized as reductions in cost of sales, selling, general and administrative expenses and non-order related research and development expenses.

The following table outlines the costs incurred in 2017, 2016 and 2015 and the cumulative amount of costs incurred under the program.

(\$ in millions)	Costs incurred in			Cumulative costs
	2017	2016 ⁽¹⁾	2015 ⁽¹⁾	incurred up to December 31, 2017 ⁽¹⁾
Electrification Products	(17)	15	74	72
Robotics and Motion	(14)	26	44	56
Industrial Automation	(22)	36	96	110
Power Grids	(38)	33	70	65
Corporate and Other	(34)	30	86	82
Total	(125)	140	370	385

(1) Total costs have been recast to reflect the reorganization of the Company’s operating segments as outlined in Note 23 to our Consolidated Financial Statements.

During the course of the restructuring program total expected costs were reduced mainly due to the realization of significantly higher than originally expected attrition and internal redeployment rates. The reductions were made across all operating divisions as well as for corporate functions.

In 2017, net restructuring reversals of \$125 million was recorded mainly due to higher than expected rates of attrition and internal redeployment. In 2016, net restructuring costs of \$140 million were recorded based on the anticipated number of personnel to be impacted by the program and a country-specific average severance cost per person. Various functions including marketing and sales, supply chain management, research and development, engineering, service, and certain other support functions were impacted in various phases commencing in 2015 and continuing in 2016 and in 2017.

In 2017 and 2016, we experienced a significantly higher than expected rate of attrition and redeployment and a lower than expected severance cost per employee for the employee groups affected by the restructuring programs initiated in 2015 and 2016. As a result, in 2017, we adjusted the amount of our estimated liability for restructuring which was recorded in 2016 and 2015. This change in estimate of \$164 million during 2017 resulted in a reduction primarily in cost of sales of \$90 million and in selling, general and administrative expenses of \$63 million in the year. In 2016, we adjusted the amount of our estimated liability for restructuring which was recorded in 2015. This change in estimate of \$103 million during 2016 resulted in a reduction primarily in cost of sales of \$49 million and in selling, general and administrative expenses of \$38 million for the year.

At December 31, 2017, we have substantially completed the White Collar Productivity program and incurred total restructuring charges of \$385 million under this program.

The majority of the remaining cash outlays, primarily for employee severance benefits, are expected to occur in 2018. We expect that our cash flow from operating activities will be sufficient to cover any obligations under this restructuring program.

For details of the nature of the costs incurred and their impact on the Consolidated Financial Statements, see “Note 22 Restructuring and related expenses” to our Consolidated Financial Statements.

Other restructuring-related activities and cost savings initiatives

In 2017, 2016 and 2015, we also executed other restructuring-related and cost saving measures to sustainably reduce our costs and protect our profitability. Costs associated with these other measures amounted to \$249 million, \$171 million and \$256 million in 2017, 2016 and 2015, respectively.

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.

During 2017, 2016 and 2015, our financial position was strengthened by the positive cash flow from operating activities of \$3,799 million, \$3,843 million and \$3,818 million, respectively.

Our net debt is shown in the table below:

(\$ in millions)	December 31,	
	2017	2016
Short-term debt and current maturities of long-term debt	738	1,003
Long-term debt	6,709	5,800
Cash and equivalents	(4,526)	(3,644)
Marketable securities and short-term investments	(1,102)	(1,953)
Net debt (defined as the sum of the above lines)	1,819	1,206

Net debt at December 31, 2017, increased \$613 million compared to December 31, 2016, as cash flows from operating activities during 2017 of \$3,799 million was more than offset by cash outflows for acquisitions of businesses (primarily B&R) (\$2,130 million), the dividend payment to our shareholders (\$1,635 million), net purchases of property, plant and equipment and intangible assets (\$883 million) and amounts paid to purchase treasury stock (\$251 million). Other significant transactions affecting our liquidity included the issuance of treasury shares for \$163 million and payments of dividends to noncontrolling shareholders of \$127 million. Movements in foreign exchange rates increased net debt by approximately \$54 million. See “Financial position”, “Investing activities” and “Financing activities” for further details.

Our Group 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, 2017 and 2016, the proportion of our aggregate “Cash and equivalents” and “Marketable securities and short-term investments” managed by our Group Treasury Operations amounted to approximately 49 percent and 57 percent, respectively.

Throughout 2017 and 2016, the 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 corporate commercial paper, money market funds, and in some cases, government securities. During 2017 and 2016, we also continued to place limited funds in connection with reverse repurchase agreements. We actively monitor credit risk in our investment portfolio and hedging activities. Credit risk exposures are controlled in accordance with policies approved by our senior management to identify, measure, monitor and control credit risks. We closely monitor developments in the credit markets and make appropriate changes to our investment policy as deemed necessary. The rating criteria we require for our counterparties have remained unchanged during 2017 (compared to 2016) as follows: a minimum rating of A/A2 for our banking counterparties (with limited exceptions), while the minimum required rating for investments in short-term corporate commercial paper is A-1/P-1. In addition to rating criteria, we have specific investment parameters and 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 35 percent of our cash and cash equivalents held at December 31, 2017, was in U.S. dollars, while other significant amounts were held in Chinese renminbi (23 percent), euro (17 percent) and Indian rupee (5 percent).

We believe the 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 twelve months. See “Disclosures about contractual obligations and commitments”.

Due to the nature of our operations, 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:

(\$ in millions)	December 31,	
	2017	2016
Short-term debt and current maturities of long-term debt	738	1,003
Long-term debt:		
Bonds	6,487	5,660
Other long-term debt	222	140
Total debt	7,447	6,803

The decrease in short-term debt in 2017 was due to the repayment at maturity of both our USD 500 million 1.625% Notes and our AUD 400 million 4.25% Notes. This was partially offset by the reclassification of our CHF 350 million 1.5% Bonds due in 2018. In addition, we increased the amount of issued commercial paper (\$259 million outstanding at December 31, 2017, compared to \$57 million outstanding at December 31, 2016).

Our debt has been obtained in a range of currencies and maturities and on 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 to effectively convert fixed rate debt into floating rate liabilities. After considering the effects of interest rate swaps, the effective average interest rate on our floating rate long-term debt (including current maturities) of \$3,213 million and our fixed rate long-term debt (including current maturities) of \$3,907 million was 0.6 percent and 3.5 percent, respectively. This compares with an effective rate of 1.3 percent for floating rate long-term debt of \$1,745 million and 2.9 percent for fixed rate long-term debt of \$4,923 million at December 31, 2016.

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

During 2016 we exercised our second and final option to extend the maturity of our \$2 billion multicurrency revolving credit facility from 2020 to 2021.

No amount was drawn under the credit facility at December 31, 2017 and 2016. The facility is available for general corporate purposes. The facility 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, 2017, 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, 2017, \$259 million was outstanding under the \$2 billion program in the United States, compared to \$57 million outstanding at December 31, 2016.

No amount was outstanding under the \$2 billion Euro-commercial paper program at December 31, 2017 and 2016.

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. During 2017, we issued EUR 750 million 0.75% Notes, due 2024, and during 2016, we issued EUR 700 million 0.625% Notes, due 2023, under the program. At December 31, 2017, three bonds (principal amount of EUR 1,250 million, due in 2019, principal amount of EUR 700 million, due in 2023 and principal amount of EUR 750 million, due in 2024) having a combined carrying amount of \$3,216 million, were outstanding under the program. At December 31, 2016, two bonds (principal amount of EUR 1,250 million, due in 2019, and principal amount of EUR 700 million, due in 2023) having a combined carrying amount of \$2,043 million, were outstanding under the program.

Australian program for the issuance of debt

During 2012, we set up a program for the issuance of up to AUD 1 billion (equivalent to \$779 million, using December 31, 2017, exchange rates) of medium-term notes and other 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. No amount was outstanding under this program at December 31, 2017. At December 31, 2016, one bond, having a principal amount of AUD 400 million, which matured in 2017, was outstanding under the program. The carrying amount of the bond at December 31, 2016, was \$291 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 both December 31, 2017 and 2016, our long-term debt was rated A2 by Moody’s and A by Standard & Poor’s.

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, including: China, Egypt, India, Indonesia, South Korea, Malaysia, Russian Federation, Taiwan, Thailand and Turkey. 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 Group 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, 2017 and 2016, 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 \$2,222 million and \$1,737 million, respectively.

During 2017 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

(\$ in millions)	December 31,		% Change
	2017	2016	
Current assets			
Cash and equivalents	4,526	3,644	24%
Marketable securities and short-term investments	1,102	1,953	(44)%
Receivables, net	10,416	9,696	7%
Inventories, net	5,059	4,347	16%
Prepaid expenses	189	176	7%
Other current assets	647	688	(6)%
Assets held for sale	—	548	n.a.
Total current assets	21,939	21,052	4%

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 2017 as the amount of excess liquidity available for investments was reduced as funds were needed for acquisitions of businesses. The reduction resulted primarily in lower amounts deposited with banks with fixed deposit terms over three months and lower investments in money market funds (see “Cash flows—Investing activities”, below, and “Note 4 Cash and equivalents, marketable securities and short-term investments” to our Consolidated Financial Statements).

Receivables increased 7 percent (2 percent in local currencies). The increase was primarily due to the impact of the acquisition of B&R. For details on the components of Receivables, see “Note 7 Receivables, net” to our Consolidated Financial Statements.

Inventories increased 16 percent (6 percent in local currencies). The increase in inventory was primarily due to the impact of the B&R acquisition but also due to a planned increase of inventories to deliver against expected growth in certain product businesses.

(\$ in millions)	December 31,		% Change
	2017	2016	
Current liabilities			
Accounts payable, trade	5,419	4,446	22%
Billings in excess of sales	1,251	1,241	1%
Short-term debt and current maturities of long-term debt	738	1,003	(26)%
Advances from customers	1,367	1,398	(2)%
Provisions for warranties	1,231	1,142	8%
Other provisions	1,882	1,765	7%
Other current liabilities	4,385	3,936	11%
Liabilities held for sale	—	218	n.a.
Total current liabilities	16,273	15,149	7%

Accounts payable increased 22 percent (14 percent in local currencies) primarily as a result of continuing efforts to negotiate extended payment terms with suppliers.

The decrease in Short-term debt and current maturities of long-term debt was primarily due to the repayment at maturity of both the USD 500 million and AUD 400 million bonds partially offset by increases in the U.S. commercial paper program of \$202 million and the reclassification to short-term debt of \$391 million, mainly from the CHF 350 million bond.

Advances from customers decreased 2 percent (9 percent in local currencies) due to the impact of lower level of advances received on orders, especially in the Transformers business, which was partially offset by the increase in advances received in the Robotics and Drives businesses.

Provisions for warranties increased 8 percent (decreased 1 percent in local currencies), primarily due to a decrease in warranty expenses in the solar business offset by the acquisition of B&R.

Other provisions increased 7 percent (flat in local currencies) as higher contract-related provisions were offset by lower restructuring provisions in local currencies.

The increase in Other current liabilities of 11 percent (5 percent in local currencies) was primarily due to increases in non-trade payables and income tax payable partially offset by lower derivative liabilities.

(\$ in millions)	December 31,		% Change
	2017	2016	
Non-current assets			
Property, plant and equipment, net	5,363	4,743	13%
Goodwill	11,199	9,501	18%
Other intangible assets, net	2,622	1,996	31%
Prepaid pension and other employee benefits	144	90	60%
Investments in equity-accounted companies	158	170	(7)%
Deferred taxes	1,250	1,118	12%
Other non-current assets	587	532	10%
Total non-current assets	21,323	18,150	17%

In 2017, Property, plant and equipment increased 13 percent (6 percent in local currencies) partly due to the acquisition of B&R and also due to the investment in a new robotics factory in the U.S. and the ongoing investment in the Xiamen hub in China.

In 2017, Goodwill increased 18 percent (14 percent in local currencies) due primarily to the acquisition of B&R.

Other intangible assets increased 31 percent (27 percent in local currencies) primarily due to the addition of intangibles related to the acquisition of B&R, partially offset by the impact of amortization of intangibles in 2017. For additional information on intangible assets see “Note 11 Goodwill and other intangible assets” to our Consolidated Financial Statements.

(\$ in millions)	December 31,		% Change
	2017	2016	
Non-current liabilities			
Long-term debt	6,709	5,800	16%
Pension and other employee benefits	1,882	1,834	3%
Deferred taxes	1,099	918	20%
Other non-current liabilities	1,950	1,604	22%
Total non-current liabilities	11,640	10,156	15%

Long-term debt increased 16 percent of which 7 percentage points were due to movements in foreign exchange rates. The remaining change was due primarily to the issuance of the new EUR 750 million bond for the proceeds of \$824 million, offset by the reclassification to short-term debt of \$391 million mainly from the CHF 350 million bond. See “Liquidity and Capital Resources—Debt and interest rates” for information on long-term debt.

The increase in Pension and other employee benefits was primarily due to foreign exchange rate movement. For additional information, see “Note 17 Employee benefits” to our Consolidated Financial Statements.

The increase in Deferred taxes was primarily due to the deferred taxes recorded from the acquisition of B&R.

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

Cash flows

In the Consolidated Statements of Cash Flows, the effects of discontinued operations are not segregated.

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

(\$ in millions)	2017	2016	2015
Net cash provided by operating activities	3,799	3,843	3,818
Net cash used in investing activities	(1,450)	(1,305)	(974)
Net cash used in financing activities	(1,735)	(3,355)	(3,380)
Effects of exchange rate changes on cash and equivalents	268	(104)	(342)
Net change in cash and equivalents—continuing operations	882	(921)	(878)

Operating activities

(\$ in millions)	2017	2016	2015
Net income	2,365	2,034	2,055
Depreciation and amortization	1,101	1,135	1,160
Total adjustments to reconcile net income to net cash provided by operating activities (excluding depreciation and amortization)	(385)	1	(55)
Total changes in operating assets and liabilities	718	673	658
Net cash provided by operating activities	3,799	3,843	3,818

Operating activities in 2017 provided net cash of \$3,799 million, a decrease from 2016 of 1 percent as lower cash effective net income (net income adjusted for depreciation, amortization and other non-cash items) was mostly offset by the cash effects of stronger net working capital management. Working capital improvements included a significant increase in trade and non-trade payables, resulting from continuing company-wide efforts to extend payment terms with suppliers. Partially offsetting these benefits were cash outflows resulting from higher inventories and trade receivables. In addition, the timing of income tax payments positively impacted cash provided by operating activities.

Operating activities in 2016 provided net cash of \$3,843 million, an increase from 2015 of 1 percent as Net income was steady and net working capital improvements continued to contribute to positive cash flows. Net working capital management improvements included a reduction of inventories and a significant increase in trade payables, resulting from focused efforts to extend payment terms with suppliers. The timing of income tax payments also improved cash provided by operating activities. These benefits were offset by impacts from lower advances from customers. In addition, cash flows from operating activities was negatively impacted by the misappropriation of \$103 million in cash by the treasurer of our subsidiary in South Korea.

Investing activities

(\$ in millions)	2017	2016	2015
Purchases of marketable securities (available-for-sale)	(312)	(1,214)	(1,925)
Purchases of short-term investments	(393)	(3,092)	(614)
Purchases of property, plant and equipment and intangible assets	(949)	(831)	(876)
Acquisition of businesses (net of cash acquired) and increases in cost- and equity-accounted companies	(2,130)	(26)	(56)
Proceeds from sales of marketable securities (available-for-sale)	514	1,057	434
Proceeds from maturity of marketable securities (available-for-sale)	100	539	1,022
Proceeds from short-term investments	945	2,241	653
Proceeds from sales of property, plant and equipment	66	61	68
Proceeds from sales of businesses (net of transaction costs and cash disposed) and cost- and equity-accounted companies	607	(1)	69
Net cash from settlement of foreign currency derivatives	63	(57)	231
Other investing activities	39	18	20
Net cash used in investing activities	(1,450)	(1,305)	(974)

Net cash used in investing activities in 2017 was \$1,450 million, compared to \$1,305 million in 2016. Cash used to fund acquisitions of businesses (primarily B&R) was significantly higher than in 2016 but was partially offset by sales of marketable securities and short-term investments as well as the proceeds received from sales of businesses (primarily the high-voltage cables business). In addition, changes in the impacts from derivative cash flows classified as investing activities reduced cash used in investing activities by \$120 million. These cash flows primarily result from the maturity and settlement of derivatives that are in place to hedge foreign currency exposures on internal subsidiary funding and the amount of the settlement results from movements in foreign currency exchange rates throughout the year. We also had higher purchases of property, plant and equipment and intangible assets due to higher investments in information technology assets as well as specific investments in facilities in the United States and China.

Net cash used in investing activities in 2016 was \$1,305 million, compared to \$974 million in 2015. The change was primarily due to the change in the cash impacts from derivative cash flows classified as investing activities as in 2016 we had net outflows of \$57 million, compared to inflows of \$231 million in 2015, on settlement of foreign currency derivatives relating to investing activities. Total cash disbursements for the purchase of property, plant and equipment and intangible assets were lower in 2016 compared to 2015. The change was primarily due to movements in foreign exchange rates and an increase in the amount of unpaid purchases.

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

(\$ in millions)	2017	2016	2015
Construction in process	672	595	568
Purchase of machinery and equipment	155	168	200
Purchase of land and buildings	44	28	50
Purchase of intangible assets	78	40	58
Purchases of property, plant and equipment and intangible assets	949	831	876

In 2017, we decreased the amount of our excess liquidity invested in marketable securities and short-term investments as funds were needed for acquisitions of businesses while in 2016 and 2015, we increased the amounts invested in marketable securities and short-term investments. Marketable securities and short-term investments at December 31, 2017, consisted primarily of fixed-term deposits with banks, available-for-sale debt securities as well as amounts placed in reverse repurchase agreements. At December 31, 2016, amounts were placed primarily in fixed-term deposits with banks and in short-term money market funds. At December 31, 2015, amounts were placed primarily in short-term money market funds and corporate commercial paper. The net decrease in investments during 2017 resulted in an inflow of \$854 million while in 2016 and 2015, the net increase in investments resulted in outflows of \$469 million and \$430 million, respectively.

In 2017, acquisitions of businesses primarily represents the purchase of B&R, which was acquired in July, while proceeds from sales of businesses primarily represents the divestment of the high-voltage cables and cable accessories businesses. In 2016 and 2015, there were no significant acquisitions or divestments of businesses.

Financing activities

(\$ in millions)	2017	2016	2015
Net changes in debt with maturities of 90 days or less	207	(152)	3
Increase in debt	921	912	68
Repayment of debt	(1,007)	(1,249)	(101)
Delivery of shares	163	192	107
Purchase of treasury stock	(251)	(1,299)	(1,487)
Dividends paid	(1,635)	—	(1,357)
Reduction in nominal value of common shares paid to shareholders	—	(1,610)	(392)
Dividends paid to noncontrolling shareholders	(127)	(122)	(137)
Other financing activities	(6)	(27)	(84)
Net cash used in financing activities	(1,735)	(3,355)	(3,380)

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

In 2017, the net cash inflow for debt with maturities of 90 days or less primarily related to an increase of \$202 million in borrowings outstanding under our commercial paper program in the U.S. In 2016, the net cash outflow related primarily to a reduction of \$75 million in the amount outstanding under our commercial paper program in the U.S. and net repayments of short-term borrowings in various countries.

In 2017, the increase in debt was due primarily to the issuance of our EUR 750 million 0.75% Notes due 2024 (equal to \$824 million at date of issuance). In 2016, the increase in debt was due primarily to the issuance of our EUR 700 million 0.625% Notes due 2023 (equal to \$807 million at date of issuance). In 2015, increases in other debt included cash flows from additional borrowings in various countries.

During 2017, \$1,007 million of debt was repaid, reflecting primarily the repayment at maturity of both the USD 500 million 1.625% Notes and the AUD 400 million 4.25% Notes (in total equivalent to \$803 million at dates of repayment). During 2016, \$1,249 million of debt was repaid, reflecting primarily the repayment at maturity of the USD 600 million 2.5% Notes and CHF 500 million 1.25% Bonds (in total equivalent to \$1,106 million at dates of repayment). In 2015 repayment of debt reflects repayments of borrowings in various countries.

In 2017, “Purchase of treasury stock” reflects the cash paid to purchase 10 million of our own shares on the open market. In 2016 and 2015, the amount reflects the cash paid to purchase 65 million and 73 million, respectively, of our own shares in connection with the share buyback program which was announced in September 2014 and completed in September 2016. For additional information on the share buyback program see “Note 19 Stockholders’ equity” to our Consolidated Financial Statements.

Disclosures about contractual obligations and commitments

The contractual obligations presented in the table below represent our estimates of future payments under fixed contractual obligations and commitments. The amounts in the table may differ from those reported in our Consolidated Balance Sheet at December 31, 2017. 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 in the table. The following table summarizes certain of our contractual obligations and principal and interest payments under our debt instruments, leases and purchase obligations at December 31, 2017.

(\$ in millions)	<u>Total</u>	<u>Less than 1 year</u>	<u>1 - 3 years</u>	<u>3 - 5 years</u>	<u>More than 5 years</u>
Payments due by period					
Long-term debt obligations	6,953	378	1,558	2,532	2,485
Interest payments related to long-term debt obligations	1,370	191	328	192	659
Operating lease obligations	1,516	390	541	315	270
Capital lease obligations ⁽¹⁾	292	48	71	46	127
Purchase obligations	4,967	4,104	685	156	22
Total	<u>15,098</u>	<u>5,111</u>	<u>3,183</u>	<u>3,241</u>	<u>3,563</u>

(1) Capital lease obligations represent the total cash payments to be made in the future and include interest expense of \$116 million and executory costs of \$2 million.

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 the long-term debt balance reflected in “Note 12 Debt” to our Consolidated Financial Statements due to the impacts of fair value hedge accounting adjustments and premiums or discounts on certain debt. In addition, capital lease obligations are shown separately in the table above while they are combined with Long-term debt amounts in our Consolidated Balance Sheets.

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 be to 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.

Of the total of \$1,230 million unrecognized tax benefits (net of deferred tax assets) at December 31, 2017, it is expected that \$32 million will be paid within less than a year. However, we cannot make a reasonably reliable estimate as to the related future payments for the remaining amount.

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,	
	2017	2016
	Maximum potential payments	
(\$ in millions)		
Performance guarantees	1,775	193
Financial guarantees	17	69
Indemnification guarantees	72	71
Total	1,864	333

The carrying amounts of liabilities recorded in the Consolidated Balance Sheets in respect of the above guarantees were not significant at December 31, 2017 and 2016, and reflect our best estimate of future payments, which we may incur as part of fulfilling our guarantee obligations.

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 the Company does not fulfill its contractual obligations. ABB would then have an obligation to reimburse the financial institution for amounts paid under the performance bonds. At December 31, 2017 and 2016, the total outstanding performance bonds aggregated to \$7.7 billion and \$7.9 billion, respectively. There have been no significant amounts reimbursed to financial institutions under these types of arrangements in 2017, 2016 and 2015.

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 section of the Annual 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 Regulations & Corporate Governance Guidelines (which includes the regulations 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 and the Addendum to the ABB Code of Conduct for Members of the Board of Directors and the Executive Committee (EC). 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.

Compensation Governance and Board and EC compensation

Information about ABB's Compensation Governance and Board and EC compensation and shareholdings can be found in the section titled "Compensation" below.

BOARD OF DIRECTORS

Board and Board Committees (2017 - 2018 Board Term)

Board of Directors		
Chairman: Peter R. Voser	Matti Alahuhta	Louis R. Hughes
Vice Chairman: Jacob Wallenberg	David Constable	David Meline
	Frederico Fleury Curado	Satish Pai
	Lars Förberg	Ying Yeh
Finance, Audit and Compliance Committee	Governance and Nomination Committee	Compensation Committee
Louis R. Hughes (chairman)	Peter R. Voser (chairman)	David Constable (chairman)
David Meline	Matti Alahuhta	Frederico Fleury Curado
Satish Pai	Lars Förberg	Ying Yeh
	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 Regulations & Corporate Governance Guidelines.

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 members of the Board committees either are required to be independent or are elected directly by the shareholders. 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.

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 skill 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 Regulations and Corporate Governance Guidelines state that board members shall avoid entering into any situation in which their personal or financial interest 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 independent auditors' qualifications and independence, (4) the performance of ABB's internal audit function and external auditors, and (5) ABB's capital structure, funding requirements and financial risk and policies.

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. As required by the U.S. Securities and Exchange Commission (SEC) at least one member of the FACC has to be an audit committee financial expert. The Board has determined that each member of the FACC is an audit committee financial expert.

Governance and Nomination Committee

The GNC is responsible for (1) overseeing corporate governance practices within ABB, (2) nominating candidates for the Board, the role of CEO and other positions on the Executive Committee, and (3) 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. The Chairman of the Board (unless he is already a member) 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.

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 must be diverse 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 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. Our Articles of Incorporation 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 Regulations & Corporate Governance Guidelines (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 (2017-2018 Board Term):

Name	Nationality	Year of Birth	First election at AGM	End of current term	Non-Executive	Independent
Peter R. Voser	CH	1958	2015	2018	Yes	Yes
Jacob Wallenberg	SE	1956	1999	2018	Yes	Yes
Matti Alahuhta	FI	1952	2014	2018	Yes	Yes
David Constable	CA	1961	2015	2018	Yes	Yes
Frederico Fleury Curado	BR	1961	2016	2018	Yes	Yes
Lars Förberg	SE	1965	2017	2018	Yes	Yes
Louis R. Hughes	US	1949	2003	2018	Yes	Yes
David Meline	CH/US	1957	2016	2018	Yes	Yes
Satish Pai	IN	1961	2016	2018	Yes	Yes
Ying Yeh	CN	1948	2011	2018	Yes	Yes

Peter R. Voser has been a member and chairman of ABB's Board of Directors since April 2015. He is a member of the boards of directors of Roche Holding Ltd (Switzerland), IBM Corporation (U.S.) and Temasek Holdings (Private) Limited (Singapore). He is also a member of the board of Catalyst (U.S.), a non-profit organization. In addition, he is the chairman of the board of trustees of the St. Gallen Foundation for International Studies. He was the chief executive officer of Royal Dutch Shell plc (The Netherlands) from 2009 until 2013. 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 AB, SAS AB, FAM AB and Patricia Industries AB (all Sweden). He is also a member of the board of directors of the Knut and Alice Wallenberg Foundation (Sweden) and vice-chairman of the Swedish American Chamber of Commerce (U.S.). Mr. Wallenberg was born in 1956 and is a Swedish citizen.

Matti Alahuhta has been a member of ABB's Board of Directors since April 2014. He is the chairman of the boards of Outotec Corporation and of DevCo Partners Oy (both Finland). He is also a member of the boards of directors of KONE Corporation (Finland) and AB Volvo (Sweden). He has formerly served as President and CEO of KONE Corporation and in several Executive positions at Nokia Corporation (Finland). Mr. Alahuhta was born in 1952 and is a Finnish citizen.

David Constable has been a member of ABB's Board of Directors since April 2015. He was the chief executive officer of Sasol Limited (South Africa) from 2011 until June 2016 and in addition he was the president from 2014 until June 2016. He joined Sasol after more than 29 years with Fluor Corporation (U.S.). He is a member of the boards of directors of Rio Tinto plc (U.K.), Rio Tinto Limited (Australia) and Anadarko Petroleum Corporation (U.S.). Mr. Constable was born in 1961 and is a Canadian citizen.

Frederico Fleury Curado has been a member of ABB's Board of Directors since April 2016. In October 2017 he became the CEO of Ultrapar Participações S.A. (Brazil). He is a member of the board of directors of Transocean Ltd. (Switzerland). He was the CEO of Embraer S.A. (Brazil) from 2007 until June 2016. Mr. Curado was born in 1961 and is a Brazilian 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 citizen.

Louis R. Hughes has been a member of ABB's Board of Directors since May 2003. He is the chairman of the board of InZero Systems (formerly GBS Laboratories LLC) (U.S.). He is also a member of the supervisory board of Akzo Nobel N.V. (The Netherlands) and a member of the board of directors of Nokia Corporation (Finland). Mr. Hughes was born in 1949 and is a U.S. citizen.

David Meline has been a member of ABB's Board of Directors since April 2016. He is the chief financial officer of Amgen Inc. (U.S.). From 2008 to 2014 Mr. Meline was with the 3M Company (U.S.), where he served as Chief Financial Officer. 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 Swiss and U.S. citizen.

Satish Pai has been a member of ABB's Board of Directors since April 2016. He is the managing director and 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.

Ying Yeh has been a member of ABB's Board of Directors since April 2011. She is also a member of the board of directors of Samsonite International S.A. (Luxembourg). Ms. Yeh was born in 1948 and is a Chinese citizen.

As of December 31, 2017, all Board members were non-executive and independent directors and none of ABB's Board members held any official functions or political posts. Further information on ABB's Board members can be found by clicking on the ABB Board of Directors CV link which can be found at www.abb.com/about/corporate-governance.

Board Meetings

The Board meets as frequently as needed but at least four times per annual Board term. The Board has meetings with Executive Committee members as well as private meetings without them. 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. Further, Board members are entitled to information concerning ABB's business and affairs. Decisions made at the Board meetings are recorded in written minutes of the meetings.

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. The table below shows the number of meetings held during 2017 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.

Meetings and attendance	2017									
	Pre Annual General Meeting 2017					Post Annual General Meeting 2017				
	Board		FACC	GNC	CC	Board ⁽³⁾		FACC	GNC	CC
	Mtg.	Conf. Call				Mtg.	Conf. Call			
Average duration (hours)	8	1.5	2.0	1.5	1.5	8	1.5	2.4	1.5	2
Number of meetings	2	3	7	2	3	5	2	7	4	4
Meetings attended:										
Peter R. Voser	2	3	–	2	–	5	2	–	4	–
Jacob Wallenberg	2	2	–	2	–	5	1	–	4	–
Matti Alahuhta	2	3	–	2	–	5	1	–	4	–
David Constable	2	3	–	–	3	5	1	–	–	4
Frederico Fleury Curado	2	3	–	–	3	5	1	–	–	4
Robyn Denholm ⁽¹⁾	2	2	6	–	–	–	–	–	–	–
Lars Förberg ⁽²⁾	–	–	–	–	–	5	1	–	4	–
Louis R. Hughes	2	3	7	–	–	5	2	7	–	–
David Meline	2	3	6	–	–	5	1	7	–	–
Satish Pai	2	3	6	–	–	5	1	7	–	–
Michel de Rosen ⁽¹⁾	2	3	–	–	3	–	–	–	–	–
Ying Yeh	2	3	–	–	3	5	1	–	–	4

(1) Robyn Denholm and Michel de Rosen stepped down from the Board in April 2017.

(2) Lars Förberg was first elected to the Board at the April 2017 AGM.

(3) One conference call Post Annual General Meeting 2017 was a mini board meeting attended just by the Chairman of the Board and the Chairman of the FACC to whom the Board had delegated authority.

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.

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. This determination has been made based on ABB Ltd's Related Party Transaction Policy. This policy is contained in the ABB Ltd Board Regulations & Corporate Governance Guidelines.

Sasol Ltd (Sasol) is an important customer of ABB. ABB supplies Sasol primarily with modular systems through its Electrification Products division. David Constable was president, chief executive officer and member of the board of Sasol until June 2016.

IBM Corporation (IBM) is an important supplier to ABB. IBM supplies ABB primarily with IT related hardware, software and services. Peter R. Voser is a director of IBM.

After reviewing the level of ABB's business with Sasol and the level of purchases from IBM, the Board has determined that ABB's business relationships with those companies are not unusual in their nature or conditions and do not constitute material business relationships. As a result, the Board concluded that all members of the Board are considered to be independent directors. This determination was made in accordance with ABB's Related Party Transaction Policy.

EXECUTIVE COMMITTEE

Composition of the executive committee

Ulrich Spiesshofer Chief Executive Officer		
<u>Corporate Officers</u>	<u>Division Presidents</u>	<u>Region Presidents</u>
Timo Ihamuotila Chief Financial Officer	Claudio Facchin Power Grids	Frank Duggan Europe
Jean-Christophe Deslarzes Chief Human Resources Officer	Tarak Mehta Electrification Products	Chunyuhan Gu Asia, Middle East & Africa
Diane de Saint Victor General Counsel	Peter Terwiesch Industrial Automation	Greg Scheu Americas
	Sami Atiya Robotics and Motion	

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, 2017):

Ulrich Spiesshofer was appointed Chief Executive Officer in September 2013 and has been a member of the Executive Committee since 2005. From January 2010 to September 2013, Mr. Spiesshofer was the Executive Committee member responsible for the Discrete Automation and Motion division. He joined ABB in November 2005, as the Executive Committee member responsible for Corporate Development. From 2002 until he joined ABB, he was senior partner and global head of operations practice at Roland Berger AG (Switzerland). From 1991 to 2002, he held various management positions with A.T. Kearney Ltd. and its affiliates. Mr. Spiesshofer was born in 1964 and is a Swiss and German citizen.

Timo Ihamuotila was appointed Chief Financial Officer and member of the Executive Committee in April 2017. From 2009 to 2016, Mr. Ihamuotila was the Chief Financial Officer and 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.

Jean-Christophe Deslarzes was appointed Chief Human Resources Officer and member of the Executive Committee in November 2013. In April 2015, he was elected to the board of directors of the Adecco Group (Switzerland). From 2010 through 2013, he was the Chief Human Resources and Organization Officer of the Carrefour Group (France). From 2008 to 2010 he was President and CEO of the Downstream Aluminum Businesses of Rio Tinto (Canada). He was Senior Vice President Human Resources of Alcan Inc. (Canada) from 2006–2008 and in addition he co-led the integration of Rio Tinto and Alcan from 2007 to 2008. From 1994 to 2006, he held various human resources and management roles with Alcan Inc. Mr. Deslarzes was born in 1963 and is a Swiss citizen.

Diane de Saint Victor was appointed General Counsel, Company Secretary and member of the Executive Committee in January 2007. She is also a member of the board of directors of the American Chamber of Commerce (France). From 2013 to 2017, she was a non-executive director of Barclays plc and Barclays Bank plc (both U.K.). From 2004 to 2006, she was general counsel of the Airbus Group (France/Germany). From 2003 to 2004, she was general counsel of SCA Hygiene Products (Germany). From 1993 to 2003, she held various legal positions with Honeywell International (France/Belgium). From 1988 to 1993, she held various legal positions with General Electric (U.S.). Ms. de Saint Victor was born in 1955 and is a French citizen.

Tarak Mehta was appointed President of the Electrification Products division effective January 2016 and has been a member of the Executive Committee since October 2010. 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. citizen.

Sami Atiya was appointed President of the Robotics and Motion Division effective January 2017 and has been a member of the Executive Committee since June 2016. 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 CEO 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.

Peter Terwiesch was appointed President of the Industrial Automation division effective January 2017 and has been a member of the Executive Committee since January 2015. He is a member of the board of directors of Metall Zug AG (Switzerland). He was the President of the Process Automation division from 2015 to 2016. From 2011 to 2014, Mr. Terwiesch was the 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 Swiss and German citizen.

Claudio Facchin was appointed President of the Power Grids division effective January 2016 and has been a member of the Executive Committee since December 2013. From December 2013 through December 2015, he was President of the Power Systems division. From 2010 to 2013, Mr. Facchin was head of ABB's North Asia region. From 2004 to 2009, Mr. Facchin was the head of ABB's substations global business unit and from 1995 to 2004, he held various management roles with ABB. Mr. Facchin was born in 1965 and is an Italian citizen.

Frank Duggan was appointed President of the Europe region in July 2017 and has been a member of the Executive Committee since 2011. From 2014 to June 2017, Mr. Duggan held the role of President of the Asia, Middle East and Africa region. Prior to this from 2011 to 2014, he was the head of Global Markets. From 2008 to 2014, he was also ABB's region manager for India, Middle East and Africa. From 2008 to 2011, he was ABB's country manager for the United Arab Emirates. Between 1986 and 2008, he held several management positions with ABB. Mr. Duggan was born in 1959 and is an Irish citizen.

Chunyuanyuan Gu was appointed President of the Asia, Middle East and Africa region in July 2017 and has been a member of the Executive Committee since July 2017. In addition, Mr. Gu has been the Managing Director of ABB China since 2014. From 2012 to 2013, he was the Regional Division Head of ABB's Discrete Automation and Motion for North Asia and China. From 2010 to 2011 he was the Head of ABB's Robotics Business Unit in China. Before this, Mr. Gu held various management and technical roles in ABB's Robotics business in China and Sweden. Mr. Gu was born in 1958 and is a Swedish citizen.

Greg Scheu was appointed President of the Americas region as well as Head of Group Service and Business Integration in January 2015 and has been a member of the Executive Committee since 2012. From 2013 to 2014, he was Head of Business Integration, Group Service and North America. From 2012 to 2013, he was Head of Marketing and Customer Solutions. Mr. Scheu, a former executive of Rockwell International, joined ABB in 2001 and was responsible for the integration of both Baldor Electric Co. and of Thomas & Betts into ABB. Mr. Scheu was born in 1961 and is a U.S. citizen.

Further information about the members of the Executive Committee can be found by clicking on the Executive Committee CV link at www.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.

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. This determination has been made based on ABB Ltd's Related Party Transaction Policy. This policy is contained in the ABB Ltd Board Regulations & Corporate Governance Guidelines.

Adecco S.A. (Adecco) is an important supplier to ABB. Adecco primarily supplies ABB with temporary personnel services. Jean-Christophe Deslarzes is a director of Adecco.

ABB has an unsecured syndicated \$2-billion revolving credit facility. As of December 31, 2017, Barclays Bank plc (Barclays Bank) had committed to approximately \$74 million out of the \$2-billion total. In addition, ABB has regular banking business with Barclays. Diane de Saint Victor was a director of Barclays Bank and Barclays plc until May 2017.

After reviewing the level of purchases from Adecco, and after reviewing the banking commitments of Barclays, the Board has determined that ABB's business relationships with those companies are not unusual in their nature or conditions and do not constitute material business relationships. This determination was made in accordance with ABB Ltd's Related Party Transaction Policy.

SHARES

Share capital of ABB

At December 31, 2017, ABB's ordinary share capital (including treasury shares) as registered with the Commercial Register amounted to CHF 260,177,791.68, divided into 2,168,148,264 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, 2017, ABB Ltd had a market capitalization based on outstanding shares (total number of outstanding shares: 2,138,606,489) of approximately CHF 56 billion (\$57 billion, SEK 471 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, 2017, 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 297 billion.

Stock exchange listings (At December 31, 2017)

Stock exchange	Security	Ticker symbol	ISIN code
SIX Swiss Exchange	ABB Ltd, Zurich, share	ABBN	CH0012221716
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

Under the share buyback program that ran from September 2014 to September 2016, ABB repurchased a total of 146,595,000 shares for cancellation. In 2016, 100 million shares were cancelled. At ABB's General Meeting of Shareholders in 2017, the shareholders approved the cancellation of 46.595 million shares. This was completed in July 2017. As a result of the share cancellation in 2017, the total number of ABB's Ltd's issued shares is 2,168,148,264.

Changes to the ordinary share capital

In 2017, ABB paid a dividend of 0.76 Swiss francs per share relating to the year 2016. In 2016, ABB paid its dividend relating to the year 2015 by way of a nominal value reduction in the par value of its shares from CHF 0.86 to CHF 0.12. Corresponding adjustments were made to the par value of ABB's contingent and authorized shares.

In 2015, ABB paid a portion of its dividend relating to the year 2014 by way of a nominal value reduction in the par value of its shares from CHF 1.03 to CHF 0.86. Corresponding adjustments were made to the par value of ABB's contingent and authorized shares.

Except for the share cancellation and nominal value reductions described above, there were no other changes to ABB's ordinary share capital during 2017, 2016, and 2015.

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, 2017, 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.

At December 31, 2017, 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. 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 Shareholders' section below).

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, 2017, 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. 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 Shareholders' section below).

Authorized share capital

At December 31, 2017, 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 April 13, 2019. 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.

SHAREHOLDERS

Shareholder structure

As of December 31, 2017, the total number of shareholders directly registered with ABB Ltd was approximately 118,000 and another 295,000 shareholders held shares indirectly through nominees. In total as of that date, ABB had approximately 413,000 shareholders.

Significant shareholders

Investor AB, Sweden, held 232,165,142 ABB shares as of December 31, 2017. This holding represents approximately 10.71 percent of ABB's total share capital and voting rights as registered in the Commercial Register on December 31, 2017. 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.

Cevian Capital II GP Limited, Channel Islands, disclosed that as of September 8, 2017, on behalf of its general partners, it held 115,868,333 ABB shares. This holding represents approximately 5.347 percent of ABB's total share capital and voting rights as registered in the Commercial Register on December 31, 2017.

BlackRock Inc., New York, U.S., disclosed that as of August 31, 2017, it, together with its direct and indirect subsidiaries, held 72,900,737 ABB shares. This holding represents 3.36 percent of ABB's total share capital and voting rights as registered in the Commercial Register on December 31, 2017.

At December 31, 2017, 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.

Under ABB's Articles of Incorporation, 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.

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.

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 two trading days after the shareholders' resolution and the ex-date for dividends is normally two 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 five 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 depository, 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 2017. 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 32 of the Swiss Stock Exchange and Securities Trading Act.

OTHER GOVERNANCE INFORMATION

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 and the Management Incentive Plan may be subject to accelerated vesting in the event of a change of control.

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 Management Incentive Plan and the Long Term Incentive Plan. For a more detailed description of these incentive plans, please refer to "Note 18 Share-based payment arrangements" to ABB's Consolidated Financial Statements.

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 governance

Shareholders' engagement

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 and Executive Committee. They can be found on ABB's Corporate governance Web site 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 of Directors who are elected individually by the shareholders at the Annual General Meeting (AGM) for a period of one year. The CC 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 available on ABB's Corporate governance Web site.
- 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.
- Credits (Article 37): Credits may not be granted to members of the Board or of the EC.

Shareholders also have a consultative vote on the prior year's Compensation report at the AGM. The Compensation report describes the compensation principles and programs as well as the governance framework related to the compensation of the Board and EC. The report also provides details of the compensation paid to the members of the Board and of the EC in the prior calendar year.

The Compensation report is written in accordance with the Ordinance against Excessive Remuneration in Stock Listed Corporations (Ordinance), the standard relating to information on Corporate Governance of the SIX Swiss Exchange, the rules of the stock markets of Sweden and the United States where ABB's shares are also listed, and the principles of the Swiss Code of Best Practice for Corporate Governance of economiesuisse.

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 1.

Compensation Exhibit 1: Authority levels in compensation matters

	CEO	CC	Board	AGM
Compensation policy including incentive plans	●	●	●	
Maximum aggregate compensation amount EC		●	●	●
CEO compensation		●	●	
Individual compensation EC members	●	●	●	
Performance target setting and assessment CEO		●	●	
Performance target setting and assessment EC	●	●	●	
Shareholding requirements CEO and EC		●	●	
Maximum aggregate compensation amount Board		●	●	●
Individual compensation of Board members		●	●	
Compensation report		●	●	Consultative vote
	● Proposal	● Recommendation	● Approval	

Activities of the CC in 2017

The CC meets as often as business requires but at least four times a year. In 2017, the CC held seven meetings and performed the activities described in Compensation Exhibit 2. Details on meeting attendance of the individual CC members are provided in the section titled “Board of Directors – Meetings and attendance” above.

Compensation Exhibit 2: CC activities during 2017

Performance: items relating to past performance cycle
Individual performance assessment of CEO and EC members
Performance assessment for short-term variable compensation
Payout of long-term variable compensation
Performance: items relating to upcoming performance cycle
Setting of performance targets for short-term variable compensation
Setting of performance targets for long-term variable compensation
Quarterly updates on status of various performance plans
EC compensation review and planning
Review of EC compensation (incentive structure, levels and mix) relative to external benchmarks
Specific review, in 2017, of the Long-Term Incentive Plan
Recommendation of individual compensation of EC members
Review of pensions and benefits
Review of shareholding level of each EC member
Board compensation
Comparison of compensation levels against external benchmarks
Recommendation of individual compensation of Board members
Compliance and regulatory
Preparation of Compensation report for publication
Preparation of maximum aggregate compensation amount of EC to be submitted to AGM vote
Preparation of maximum aggregate compensation amount of Board to be submitted to AGM vote

The Chairman of the CC reports to the full Board after each CC meeting. The minutes of the meetings are available to the members of the Board. As a general rule, the CEO, the Chief Human Resources Officer (CHRO) and the Head of Compensation and Benefits attend 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.

The CC may decide to consult external advisors for compensation matters. In 2017, Hostettler & Company (HCM) and PricewaterhouseCoopers (PwC) were mandated to provide services related to executive compensation matters. HCM has no other mandate with ABB. Apart from its CC advisory role, PwC also provides human resources, tax and advisory services to ABB.

Total compensation overview

Compensation Exhibit 3: Board compensation (in CHF)

Board of Directors	Board term	
	2017–2018	2016–2017
Number of members	10	11
Total compensation	4,340,000	4,670,000
Maximum aggregate compensation amount approved at AGM	4,400,000	4,700,000

Compensation Exhibit 4: EC compensation (in CHF)

Executive Committee	Calendar year	
	2017	2016
Number of members	11	11
Total compensation	46,631,207 ⁽¹⁾	44,200,719
Maximum aggregate compensation amount approved at AGM	50,000,000	52,000,000

(1) This amount includes CHF 2,553,435 for the fair value of the replacement share grant provided to the incoming CFO to compensate for benefits foregone from his previous employer. Excluding this, the total would have been CHF 44,077,772.

Board compensation

Policy and principles

The compensation system for the members of the Board is designed to attract and retain experienced people in the Board. Compensation of Board members takes into account the responsibilities, time and effort required to fulfill their roles on the Board and its committees. From time to time, the levels and mix of compensation of Board members are compared against the compensation of non-executive board members of publicly traded companies in Switzerland that are part of the Swiss Market Index.

The compensation of Board members is fixed. They do not receive variable compensation or pension benefits, underscoring their focus on corporate strategy, supervision and governance. In accordance with Swiss law, Board members may not receive golden parachutes or other special benefits in the event of a change of control. Board members are paid for their service over a 12-month period that starts with their election at the AGM. Payment is made in semi-annual installments in arrears.

In order to further align the interests of the Board members with those of ABB's shareholders, half of their total compensation must be paid in ABB shares, although Board members may choose to receive all of their compensation 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.

Structure of Board compensation

The structure of Board compensation for the term of office from AGM to AGM is described in Compensation Exhibit 5 below.

Compensation Exhibit 5: Structure of Board compensation

	Board term fee (CHF)
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 for their roles on the GNC.

(2) CC: Compensation Committee,

FACC: Finance, Audit & Compliance Committee,

GNC: Governance & Nomination Committee.

The compensation amounts paid to the Board members for the calendar year 2017 and for the term of office from the 2017 AGM to the 2018 AGM are disclosed in Compensation Exhibits 20 and 21, respectively, in the section “Compensation and share ownership tables.”

Compensation of the Board in 2017

In 2017, the total compensation for the Board members was CHF 4.5 million compared with CHF 4.2 million in 2016. The increase was due to the increase in the size of the Board. See Compensation Exhibit 20 in the section “Compensation and share ownership tables” below.

At the 2016 AGM, the shareholders approved a maximum aggregate compensation amount of CHF 4.7 million for the Board for the term of office 2016–2017. The compensation paid for that period amounts to CHF 4.67 million as presented in Compensation Exhibit 3 above and Compensation Exhibit 21 in the section “Compensation and share ownership tables” below, and is therefore within the approved amount.

At the 2017 AGM, the shareholders approved a maximum aggregate compensation amount of CHF 4.4 million for the Board for the term of office 2017–2018. The compensation paid for that period amounts to CHF 4.34 million as presented in Compensation Exhibit 3 above and Compensation Exhibit 21 in the section “Compensation and share ownership tables” below, and is therefore within the approved amount.

Shareholdings of Board members

The members of the Board collectively owned less than 1 percent of ABB’s total shares outstanding at December 31, 2017.

Compensation Exhibit 22 in the section “Compensation and share ownership tables” below, shows the number of ABB shares held by each Board member at December 31, 2017 and 2016. 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.

In 2017, 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. Except as disclosed in the section titled “Board of Directors — Business relationships between ABB and its Board members” above, ABB did not pay any additional fees or compensation in 2017 to persons closely linked to a member of the Board for services rendered to ABB.

Compensation of former Board members

In 2017, no payment was made to any former Board member.

Executive Committee compensation

Policy and principles

ABB's compensation system reflects the commitment to attract, motivate and retain people with the talent necessary to strengthen ABB's position as a global pioneering technology leader for utility, industry, and transport & infrastructure customers.

The compensation system is designed to provide competitive compensation and to encourage executives and employees to deliver outstanding results and create sustainable shareholder value without taking excessive risks. The compensation system balances:

- fixed and variable compensation elements;
- short-term and long-term incentives;
- the recognition of Group and individual performance.

ABB continues to increase the performance orientation of its compensation system to better align it to the Company's Next Level strategy (NLS) by having performance metrics that support the development of earnings per share (EPS) and cash return on invested capital (CROI).

Structure of EC Compensation

Overall positioning of compensation

The compensation of EC members consists of an annual base salary, standard benefits, a short-term variable component based on annual performance objectives and a long-term variable component based on long-term performance.

The Board considers several factors when reviewing and setting the individual target compensation of each EC member:

- market value of the role (external benchmark);
- individual profile of the incumbent in terms of experience and skillset;
- individual performance and potential;
- affordability for the company.

All EC and other senior positions of ABB have been evaluated using the job evaluation methodology of the Hay Group which is used by more than 10,000 companies around the world. This approach provides a meaningful, transparent and consistent basis for evaluating roles and for comparing compensation levels with those of equivalent jobs at other companies.

The primary source of data to assess the EC compensation is the General Pan-European Market of Hay's annual survey "Top Executive Compensation in Europe". The EC compensation is benchmarked against the median to upper quartile values. We also use Hay's data on Swiss and U.S. peers as well as a global industry peer group (see Compensation Exhibit 6).

Compensation Exhibit 6: Compensation benchmarks

REFERENCE	COMPOSITION	RATIONALE
Main benchmark		
Hay General Pan-European Market	360 largest European companies of the FT Europe 500 listing	Continuity and stability of data points
References to stress-test main benchmark		
Global industry group	Peer companies ⁽¹⁾ selected based on business, geographic presence and size	Specific peer group to benchmark compensation design
Swiss market	SMI and SMIM companies that are included in Hay's General Pan-European Market data	Comparison with other multinational Swiss companies
U.S. market	U.S. peers of similar size and industry	Comparison with other multinational U.S. companies

(1) The peers for the purpose of benchmarking compensation design are: Siemens, Schneider Electric, Legrand, Alstom, Atlas Copco, CNH Industrial, ThyssenKrupp, BAE systems, Rolls Royce, Linde, BASF, EADS, Schindler, Novartis, Nestlé, Holcim, General Electric, 3M, Honeywell, Caterpillar, Emerson Electric, Eaton, Danaher and United Technologies.

The compensation that is ultimately paid depends on the performance of the Group and of the individual members of the EC.

Compensation structure – overview

Our compensation structure is linked to our strategy and, as illustrated in Compensation Exhibits 7 and 17, a significant portion of total compensation depends directly on performance achievement. Our fully performance-oriented Long-Term Incentive Plan (LTIP) plan and the high shareholding requirement are aligned to shareholder interests.

Compensation Exhibit 7: Structure of EC compensation in 2017

Compensation structure	Fixed compensation-annual base salary and benefits	Short-term variable compensation	Long-term variable compensation	Shareholding requirement
Purpose and link to strategy	Compensates EC members for the role	Rewards annual company and individual performance. Drives annual strategy implementation	Encourages creation of long-term, sustainable value for shareholders, and delivery of long-term strategic goals	Aligns individual's personal wealth at risk directly to the ABB share price
Operation	Cash salary, benefits in kind, and pension contribution	Annual awards, payable in cash after a 1-year performance period	Annual awards in shares which vest after 3 years subject to performance conditions	Individuals required to hold ABB shares
Opportunity/exposure value (as % salary)	Based on scope of responsibilities, individual experience and skillset	CEO Target: 150% Maximum: 225% EC: Target: 100% Maximum: 150%	CEO Target at grant: 200% EC Target at grant: 107%	CEO wealth at risk: 500% EC wealth at risk: 400%
Time period	Delivered in year	1 year	3 years	Total EC tenure
Performance measures	Changes to base salary takes into account the executive's performance in the preceding year and potential for the future	Group objectives: Revenue, Op. EBITA %, Op. net income, OCF, Cost Savings, Service Orders. Individual objectives	Net operating income (50%) EPS (50%)	Direct link to ABB share price

Fixed compensation – annual base salary and benefits

Purpose and link to strategy

- Compensates the EC members for the role.

Operation

- Fixed annual base salary and benefits.
- Benefits consist mainly 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.
- Benefit plans vary in line with the local competitive and legal environment and are, at a minimum, in accordance with the legal requirements of the respective country.
- EC members may also be provided with certain benefits according to competitive local market practice. Tax equalization is provided for EC members resident outside Switzerland to the extent that they are not able to claim a tax credit in their country of residence for income taxes they paid in Switzerland.

Opportunity level

- Annual base salary based on the scope of responsibilities, individual experience and skillset.
- The monetary value of benefits is disclosed in Compensation Exhibit 23: EC compensation 2017.

Performance measures

- When considering changes in base salary, the executive's performance during the preceding year against individual objectives as well as potential for the future are taken into account.

Short-term variable compensation

Purpose and link to strategy

- The short-term variable compensation is designed to reward EC members for the Group's results and their individual performance over a time horizon of one year. It allows the EC members to participate in the company's success while being rewarded for their individual contributions.

Operation

- Annual cash awards are based on performance assessment over the given year.

Opportunity level

Compensation Exhibit 8: Opportunity level (% salary)

	Target	Maximum
CEO	150%	225%
EC	100%	150%

Performance measures

Group objectives (see Compensation Exhibit 9) are set in connection with the annual performance management process and are mainly group financial result oriented.

Compensation Exhibit 9: Group objectives and weighting in 2017

Objective	Weighting	Nature of assessment
Revenues	20%	Income realized from executing and fulfilling customer orders, before any costs or expenses are deducted
Operational EBITA margin	15%	Operational EBITA margin is Operational EBITA (as defined in Note 23 to the Consolidated Financial Statements) as a percentage of Operational revenues, which is total revenues adjusted for foreign exchange/commodity timing differences in total revenues
Operational net income	10%	Operational net income is calculated as net income attributable to ABB adjusted for the after-tax effect of acquisition-related amortization, restructuring and restructuring-related expenses, non-operational pension cost, changes in retained obligations of divested businesses, changes in pre-acquisition estimates, gains and losses from sale of businesses, acquisition-related expenses and certain non-operational items, foreign exchange/commodity timing differences in income from operations
Operating cash flow (OCF)	30%	Operating cash flow is defined as the net cash provided by operating activities, reversing the cash impact of interest, taxes and restructuring-related activities
Cost savings	15%	Savings generated from ABB group-wide cost reduction programs covering Supply Chain Management, Operational Excellence and White Collar Productivity that have direct impact on the Group's Operational EBITA
Service Orders	10%	Orders received relating to the service business

Individual objectives are set as part of the annual performance management process and support the implementation of the NLS in the respective area of responsibility of each EC member. They include metrics that help the management assess whether the results are achieved in a sustainable way in four different categories: financial performance, operational performance, strategic initiatives and leadership performance.

For each performance objective (group and individual), a target is set corresponding to the expected level of performance that will generate a 100 percent payout. Further, a minimum level of performance, below which there is no payout (threshold) and a maximum level of performance, above which the payout is capped at 150 percent of the target (cap), are also defined. The payout percentages for achievements between the threshold, the target and the cap are determined by linear interpolations between these points.

Compensation Exhibit 10: Weight of Group and individual objectives for EC members for 2017

	CEO	Division and region presidents	Corporate Officers⁽¹⁾
Group objectives	80%	35%	50%
Individual objectives	20%	(divisional/regional and personal objectives)	(functional and personal objectives)

(1) CFO, CHRO and General Counsel.

Long-term variable compensation

Purpose and link to strategy

Aimed at driving long-term shareholder value creation in a sustainable manner. It rewards the achievement of predefined performance goals over a three-year vesting period.

Operation

- Annual conditional share grant under the LTIP.
- Two equally weighted performance components, one tied to ABB's net operating income and one to ABB's EPS.

- Reference value defined as a percentage of base salary.

Compensation Exhibit 11: Reference value (% of annual base salary)

	Net operating income component (P1)	EPS component (P2)	Total
CEO	100%	100%	200%
EC	53.5%	53.5%	107%

- The reference value for the grant size of the net operating income component for the CEO as an individual and the other EC members as a pool may be increased or decreased by the Board by up to 25 percent.
- Number of shares granted is determined by dividing reference value by average share price in the 20 days prior to grant.
- Award vests after three years subject to achievement of performance conditions, defined prior to grant.
- Delivery is 70 percent in shares and the remainder in cash, with the possibility to elect to receive 100 percent in shares.
- Subject to malus and clawback rules if a plan participant has been involved in any illegal activity. This means that the Board of Directors may decide not to pay any unpaid or unvested incentive compensation (malus), or may seek to recover incentive compensation that has been paid in the past (clawback).

Performance measures

- **Net operating income – payout vs. performance**
The actual achievement level is determined by comparing ABB’s average income from continuing operations, net of tax, relative to budget, over three financial years beginning with the year in which the award was granted. The Board determines an appropriate threshold below which there will be no payout as well as a maximum above which payout will be capped at 150 percent.
- **EPS – payout vs. performance**
Weighted cumulative earnings per share - Performance targets are set using an outside-in view, taking into account the growth expectations, risk profile, investment levels and profitability levels that are typical for the industry. This outside-in approach in setting EPS objectives for the LTIP, is provided by external advisors and assumes that investors expect a risk-adjusted return on their investment, which is based on market value (and not book value) and translates such expected returns over a three-year period into EPS targets.

The weighted cumulative EPS result is calculated as the addition of the EPS in the first financial year (weighted at 33 percent) plus the EPS in the second financial year (weighted at 67 percent) plus the EPS in the third financial year (weighted at 100 percent). This formula gives more weight to the EPS achieved in the later years of the vesting period. There is no payout if the lower EPS threshold is not reached and the payout is capped at 200 percent if EPS performance exceeds the predefined payout cap.

Shareholding requirement

Purpose and link to strategy

- To align EC members’ interests with those of shareholders in order to maintain focus on the long-term success of the company.

Operation

- EC members are required to build up a holding of ABB shares that is equivalent to a multiple of their annual base salary (see Compensation Exhibit 12).
- These shareholding requirements are significantly above market practice and result in a wealth at risk for each EC member which is aligned with shareholder interests (see Compensation Exhibit 27).

Compensation Exhibit 12: Shareholding requirement level

CEO	5 × annual base salary
Other EC members	4 × annual base salary

- Only shares owned by an EC member and the member's spouse are included in the share ownership calculation. Vested and unvested stock options are not considered for this purpose.
- 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. As the level of the shareholding requirement is high relative to market practice, the Board has determined that members of the EC should generally aim to reach these multiples within five years of their appointment.

Notice period, severance provisions and non-competition clauses

Operation

Employment contracts for EC members include a notice period of 12 months, during which they are entitled to their base salary, benefits and short-term variable compensation. 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 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 compensation.

Compensation of the Executive Committee in 2017

Compensation Exhibit 13: Total compensation of EC members (in CHF million)

	2017	2016
Base salaries	10.0	10.2
Pension benefits	4.7	4.1
Other benefits	5.1	5.2
Total fixed compensation	19.8	19.5
Short-term variable compensation	10.4	11.4
Long-term variable compensation	13.8	13.3
Replacement Share Grant	2.6	–
Total variable compensation	26.8	24.7
Total compensation	46.6	44.2

For an overview of compensation by individual and component, please refer to Compensation Exhibit 23 and Compensation Exhibit 24 in "Compensation and share ownership tables" below.

Overall positioning of compensation

The ratio of fixed to variable components in any given year depends on the performance of the individuals and of the company against predefined performance objectives.

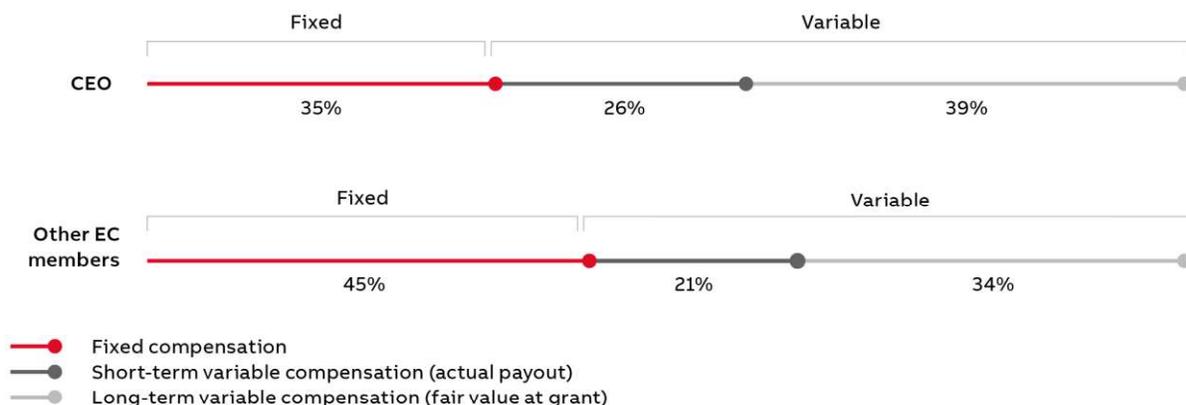
In 2017, as shown in Compensation Exhibit 14, below, the variable compensation represented 65 percent of the CEO's compensation (previous year: 67 percent) and an average of 55 percent for the other EC members (previous year: 53 percent). This again illustrates the significant emphasis placed on performance-related compensation.

EC members received total compensation of CHF 46.6 million in 2017 compared with CHF 44.2 million in 2016, as presented in Compensation Exhibits 23 and 24.

The change in total compensation in 2017 is principally due to the one-time replacement share grant for the CFO, representing compensation for foregone benefits from his previous employer.

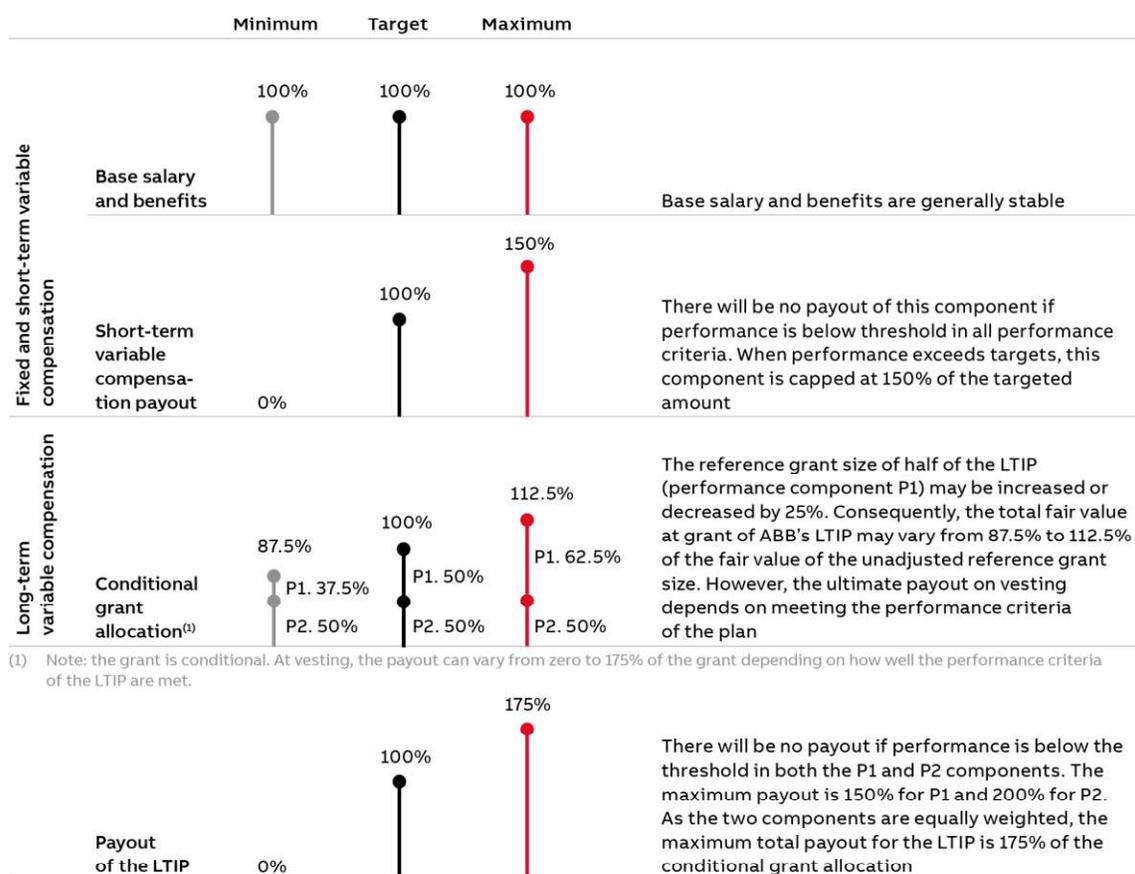
At the 2016 AGM, the shareholders approved a maximum aggregate compensation amount of CHF 50.0 million for the EC for the year 2017. The EC compensation for 2017 amounted to CHF 46.6 million and, despite having changes to the EC composition, is still within the approved amount.

Compensation Exhibit 14: Ratios of fixed and variable compensation components of EC members in 2017



Compensation Exhibit 15: Compensation components under various scenarios

Exhibit 15: Compensation components under various scenarios



2017 short-term variable compensation

2017 has been a steady year for ABB. Revenues, with a weight of 20 percent, were on target with good contributions from both the Electrification Products and Robotics and Motion divisions. The payout of this parameter amounted to 99.8 percent.

Operational EBITA margin, with a weighting of 15 percent, and operational net income with a weighting of 10 percent, were below the targets with both measures reflecting significant operational charges recorded in the EPC businesses. The payout of the Operational EBITA margin parameter was 85.4 percent and the payout of the operational net income parameter was 86.0 percent.

Operating cash flow, with a weighting of 30 percent, although broadly stable when compared with 2016, was slightly behind the target set for 2017. The payout of this parameter was 88.1 percent.

The Group delivered strong operational cost savings, almost on target, while service orders, despite growing compared with 2016, did not reach the 2017 target. The cost savings parameter, weighted at 15 percent, achieved a 99.5 percent payout, while the service orders parameter, weighted at 10 percent, achieved a 92.3 percent payout.

The effects of major business portfolio changes, including the newly acquired B&R business, are excluded from the above performance assessment. The combined achievement of these performance measures resulted in a 91.9 percent achievement level for the group scorecard in 2017.

With respect to individual/team objectives for each EC member, the achievement ranges between 75 percent and 122 percent, reflecting the financial results of their respective areas of responsibility as well as their achievements on operational performance, strategic initiatives and leadership performance. This resulted in an overall payout of the short-term incentives for the entire EC at 96 percent with a range of 81 percent (lowest achievement) and 107 percent (highest achievement).

2017 long-term variable compensation

In 2017, the estimated value of the share-based grants to EC members under the LTIP was CHF 13.8 million compared with CHF 13.3 million in 2016.

2014 LTIP outcome

The payout for the performance component of the 2014 LTIP that vested in 2017 was 37 percent (previous year: 43 percent for the 2013 LTIP). The payout was based on the cumulative weighted EPS achieved during the plan's three-year vesting period. The retention component vested fully, conditional on continued employment (see Compensation Exhibit 16).

The 2014 LTIP was the final LTIP that comprised a retention component and a performance component. LTIPs launched from 2015 onwards comprised P1 and P2 components. The Board also recognized the need for increased performance orientation and transparency and has conducted a comprehensive review of the LTIP for implementation starting from the 2018 grant.

Compensation Exhibit 16: LTIP 2014 objectives and actual vesting percentages

Objective	Performance			
	Below threshold	Threshold to target	Target	Target to maximum
Performance component		37%		
Retention component	N/A	N/A	100%	N/A

Outlook for 2018: continuing to increase performance orientation of ABB's compensation system

Over recent years, ABB has progressively increased the performance orientation of its compensation system while better aligning it to the Company's NLS and including inputs from shareholders and other stakeholders.

In the Compensation Exhibit 17 we detail the key developments to remuneration since our NLS was announced in September 2014, leading to the changes the Board plans to implement in 2018.

The main considerations in making the changes over the years have been to ensure that:

- There is a performance linkage in every pay component.
- Total compensation levels remain competitive within market benchmarks as we increase the performance orientation.
- The improvements are carefully phased to allow for similar changes following the same principles to be cascaded throughout the organization.

The initial focus of these changes was on base compensation, in order to put more emphasis on the executive's performance and potential appraisal, and on short-term incentives, to increase personal accountability by increasing the weight of individual and own team scorecards to 65 percent. More recently, the focus has shifted to increasing the performance orientation of long-term incentives as we changed our LTIP from having a retention component, weighted at approximately 60 percent in 2014, to the present fully performance oriented LTIP.

Highlights for the 2018 improvements are:

- No changes to the structure of fixed pay. The changes to the system of pension contributions have now been completed and there are no further adjustments to the system of pensions planned.
- There are minor revisions to the design of the short-term variable compensation elements since they have been progressively reviewed and improved over the last three years. The changes for 2018 are targeted at streamlining the weighting of Group metrics versus individual/team metrics to a consistent 35 percent/65 percent for all EC members (except for the CEO, who remains at 80 percent/20 percent).
- A comprehensive review of our LTIP was undertaken in 2017, leading to the changes the Board now plans to implement in 2018. These changes make our LTIP simpler and easier to communicate. With a single plan and two performance measures of EPS and relative Total Shareholder Return (TSR), our LTIP is now fully aligned with our NLS, which focuses on EPS delivery and attractive shareholder returns, both on an absolute and relative basis. In line with our commitment to improved transparency, we will disclose our LTIP peer group in our 2018 compensation report, after the revised plan is launched.
These changes have been introduced so that the fair value of total compensation for EC members is kept at the same level.
- The share ownership requirement for the EC remains among the highest in the market. We are now requiring that EC members retain all shares vested from the Company's LTIP programs until his or her share ownership requirement is met. This arrangement is more stringent and transparent, compared to the previous requirement where an EC member was expected to reach his or her share ownership within 5 years of EC tenure based on an expected ABB share price development. We have also clarified the basis of the shareholding requirement as being a multiple of annual base salary, net of tax.

Shareholdings of EC members

The EC members owned collectively less than 1 percent of ABB's total shares outstanding at December 31, 2017.

At December 31, 2017, members of the EC held ABB shares and conditional rights to receive shares, as shown in Compensation Exhibit 27 in the section "Compensation and share ownership tables" below. Their holdings at December 31, 2016, are shown in Compensation Exhibit 28 in the section "Compensation and share ownership tables" below.

Members of the EC cannot participate in the Management Incentive Plan (MIP). Any MIP instruments held by EC members were awarded to them as part of the compensation they received in previous roles they held at ABB. For a more detailed description of MIP, please refer to “Note 18 Share-based payment arrangements” to our Consolidated Financial Statements.

Except as described in Compensation Exhibits 27 and 28, 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, 2017 and 2016.

Compensation Exhibit 17: Detailed summary of Compensation structure over time.

Compensation area	Status in 2014	Evolution over the last 3 years	Going forward from 2018
Annual base salary	<ul style="list-style-type: none"> Benchmarked against Hay Group's Pan-European Top Executive Market, with consideration given to Hay's data on Swiss and U.S. peers as well as a global industry peer group. Annual salary increases are approved by the Board based on the CEO's assessment of the individual EC member's performance and potential⁽¹⁾ 	<ul style="list-style-type: none"> Remained consistent with same benchmarks Announced clear statement that annual base salaries of the EC will be benchmarked between the market median and upper quartile in order to attract suitable talent Clarified the use of the Swiss and U.S. market benchmarks as well as the Global industry group for benchmarking compensation design Stronger emphasis placed on assessment of performance and potential 	<ul style="list-style-type: none"> Pay levels are assessed annually against market competitive benchmarking using the peer groups described in Compensation Exhibit 6 No changes envisaged Disclosure of Global industry group (already in this report). See Compensation Exhibit 6 footnote (1)
Short-term variable compensation	<ul style="list-style-type: none"> Payout solely dependent on the achievement of Company performance objectives Board had authority to approve a higher than target payout if an objective was exceeded 	<ul style="list-style-type: none"> Significant performance alignment introduced with objectives set in financial, operational, change and leadership areas in line with NLS Payout dependent on achievement of both Company and Individual/Team performance with balance between Group and Individual/Team shifted from 100%/0% to 65%/35% to 35%/65% (Corporate EC members to 50%/50%) CEO from 100%/0% to 80%/20% A mathematical computation replaces the Board "discretion" for payout computation if an objective exceeds target 	<ul style="list-style-type: none"> Strong performance alignment continues, stronger emphasis on earnings and operational excellence Payout dependent on achievement of both Company and Individual/Team performance Balance between Group and Individual/Team will be consistently 35%/65% for all EC members and 80%/20% for the CEO Individual objectives are set as part of the annual performance management process and support the implementation of the NLS in the respective areas of responsibility of each EC member Opportunity levels will be as follows: <ul style="list-style-type: none"> 0% payout at or below threshold 100% payout at target 150% payout at or above maximum <p>Payout is interpolated for achievement in between points</p>
Long-term variable compensation	<ul style="list-style-type: none"> LTIP comprises a retention component (with no vesting performance measure) and a performance component (vesting assessed on a cumulative weighted EPS⁽²⁾ measure) Balance is approximately 60% retention and 40% performance Retention component was share-settled for 70% and cash-settled for 30% (to assist in meeting tax payment obligations) with an option for a 100% share-settlement. Performance component was cash-settled only Board had authority to vary the pool size of the retention component by +/- 25% based on a look back assessment of how ABB performed on various disclosed measures against a set of peers Board had authority, based on CEO recommendation, to vary individual grant size to reflect personal performance and contribution to the Company⁽¹⁾ 	<ul style="list-style-type: none"> A two-tier performance was introduced with vesting of the P1 component based on a Net Operating Income measure and the P2 component on a cumulative weighted EPS⁽²⁾ measure; the Net Operating Income measure further evolved in 2017 from a binary "threshold" criteria (pay or no pay) to a payout based on a payout curve for various achievement levels Balance shifted to 50% P1 and 50% P2 Both P1 and P2 components were share-settled for 70% and cash-settled for 30% (to assist in meeting tax payment obligations) with an option for a 100% share-settlement "Look-back" assessment removed to reinforce forward-looking incentive with assessment at vesting 	<ul style="list-style-type: none"> Performance alignment to the NLS will further be strengthened A single, simplified performance driven LTIP will be introduced with two equally weighted performance measures to assess vesting payout: <ul style="list-style-type: none"> average EPS⁽³⁾ to focus on the Company's strategic plan; and relative Total Shareholder Return (TSR) against a peer group Inclusion of TSR element gives specific focus on an external market perspective Composition of peer group for relative TSR assessment will be disclosed in the next Compensation report following the initial grant The opportunity levels under the LTIP will be as follows: <ul style="list-style-type: none"> 0% payout at or below threshold 100% payout at target 200% payout at or above maximum Payout will be interpolated for achievements in between points Payout will be share-settled for 65% and cash-settled for 35% (cash settlement increased to 35% to be more in line with tax rates). Option for 100% share-settlement remains unchanged
Share ownership requirements	<p>Our share ownership requirements have been significantly above market practice:</p> <ul style="list-style-type: none"> 5 years of annual gross base salary for the CEO and 4 years for EC members Expected to reach requirement within 5 years of EC tenure and review is based on expected share price developments 	<ul style="list-style-type: none"> No changes made 	<p>Remains above market practice. The following ownership requirements will be enforced:</p> <ul style="list-style-type: none"> 5 years of annual net base salary for the CEO and 4 years for EC members (based on a 35% tax rate) No disposal of shares vesting from the Company's LTIP programs until the ownership requirements are met

(1) For the CEO, this will be based on the recommendation of the Chairman of the Board.

(2) Cumulative weighted EPS: 33 percent of EPS year 1 + 66 percent of EPS year 2 + 100 percent of EPS year 3; EPS target is based on external investors' expectations.

(3) This is a simple average EPS over years 1 to 3; the EPS target continues to be based on external investors' expectations.

Other compensation

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. Seven members of the EC participated in the 14th annual launch of the plan in 2017. EC members who participated will, upon vesting, each be entitled to acquire up to 380 ABB shares at CHF 26.26 per share, the market share price at the start of the 2017 launch.

For a more detailed description of ESAP, please refer to “Note 18 Share-based payment arrangements” to our Consolidated Financial Statements.

In 2017, 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 titled “Board of Directors — Business relations between ABB and its EC members” above, ABB did not pay any additional fees or compensation in 2017 to persons closely linked to a member of the EC for services rendered to ABB.

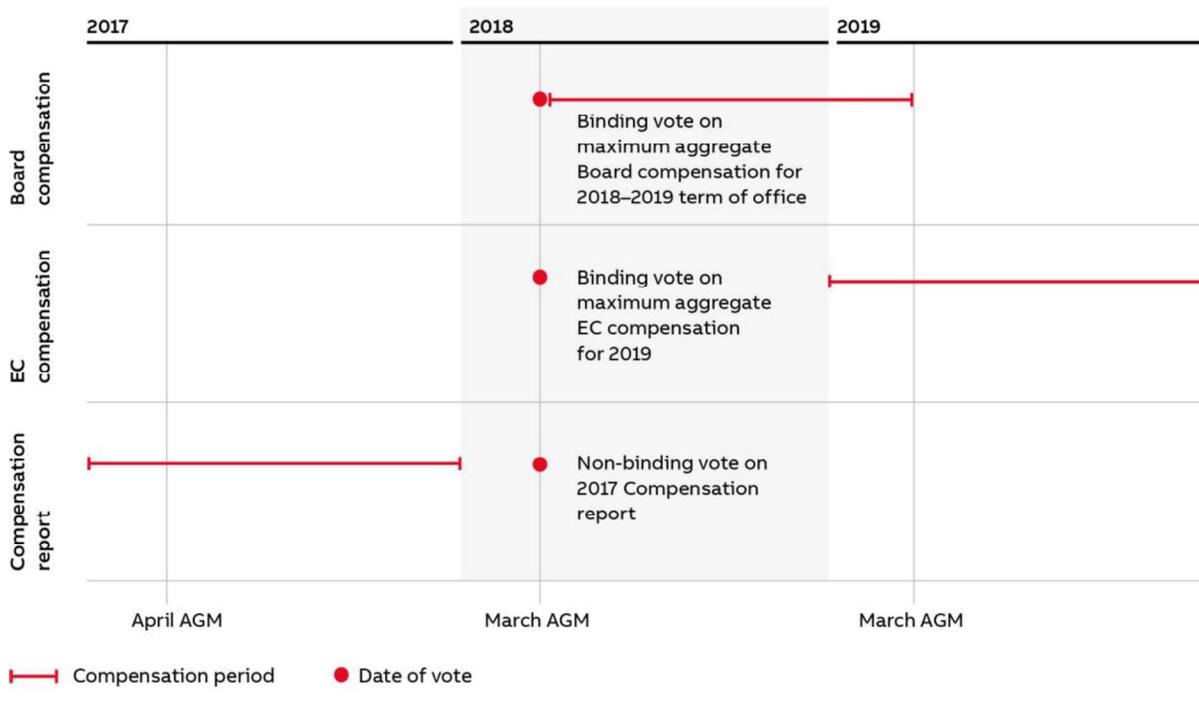
Compensation of former EC members

In 2017, certain former EC members received contractual compensation for the period after leaving the EC, as shown in Compensation Exhibit 23, footnote (6).

Votes on compensation at the 2018 AGM

As illustrated in Compensation Exhibit 18, the Board’s proposals to shareholders at the 2018 AGM will relate to Board compensation for the 2018–2019 term of office and EC compensation for the calendar year 2019. There will also be a non-binding vote on the 2017 Compensation report.

Compensation Exhibit 18: Shareholders will have three separate votes on compensation at the 2018 AGM



In determining the proposed maximum aggregate EC compensation, the Board takes into consideration the criteria illustrated in Compensation Exhibit 19. Given the variable nature of a major portion of the compensation components, the proposed maximum aggregate EC compensation will almost always be higher than the actual payout, as it must cover the potential maximum value of each component of compensation.

Compensation Exhibit 19: Overview of key factors affecting the determination of maximum aggregate EC compensation

	2017	2018	2019 ⁽¹⁾		
Aggregate EC compensation in CHF (millions)	47 44 ⁽³⁾	43	50 52	xx	
Assumptions	Actual	Target	Maximum (approved at 2016 AGM)	Maximum (approved at 2017 AGM)	Maximum (to be requested at 2018 AGM)
Short-term variable compensation payout percentage ⁽²⁾		100%	150%	150%	150%
Adjustment of LTIP grant size		0%	+12.5% ⁽⁴⁾	+12.5% ⁽⁴⁾	+12.5%
Number of EC members		11	11	11	11

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

(2) For full description, see section "Executive Committee compensation" and section "Outlook: changes to compensation system for 2018."

(3) Excluding one-time share grant for incoming CFO as replacement of benefits foregone from his previous employer.

(4) This 12.5 percent applied on the entire LTIP is equivalent to 25 percent applied to the P1 component in the design of the 2017 LTIP.

The Board's proposal for maximum aggregate EC compensation for 2019 will incorporate assumptions for a normal increase in compensation.

Compensation and share ownership tables

Compensation Exhibit 20: Board compensation in 2017 and 2016

Name	Paid in 2017					Paid in 2016				
	November Board term 2017-2018		May Board term 2016-2017		Total compensation paid in 2017 ⁽³⁾	November Board term 2016-2017		May Board term 2015-2016		Total compensation paid in 2016 ⁽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	CHF	CHF	CHF	
Peter Voser, Chairman ⁽⁴⁾	—	24,427	—	24,602	1,200,000	—	25,960	—	30,618	1,200,000
Jacob Wallenberg ⁽⁵⁾	112,500	3,684	112,500	3,709	450,000	112,500	3,915	112,500	4,616	450,000
Roger Agnelli ⁽⁶⁾	—	—	—	—	—	—	—	80,834	2,804	161,667
Matti Alahuhta ⁽⁷⁾	80,000	2,619	80,000	2,637	320,000	80,000	2,784	90,000	3,693	340,000
David Constable ⁽⁸⁾	87,500	2,865	80,000	2,637	335,000	80,000	2,784	80,000	3,282	320,000
Frederico Curado ⁽⁹⁾	80,000	2,423	80,000	2,443	320,000	80,000	2,573	—	—	160,000
Robyn Denholm ⁽¹⁰⁾	—	—	82,500	2,397	165,000	82,500	2,871	—	—	165,000
Lars Förberg ⁽¹¹⁾	—	6,494	—	—	160,000	—	—	—	—	—
Louis R. Hughes ⁽¹²⁾	100,000	3,274	100,000	3,297	400,000	100,000	3,480	100,000	4,103	400,000
David Melinc ⁽¹³⁾	82,500	2,701	82,500	2,720	330,000	82,500	2,871	—	—	165,000
Satish Pai ⁽¹⁴⁾	82,500	2,499	82,500	2,519	330,000	82,500	2,871	—	—	165,000
Michel de Rosen ⁽¹⁵⁾	—	—	87,500	2,642	175,000	87,500	3,045	87,500	3,590	350,000
Ying Yeh ⁽¹⁶⁾	80,000	2,462	80,000	2,475	320,000	80,000	2,616	81,666	3,145	323,333
Total	705,000	53,448	867,500	52,078	4,505,000	867,500	55,770	632,500	55,851	4,200,000

(1) Represents gross amounts paid, prior any deductions such as social security and withholding tax.

(2) Number of shares per Board member is calculated based on net amount due after all applicable deductions including social security and withholding tax.

(3) In addition to the Board remuneration stated in the above table, the Company paid CHF 103,006 and CHF 347,691, in 2016 and 2017, respectively, for related social security payments.

(4) Chairman of the ABB Ltd Board and Chairman of the Governance & Nomination Committee for the 2015-2016, 2016-2017 and 2017-2018 Board terms; elected to receive 100 percent of his gross compensation in the form of ABB shares.

(5) Vice-Chairman of the ABB Ltd Board and member of the Governance & Nomination Committee for the 2015-2016, 2016-2017 and 2017-2018 Board terms; elected to receive 50 percent of his gross compensation in the form of ABB shares.

(6) Member of the Finance, Audit & Compliance Committee for the 2015-2016 Board term; elected to receive 50 percent of his gross compensation in the form of ABB shares; died in a tragic accident in March 2016.

(7) Member of the Governance & Nomination Committee for the 2015-2016, 2016-2017 and 2017-2018 Board terms; Member of the Finance, Audit & Compliance Committee for the 2015-2016 Board term; elected to receive 50 percent of his gross compensation in the form of ABB shares.

(8) Chairman of the Compensation Committee for the 2017-2018 Board term; Member of the Compensation Committee for the 2015-2016 and 2016-2017 Board terms; elected to receive 50 percent of his gross compensation in the form of ABB shares.

(9) Elected as new Board member at the ABB Ltd 2016 AGM; Member of the Compensation Committee for the 2016-2017 and 2017-2018 Board terms; elected to receive 50 percent of his gross compensation in the form of ABB shares.

(10) Elected as new Board member at the ABB Ltd 2016 AGM; did not stand for re-election at the ABB Ltd 2017 AGM; Member of the Finance, Audit & Compliance Committee for the 2016-2017 Board term; elected to receive 50 percent of her gross compensation in the form of ABB shares.

(11) Elected as new Board member at the ABB Ltd 2017 AGM; Member of the Governance & Nomination Committee for the 2017-2018 Board term; elected to receive 100 percent of his gross compensation in the form of ABB shares.

(12) Chairman of the Finance, Audit & Compliance Committee for the 2015-2016, 2016-2017 and 2017-2018 Board terms; elected to receive 50 percent of his gross compensation in the form of ABB shares.

(13) Elected as new Board member at the ABB Ltd 2016 AGM; Member of the Finance, Audit & Compliance Committee for the 2016-2017 and 2017-2018 Board terms; elected to receive 50 percent of his gross compensation in the form of ABB shares.

(14) Elected as new Board member at the ABB Ltd 2016 AGM; Member of the Finance, Audit & Compliance Committee for the 2016-2017 and 2017-2018 Board terms; elected to receive 50 Percent of his gross compensation in the form of ABB shares.

(15) Chairman of the Compensation Committee for the 2015-2016 and 2016-2017 Board terms; did not stand for re-election at the ABB Ltd 2017 AGM; elected to receive 50 percent of his gross compensation in the form of ABB shares.

(16) Member of the Compensation Committee for the 2015-2016, 2016-2017 and 2017-2018 Board terms; Member of the Finance, Audit & Compliance Committee for the last month of the 2015-2016 Board term; elected to receive 50 percent of her gross compensation in the form of ABB shares.

Compensation Exhibit 21: Board compensation for the Board terms 2017-2018 and 2016-2017

Name	Specific Board Roles	Board term	Board term
		2017-2018	2016-2017
		CHF	CHF
Peter Voser	Chairman of the Board, Chairman of GNC	1,200,000	1,200,000
Jacob Wallenberg	Vice-Chairman of the Board, Member GNC	450,000	450,000
Matti Alahuhta	Member GNC	320,000	320,000
David Constable	Chairman CC	350,000	320,000
Frederico Curado	Member CC	320,000	320,000
Robyn Denholm	Member FACC (until 13 April 2017, did not stand for re-election)	—	330,000
Lars Förberg ⁽¹⁾	Member GNC	320,000	—
Louis R. Hughes	Chairman of FACC	400,000	400,000
David Meline	Member FACC	330,000	330,000
Satish Pai	Member FACC	330,000	330,000
Michel de Rosen	Chairman of CC (until 13 April 2017, did not stand for re-election)	—	350,000
Ying Yeh	Member CC	320,000	320,000
Total		4,340,000	4,670,000

(1) Joined the Board at the 2017 ABB Ltd AGM.

Key:

CC: Compensation Committee

FACC: Finance, Audit & Compliance Committee

GNC: Governance & Nomination Committee

Compensation Exhibit 22: Board ownership of ABB shares

Name	Total number of shares held	
	December 31, 2017	December 31, 2016
Peter Voser ⁽¹⁾	151,166	102,137
Jacob Wallenberg	209,583	202,190
Matti Alahuhta	36,521	31,265
David Constable	14,797	9,295
Frederico Curado	7,439	2,573
Robyn Denholm	—	2,871
Lars Förberg	6,494	—
Louis R. Hughes	35,716	53,145
David Meline ⁽²⁾	11,442	6,021
Satish Pai	7,889	2,871
Michel de Rosen	—	79,443
Ying Yeh	35,455	30,518
Total	516,502	522,329

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

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

Compensation Exhibit 23: EC compensation in 2017

Name	Cash Compensation					Estimated value of share-based grants under the LTIP in 2017 ⁽⁴⁾	Estimated value of replacement share grant ⁽⁵⁾	2017 Total (incl. conditional share-based grants) ⁽⁶⁾
	Base salary	Short-term variable compensation ⁽¹⁾	Pension benefits	Other benefits ⁽²⁾	2017 Total cash-based compensation ⁽³⁾			
	CHF	CHF	CHF	CHF	CHF	CHF	CHF	CHF
Ulrich Spiesshofer	1,679,176	2,413,763	626,074	916,140	5,635,153	3,671,675	—	9,306,828
Timo Ihamuotila (EC member as of April 1, 2017) ⁽⁵⁾	690,009	655,278	362,201	473,848	2,181,336	998,965	2,553,435	5,733,736
Jean-Christophe Deslarzes ⁽⁷⁾	936,674	1,007,680	500,652	500,493	2,945,499	1,103,374	—	4,048,873
Diane de Saint Victor	1,000,001	1,005,000	295,325	279,321	2,579,647	979,231	—	3,558,878
Frank Duggan ⁽⁸⁾	664,042	651,425	348,494	433,783	2,097,744	852,386	—	2,950,130
Greg Scheu ⁽⁹⁾	801,386	648,322	265,877	94,270	1,809,855	800,177	—	2,610,032
Chunyuan Gu (EC member as of July 1, 2017) ⁽¹⁰⁾	374,893	385,765	131,563	203,488	1,095,709	743,963	—	1,839,672
Sami Atiya ⁽⁷⁾	716,673	686,160	435,786	416,816	2,255,435	845,147	—	3,100,582
Tarak Mehta	860,004	823,880	467,597	578,054	2,729,535	842,145	—	3,571,680
Claudio Facchin	805,006	680,400	456,410	474,153	2,415,969	950,768	—	3,366,737
Peter Terwiesch ⁽⁷⁾	764,173	714,560	440,272	337,623	2,256,628	903,833	—	3,160,461
Eric Elzvik (EC member until March 31, 2017) ⁽⁶⁾	212,502	212,500	69,847	26,789	521,638	—	—	521,638
Bernhard Jucker (EC member until June 30, 2017)	520,006	525,000	277,663	399,154	1,721,823	1,140,137	—	2,861,960
Total Executive Committee members	10,024,545	10,409,733	4,677,761	5,133,932	30,245,971	13,831,801	2,553,435	46,631,207

- (1) Represents accrued short-term variable compensation for the year 2017 for all current EC members, which will be paid in 2018, after the publication of ABB's audited consolidated financial statements. Short-term variable compensation is linked to the objectives defined in each EC member's scorecard. Upon full achievement of these objectives, the short-term variable compensation of the CEO corresponds to 150 percent of his base salary, while for each other EC member it represents 100 percent of their respective base salary. Bernhard Jucker and Eric Elzvik both received a pro-rata short-term variable compensation payment for their period of service as an EC member, in accordance with the contractual obligations of ABB.
- (2) Other benefits comprise payments related to social security, health insurance, children's education, transportation, tax advice and certain other items.
- (3) Prepared on an accruals basis.
- (4) On the day of vesting (June 13, 2020), 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 parameters. The LTIP is also subject to service conditions. The estimated value of the share based grants are computed using a Monte Carlo simulation and the price of the ABB shares on the grant date, adjusted for expected foregone dividends during the vesting period.
- (5) Timo Ihamuotila received a replacement grant of 119,200 shares for foregone benefits from his previous employer, having a grant date fair value of CHF 2,553,435. Of the total, 42,572 shares will vest on April 1, 2019, while 76,628 shares will vest on April 1, 2020.
- (6) In addition to the total compensation of EC members, Eric Elzvik received CHF 1,389,860 representing contractual obligations of ABB for the period April - October 2017. Payments totaling CHF 113,273 were made in 2017 on behalf of certain other former EC members for the coverage of social security premium obligations and tax advice.
- (7) The increase in pension benefits is the result of a review of the EC's pension arrangements during 2015.
- (8) Frank Duggan received 20 percent of his base salary in AED and 80 percent in EUR. The company purchased EUR with AED to meet this obligation. All AED amounts were converted into Swiss francs using a rate of CHF 0.2660876 per AED.
- (9) Greg Scheu received 100 percent of his base salary in USD. All USD amounts were converted into Swiss francs using a rate of CHF 0.9773 per USD.
- (10) Chunyuan Gu received 100 percent of his base salary in CNY. All CNY amounts were converted into Swiss francs using a rate of CHF 0.149957 per CNY.

Compensation Exhibit 24: EC compensation in 2016

Name	Cash Compensation					Estimated value of share-based grants under the LTIP in 2016 ⁽⁴⁾	2016 Total (incl. conditional share-based grants) ⁽⁵⁾
	Base salary	Short-term variable compensation ⁽¹⁾	Pension benefits	Other benefits ⁽²⁾	2016 Total cash-based compensation ⁽³⁾		
	CHF	CHF	CHF	CHF	CHF		
Ulrich Spiesshofer	1,641,669	2,583,900	613,799	791,109	5,630,477	3,654,137	9,284,614
Eric Elzvik	850,007	827,050	274,835	332,831	2,284,723	843,920	3,128,643
Jean-Christophe Deslarzes ⁽⁶⁾	911,677	971,520	261,986	572,775	2,717,958	1,169,063	3,887,021
Diane de Saint Victor	1,000,001	1,062,000	295,325	300,410	2,657,736	992,853	3,650,589
Frank Duggan ⁽⁷⁾	686,042	715,540	342,359	613,772	2,357,713	997,526	3,355,239
Greg Scheu ⁽⁸⁾	837,507	791,840	248,397	128,055	2,005,799	896,680	2,902,479
Sami Atiya (EC member as of June 14, 2016)	387,122	373,858	213,242	292,415	1,266,637	745,453	2,012,090
Tarak Mehta	852,672	876,340	461,050	550,482	2,740,544	948,223	3,688,767
Bernhard Jucker	1,015,008	1,099,560	549,075	511,451	3,175,094	1,124,633	4,299,727
Claudio Facchin	770,837	771,540	442,172	507,909	2,492,458	991,170	3,483,628
Peter Terwiesch	729,175	748,965	243,558	179,954	1,901,652	933,992	2,835,644
Pekka Tiitinen (EC member until September 30, 2016)	543,759	543,750	179,184	405,585	1,672,278	—	1,672,278
Total Executive Committee members	10,225,476	11,365,863	4,124,982	5,186,748	30,903,069	13,297,650	44,200,719

(1) Represents accrued short-term variable compensation for the year 2016 for all EC members, which was paid in 2017. Short-term variable compensation is linked to the objectives defined in each EC member's scorecard. Upon full achievement of these objectives, the short-term variable compensation of the CEO corresponds to 150 percent of his base salary, while for each other EC member it represents 100 percent of their respective base salary.

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

(3) Prepared on an accruals basis.

(4) On the day of vesting (June 6, 2019), 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 parameters. The LTIP is also subject to service conditions. The estimated value of the share-based grants are computed using a Monte Carlo simulation and the price of ABB shares on the grant date.

(5) In addition to the total compensation of current EC members, Veli-Matti Reinikkala received CHF 2,055,537 representing contractual obligations of ABB for the period January - September 2016. Payments totaling CHF 11,535 were made in 2016 on behalf of certain other former EC members for tax advice.

(6) Other benefits of Jean-Christophe Deslarzes in 2016 includes the payment of social security premiums related to the vesting in November 2016 of the first tranche of his one-time replacement share grant.

(7) Frank Duggan received 20 percent of his base salary in AED and 80 percent in EUR. The company purchased EUR with AED to meet this obligation.

(8) Greg Scheu received 100 percent of his base salary in USD. All USD amounts were converted into Swiss francs using a rate of CHF 1.02135 per USD.

Compensation Exhibit 25: LTIP grants in 2017

Name	Reference number of shares under the performance component P1 of the 2017 launch of the LTIP ⁽¹⁾	Total estimated value of share-based grants under the performance component P1 of the 2017 launch of the LTIP ^{(2),(3)}	Reference number of shares under the performance component P2 of the 2017 launch of the LTIP ⁽¹⁾	Total estimated value of share-based grants under the performance component P2 of the 2017 launch of the LTIP ^{(2),(3)}	Total number of shares granted under the 2017 launch of the LTIP ⁽¹⁾	Total estimated value of share-based grants under the LTIP in 2017 ^{(2),(3)}
		CHF		CHF		CHF
Ulrich Spiesshofer ⁽⁴⁾	80,706	1,930,649	70,180	1,741,026	150,886	3,671,675
Timo Ihamuotila (EC member as of April 1, 2017) ⁽⁴⁾	20,500	490,401	20,500	508,564	41,000	998,965
Jean-Christophe Deslarzes ⁽⁴⁾	24,402	583,745	20,946	519,629	45,348	1,103,374
Diane de Saint Victor ⁽⁴⁾	17,826	426,434	22,283	552,797	40,109	979,231
Frank Duggan ⁽⁴⁾	17,492	418,444	17,492	433,942	34,984	852,386
Greg Scheu	14,567	348,472	18,208	451,705	32,775	800,177
Bernhard Jucker (EC member until June 30, 2017)	23,397	559,704	23,397	580,433	46,794	1,140,137
Sami Atiya	18,691	447,127	16,044	398,020	34,735	845,147
Tarak Mehta ⁽⁴⁾	15,331	366,749	19,163	475,396	34,494	842,145
Chunyuan Gu (EC member as of July 1, 2017)	15,598	365,218	15,598	378,745	31,196	743,963
Claudio Facchin	21,027	503,008	18,049	447,760	39,076	950,768
Peter Terwiesch ⁽⁴⁾	19,989	478,177	17,158	425,656	37,147	903,833
Total Executive Committee members at Dec. 31, 2017	289,526	6,918,128	279,018	6,913,673	568,544	13,831,801

(1) Vesting date June 13, 2020.

(2) The total estimated value of the performance components (P1 and P2) is computed using a Monte Carlo simulation and the price of the ABB shares on the grant date, adjusted for expected foregone dividends during the vesting period.

(3) It is expected that upon vesting 70 percent of the performance shares will be settled in shares while the value of the remaining 30 percent will be settled in cash for both performance components (P1 and P2). However, upon vesting participants have the possibility to elect to receive 100 percent of the vested award in shares.

(4) In addition to the above awards, seven members of the EC participated in the 14th launch of the ESAP in 2017, which will allow them to save over a 12-month period and, in November 2018, use their savings to acquire ABB shares under the ESAP. Each EC member who participated in ESAP will be entitled to acquire up to 380 ABB shares at an exercise price of CHF 26.26 per share.

Compensation Exhibit 26: LTIP grants in 2016

Name	Reference number of shares under the performance component P1 of the 2016 launch of the LTIP ⁽¹⁾	Total estimated value of share-based grants under the performance component P1 of the 2016 launch of the LTIP ^{(2),(4)}	Reference number of shares under the performance component P2 of the 2016 launch of the LTIP ⁽¹⁾	Total estimated value of share-based grants under the performance component P2 of the 2016 launch of the LTIP ^{(2),(4)}	Total number of shares granted under the 2016 launch of the LTIP ⁽¹⁾	Total estimated value of share-based grants under the LTIP in 2016 ^{(2),(3),(4)}
		CHF		CHF		CHF
Ulrich Spiesshofer ⁽⁵⁾	94,076	1,945,492	81,805	1,708,645	175,881	3,654,137
Eric Elzvik	18,037	373,006	22,546	470,914	40,583	843,920
Jean-Christophe Deslarzes ⁽⁵⁾	31,884	659,362	24,403	509,701	56,287	1,169,063
Diane de Saint Victor ⁽⁵⁾	21,220	438,830	26,525	554,023	47,745	992,853
Frank Duggan ⁽⁵⁾	27,206	562,621	20,822	434,905	48,028	997,526
Greg Scheu	21,572	446,109	21,572	450,571	43,144	896,680
Sami Atiya (EC member as of June 14, 2016)	19,125	376,380	18,568	369,073	37,693	745,453
Tarak Mehta ⁽⁵⁾	22,812	471,753	22,812	476,470	45,624	948,223
Bernhard Jucker ⁽⁵⁾	27,056	559,519	27,056	565,114	54,112	1,124,633
Claudio Facchin	27,032	559,022	20,690	432,148	47,722	991,170
Peter Terwiesch ⁽⁵⁾	25,473	526,782	19,496	407,210	44,969	933,992
Total Executive Committee members at Dec. 31, 2016	335,493	6,918,876	306,295	6,378,774	641,788	13,297,650

(1) Vesting date June 6, 2019.

(2) The estimated value of the shares of the P1 component represents the fair value of the ABB shares on the grant date of the award multiplied by the respective number of reference shares.

(3) The total estimated value of the performance component (P2) is computed using a Monte Carlo simulation and the price of ABB shares on the grant date.

(4) It is expected that upon vesting, that 70 of the performance shares will be settled in shares while the value of the remaining 30 percent will be settled in cash for both performance components P1 and P2. However, upon vesting, participants have the possibility to elect to receive 100 percent of the vested award in shares.

(5) In addition to the above awards, seven members of the EC participated in the 13th launch of the ESAP in 2016, which allowed them to save over a 12-month period and, in November 2017, use their savings to acquire ABB shares under the ESAP. Each EC members who participated in ESAP was entitled to acquire up to 500 ABB shares at an exercise price of CHF 20.12 per share.

Compensation Exhibit 27: EC shareholding overview at December 31, 2017

Name	Total number of shares held at December 31, 2017	Unvested at December 31, 2017				
		Reference number of shares deliverable under the 2015 performance components (P1 and P2) of the LTIP ⁽¹⁾ (vesting 2018)	Reference number of shares deliverable under the 2016 performance components (P1 and P2) of the LTIP ⁽¹⁾ (vesting 2019)	Reference number of shares deliverable under the 2017 performance components (P1 and P2) of the LTIP ⁽¹⁾ (vesting 2020)	Replacement share grant for foregone benefits from former employer ⁽²⁾ (vesting 2018)	Replacement share grant for foregone benefits from former employer ⁽²⁾ (vesting 2019 and 2020)
Ulrich Spiesshofer	410,646	172,465	175,881	150,886	—	—
Timo Ihamuotila (EC member as of April 1, 2017)	22,000	—	—	41,000	—	119,200
Jean-Christophe Deslarzes	96,651	51,413	56,287	45,348	65,819	—
Diane de Saint Victor	533,482	45,873	47,745	40,109	—	—
Frank Duggan	186,576	46,390	48,028	34,984	—	—
Greg Scheu	119,561	45,896	43,144	32,775	—	—
Sami Atiya	—	—	37,693	34,735	—	—
Tarak Mehta	159,222	42,780	45,624	34,494	—	—
Chunyuan Gu (EC member as of July 1, 2017)	13,570	25,937	25,799	31,196	—	—
Claudio Facchin	85,553	42,845	47,722	39,076	—	—
Peter Terwiesch	63,269	36,698	44,969	37,147	—	—
Total Executive Committee members as of Dec. 31, 2017	1,690,530	510,297	572,892	521,750	65,819	119,200

(1) It is expected that upon vesting, the LTIP will be settled 70 percent in shares and 30 percent in cash for the performance components (P1 and P2). However, participants have the possibility to elect to receive 100 percent of the vested award in shares.

(2) It is expected that the replacement share grants will be settled 70 in shares and 30 percent in cash. However, the participants have the possibility to elect to receive 100 percent of the vested award in shares.

Compensation Exhibit 28: EC ownership of ABB shares and options at December 31, 2016

Name	Total number of shares held at December 31, 2016	Vested at December 31, 2016	Unvested at December 31, 2016			
			Retention shares deliverable under the 2014 retention component of the LTIP ⁽²⁾ (vesting 2017)	Reference number of shares deliverable under the 2015 performance components (P1 and P2) of the LTIP ⁽²⁾ (vesting 2018)	Reference number of shares deliverable under the 2016 performance components (P1 and P2) of the LTIP ⁽²⁾ (vesting 2019)	Replacement share grant for foregone benefits from former employer ⁽³⁾ (vesting 2018)
Ulrich Spiesshofer	344,454	—	93,846	172,465	175,881	—
Eric Elzvik	71,369	408,875	30,549	44,562	40,583	—
Jean-Christophe Deslarzes	74,767	—	30,549	51,413	56,287	65,819
Diane de Saint Victor	507,824	—	35,940	45,873	47,745	—
Frank Duggan	158,528	—	27,548	46,390	48,028	—
Greg Scheu	101,250	221,375	26,159	45,896	43,144	—
Sami Atiya (EC member as of June 14, 2016)	—	—	—	—	37,693	—
Tarak Mehta	134,449	—	34,677	42,780	45,624	—
Bernhard Jucker	293,771	—	40,750	51,902	54,112	—
Claudio Facchin	63,795	—	31,083	42,845	47,722	—
Peter Terwiesch	46,312	—	16,457	36,698	44,969	—
Total Executive Committee members at Dec. 31, 2016	1,796,519	630,250	367,558	580,824	641,788	65,819

(1) Options may be sold or exercised to receive shares at the ratio of 5 options for 1 share.

(2) It is expected that upon vesting, the LTIP will be settled 70 percent in shares and 30 percent in cash for both the retention component (LTIP 2014) and performance component (P1 and P2 of LTIP 2015 and 2016). However, participants have the possibility to elect to receive 100 percent of the vested award in shares.

(3) It is expected that the replacement share grant will be settled 70 percent in shares and 30 percent in cash. However, the participant has the possibility to elect to receive 100 percent of the vested award in shares.

EMPLOYEES

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

	December 31,		
	2017	2016	2015
Europe	63,000	61,400	61,600
The Americas	28,800	29,000	30,900
Asia, Middle East and Africa	43,000	41,900	43,300
Total	134,800	132,300	135,800

The proportion of our employees that are represented by labor unions or are the subject of 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, 2017, we had approximately 413,000 shareholders. Approximately 190,000 were U.S. holders, of which approximately 500 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. 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

Antitrust

In April 2014, the European Commission announced its decision regarding its investigation of anticompetitive practices in the cables industry and granted ABB full immunity from fines under the European Commission’s leniency program. In December 2013, we agreed with the Brazilian Antitrust Authority (CADE) to settle its ongoing investigation into our involvement in anticompetitive practices in the cables industry and we agreed to pay a fine of approximately 1.5 million Brazilian reais (equivalent to approximately \$1 million on date of payment).

In Brazil, our Gas Insulated Switchgear business is under investigation by the CADE for alleged anticompetitive practices. In addition, the CADE has opened an investigation into certain other power businesses of ABB, including flexible alternating current transmission systems (FACTS) and power transformers. With respect to those aforementioned matters which are still ongoing, management is cooperating fully with the antitrust authorities. An informed judgment about the outcome of these investigations or the amount of potential loss or range of loss for ABB, if any, relating to these investigations cannot be made at this stage.

Suspect payments

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 its past dealings with Unaoil and its subsidiaries, including alleged improper payments made by these entities to third parties. The SFO has commenced an investigation into this matter. We are cooperating fully with the authorities. At this time, it is not possible for us to make an informed judgment about the outcome of these matters.

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 various legal proceedings, investigations, and claims that have not yet been resolved. With respect to the above-mentioned regulatory matters and commercial litigation contingencies, we will bear the costs of the continuing investigations and any related legal proceedings.

Liabilities recognized

At December 31, 2017 and 2016, we had aggregate liabilities of \$233 million and \$150 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 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 material adverse outcomes beyond the amounts accrued.

DIVIDENDS AND DIVIDEND POLICY

See “Item 3. Key Information—Dividends and Dividend Policy” and “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, 2017.

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, with Citibank, N.A. as depositary. Each ADS represents one share.

TRADING HISTORY

No suspension in the trading of our shares occurred in the years ended December 31, 2017, 2016 and 2015.

The table below sets forth, for the periods indicated, the reported high and low closing prices for the shares on the SIX Swiss Exchange and the NASDAQ OMX Stockholm Exchange and for the ADSs on the New York Stock Exchange.

	SIX Swiss Exchange		NASDAQ OMX Stockholm Exchange		New York Stock Exchange	
	High	Low	High	Low	High	Low
	(CHF)		(SEK)		(\$)	
Annual highs and lows						
2013	23.53	19.20	172.30	133.50	26.56	20.87
2014	24.75	19.16	175.70	145.70	27.09	20.37
2015	21.77	16.72	192.70	144.50	23.14	17.14
2016	22.49	16.04	199.00	137.10	22.88	16.06
2017	26.40	21.71	224.00	181.20	26.82	21.28
Quarterly highs and lows						
2016						
First quarter	18.89	16.04	160.50	137.10	19.58	16.06
Second quarter	20.96	18.22	177.30	155.40	21.62	18.98
Third quarter	22.12	18.71	194.90	163.50	22.81	18.90
Fourth quarter	22.49	19.91	199.00	182.60	22.88	20.38
2017						
First quarter	23.75	21.85	210.40	192.40	23.83	21.28
Second quarter	24.83	22.28	222.60	200.60	25.80	22.19
Third quarter	24.30	21.71	212.00	181.20	25.26	22.71
Fourth quarter	26.40	24.18	224.00	202.20	26.82	24.96
Monthly highs and lows						
2017						
August	22.80	21.71	191.50	181.20	23.64	22.71
September	23.98	22.41	201.60	186.10	24.75	23.26
October	26.08	24.18	219.40	202.20	26.13	24.96
November	26.26	24.88	220.50	210.80	26.28	25.09
December	26.40	24.92	224.00	213.10	26.82	25.42
2018						
January	27.13	25.95	226.60	219.40	28.60	27.02

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.

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.

Our Shares

ABB Ltd's shares are registered shares (*Namenaktien*) with a par value of CHF 0.12 each. The shares are fully paid and non-assessable. The shares rank *pari passu* in all respects with each other, including in respect of entitlements to dividends, to a share of the liquidation proceeds in the case of a liquidation of ABB Ltd, to advance subscription rights and to pre-emptive rights.

Each share carries one vote in ABB Ltd's general shareholders' meeting. Voting rights may be exercised only after a shareholder has been recorded in ABB Ltd's share register (*Aktienbuch*) as a shareholder with voting rights, or with Euroclear Sweden AB in Sweden, which maintains a subregister of ABB Ltd's share register. Euroclear Sweden AB is an authorized central securities depository under the Swedish Act on Registration of Financial Instruments and carries out, among other things, the duties of registrar for Swedish companies listed on the NASDAQ OMX Stockholm Exchange. Registration with voting rights is subject to the restrictions described in "Transfer of Shares".

The shares are not issued in certificated form and are held in collective custody at SIX SIS AG. Shareholders do not have the right to request printing and delivery of share certificates (*aufgehobener Titeldruck*), but may at any time request ABB Ltd to issue a confirmation of the number of registered shares held.

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 3. Key Information—Dividends and Dividend Policy".

Transfer of Shares

The transfer of shares is effected by corresponding entry in the books of a bank or depository institution. An acquirer of shares must file a share registration form in order to be registered in ABB Ltd's share register as a shareholder with voting rights. Failing such registration, the acquirer will not be able to participate in or vote at shareholders' meetings, but will be entitled to dividends, pre-emptive and advanced subscription rights, and liquidation proceeds.

An acquirer of shares will be recorded in ABB Ltd's share register with voting rights upon disclosure of its name and address. However, ABB Ltd may decline a registration with voting rights if the 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 declare in its registration application that it holds 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.

After having given the registered shareholder or nominee the right to be heard, the Board of Directors may cancel registrations in the share register retroactive to the date of registration if such registrations were made on the basis of incorrect information. The relevant shareholder or nominee will be informed promptly as to the cancellation. The Board of Directors will oversee the details and issue the instructions necessary for compliance with the preceding regulations. In special cases, it may grant exemptions from the rule concerning nominees.

Acquirers of registered shares who have chosen to have their shares registered in the share register with Euroclear Sweden AB are not requested to file a share registration form or declare that they have acquired the shares in their own name and for their own account in order to be registered as a shareholder with voting rights. However, in order to be entitled to vote at a shareholders' meeting those acquirers need to be entered in the Euroclear Sweden AB share register in their own name no later than six business days prior to the shareholders' meeting. Holders of such shares are also able to attend shareholders' meetings. Uncertificated shares registered with Euroclear Sweden AB may be pledged in accordance with Swedish law.

Except as described in this subsection, neither the Swiss Code of Obligations nor ABB Ltd's Articles of Incorporation limit any right to own ABB Ltd's shares, or any rights of non-resident or foreign shareholders to exercise voting rights of ABB Ltd's shares.

Shareholders' Meetings

Under Swiss law, the annual general meeting of shareholders must be held within six 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 proxy, but only 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. See "—Transfer of Shares". For practical reasons, shareholders must be registered in the share register with the right to vote no later than six 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.

Pre-emptive Rights

Shareholders of a Swiss corporation have certain pre-emptive rights to subscribe for new shares issued in connection with capital increases in proportion to the nominal amount of their shares held. A resolution adopted at a shareholders' meeting with a supermajority of two-thirds of the shares represented may, however, repeal, limit or suspend (or authorize the board of directors to repeal, limit or suspend) pre-emptive rights for cause. Cause includes an acquisition of a business or a part thereof, an acquisition of a participation in a company or the grant of shares to employees. In addition, based on Article 4bis para. 1 and para. 4 of ABB Ltd's Articles of Incorporation, pre-emptive rights of the shareholders are excluded in connection with the issuance of convertible or warrant-bearing bonds or other financial market instruments, shares to employees of ABB issued out of ABB Ltd's contingent share capital or the grant of warrant rights to shareholders, or may be restricted or denied by the Board of Directors of ABB Ltd under certain circumstances as set forth in Article 4ter of ABB Ltd's Articles of Incorporation. See "Item 6. Directors, Senior Management and Employees—Shares".

Advance Subscription Rights

Shareholders of a Swiss corporation may have an advance subscription right with respect to bonds and other instruments issued in connection with options or conversion rights for shares if such option or conversion rights are based on the corporation's conditional capital. However, the shareholders' meeting can, with a supermajority of two-thirds of the shares represented at the meeting, exclude or restrict (or authorize the board of directors to exclude or restrict) such advance subscription rights for cause. See "Item 6. Directors, Senior Management and Employees—Shares—Contingent share capital".

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.

Repurchase of Shares

Swiss law limits a corporation's ability to repurchase or hold its own shares. ABB Ltd and its subsidiaries may only repurchase shares if ABB Ltd has sufficient freely distributable reserves to pay the purchase price, and the aggregate nominal value of such shares does not exceed 10 percent of ABB Ltd's total share capital. Furthermore, ABB Ltd must create a special reserve on its balance sheet in the amount of the purchase price of the acquired shares. Such shares held by ABB Ltd or its subsidiaries do not carry any rights to vote at shareholders' meetings, but are entitled to the economic benefits applicable to the shares generally and are considered to be "outstanding" under Swiss law.

Notices

Written communication by ABB Ltd to its shareholders will be sent by ordinary mail to the last address of the shareholder or authorized recipient entered in the share register. To the extent that personal notification is not mandated by law, all communications to the shareholders are validly made by publication in the Swiss Official Gazette of Commerce (*Schweizerisches Handelsamtsblatt*). To the extent required by the listing rules of the SIX Swiss Exchange, the NASDAQ OMX Stockholm Exchange, or the New York Stock Exchange, notices will be published in accordance with the rules of those exchanges. All such shareholder notices will also be published on ABB's website.

Duration, Liquidation and Merger

The duration of ABB Ltd as a legal entity is unlimited. It may be dissolved at any time by a shareholders' resolution which must be approved by a supermajority of two-thirds of the shares represented at the general meeting of shareholders (this supermajority requirement applies in the event of a dissolution by way of liquidation or a merger where ABB Ltd is not the surviving entity). Dissolution by court order is possible if it becomes bankrupt or if holders of at least 10 percent of its share capital registered in the commercial register can establish cause for dissolution.

Under Swiss law, any surplus arising out of a liquidation of a corporation (after the settlement of all claims of all creditors) is distributed to the shareholders in proportion to the paid-up par value of shares held, but this surplus is subject to Swiss withholding tax of 35 percent (see "—Taxation" below).

Disclosure of Major Shareholders

Under the Swiss Stock Exchange 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 exchange(s) in Switzerland on which such shares are listed of such holdings in writing within four trading days, whether or not the voting rights can be exercised. Following receipt of such a notification, the corporation must inform the public within two trading days.

An additional disclosure requirement exists under the Swiss Code of Obligations, according to which ABB Ltd must disclose individual shareholders and groups of shareholders acting in concert and their shareholdings if they hold more than 5 percent of all voting rights and ABB Ltd knows or has reason to know of such major shareholders. Such disclosures must be made once a year in the notes to the financial statements as published in its annual report. For a list of our major shareholders, see "Item 7. Major Shareholders and Related Party Transactions—Major Shareholders".

Mandatory Offering Rules

Under the Swiss Financial Market Infrastructure Act, shareholders and groups of shareholders acting in concert who acquire more than 33¹/₃ percent of the voting rights (whether exercisable or not) of a listed Swiss company have to submit a takeover bid to all remaining shareholders unless the articles of incorporation of the company provide for an alteration of this obligation. ABB Ltd's Articles of Incorporation do not provide for any alterations of the acquiror's obligations under the Swiss Financial Market Infrastructure Act. The mandatory offer obligation may be waived under certain circumstances, for example if another shareholder owns a higher percentage of voting rights than the acquiror. A waiver from the mandatory bid rules may be granted by the Swiss Takeover Board. If no waiver is granted, the mandatory takeover bid must be made pursuant to the procedural rules set forth in the Swiss Financial Market Infrastructure Act and the implementing ordinances.

Other than the rules discussed in this section and in the section above entitled “—Duration, Liquidation and Merger” and “—Shareholders' Meetings” (which reflect mandatory provisions of Swiss law), no provision of ABB Ltd's Articles of Incorporation would operate only with respect to a merger, acquisition or corporate restructuring of ABB (or any of its subsidiaries) and have the effect of delaying, deferring or preventing a change in control of ABB.

Cancellation of Remaining Equity Securities

Under Swiss law, any offeror who has made a tender offer for the shares of a Swiss target company and who, as a result of such offer, holds more than 98 percent of the voting rights of the target company, may petition the court to cancel the remaining equity securities. The corresponding petition must be filed against the target company within three months after the lapse of the offer period. The remaining shareholders may join in the proceedings. If the court orders cancellation of the remaining equity securities, the target company will reissue the equity securities and deliver such securities to the offeror against performance of the offer for the benefit of the holders of the cancelled equity securities.

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.

Ernst & Young AG, Switzerland, assumed the sole auditing mandate of the consolidated financial statements of the ABB Group beginning in the year ended December 31, 2001 (having previously been joint auditors since 1994). The auditor in charge and responsible for the mandate, Leslie Clifford, began serving in this capacity in respect of the financial year ended December 31, 2013.

During 2017, ABB announced that its Board of Directors intends to appoint KPMG AG as its external auditor effective for the financial year ending December 31, 2018. The appointment is subject to shareholder approval at the Annual General Meeting of shareholders.

See “Item 16C. Principal Accountant Fees and Services” for information regarding the fees paid to Ernst & Young AG.

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.

Revolving Credit Facility

On May 23, 2014, 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. 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 Exhibit 4.1 to this Annual Report.

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, dated as of May 8, 2012, among ABB Finance (USA) Inc., ABB and Deutsche Bank Trust Company Americas (the “Indenture”). The notes due in 2017 were repaid at maturity. Pursuant to the terms of the Indenture, ABB has fully and unconditionally guaranteed payment of principal, premium, if any, and interest in respect of the outstanding notes. See Exhibit 4.2 to this Annual Report.

EXCHANGE CONTROLS

Other than in connection with Swiss government sanctions imposed on Belarus, the Republic of Burundi, the Central African Republic, the Democratic Republic of the Congo, Eritrea, Guinea, the Islamic Republic of Iran, the Republic of Iraq, Lebanon, Libya, the Republic of Mali, Myanmar (Burma), the Democratic People’s Republic of Korea (North Korea), the Republic of Guinea-Bissau, Somalia, the Republic of South Sudan, Sudan, Syria, 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 certain measures in connection with the prevention of circumvention of international 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. 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. A reduction of the shares’ nominal value by means of a capital reduction and repayments of qualifying contributions from shareholders exceeding the nominal share capital do not represent a dividend or similar distribution for purposes of Swiss withholding tax and can therefore be distributed without deduction of Swiss withholding tax.

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 entered into force on December 19, 1997 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 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 any distribution (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 2017, 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" (a "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, 2017 and does not expect to be classified as a PFIC for the taxable year ending December 31, 2018. 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. 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 depositary, 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, as the case may be. 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, as the case may be, 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, as the case may be.

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. These materials, including this Annual Report and the exhibits thereto, may be inspected and copied at prescribed rates at the SEC's public reference room at 450 Fifth Street, N.W., Washington, D.C. 20549. Further information on the operation of the public reference room may be obtained by calling the SEC at 1-800-SEC-0330. The SEC also maintains a Web site at www.sec.gov that contains reports and other information regarding registrants that file electronically with the SEC. Our annual reports and some of the other information we submit to the SEC may be accessed through this Web site. In addition, material that we file can be inspected at the offices of the New York Stock Exchange at 20 Broad 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 Group Treasury Operations function. Our Group 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 Group 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.

Group 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 Group 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 Group Treasury Operations, where legally possible, to hedge their exposures. Where local laws restrict our operating companies from entering into intercompany derivatives with Group 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 Group Treasury Operations, but create no additional market risks on a consolidated basis. Group 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. Group Treasury Operations also hedges currency risks arising from monetary intercompany balances, primarily loans receivable from other ABB companies.

At December 31, 2017 and 2016, the net fair value of financial instruments with exposure to foreign currency rate movements was an asset of \$700 million and \$876 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 \$387 million and \$444 million for December 31, 2017 and 2016, 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 Group 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 Group Treasury Operations. Group 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, 2017 and 2016, the net fair value of instruments subject to Interest Rate Risk was a liability of \$2,021 million and \$1,482 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 \$221 million and \$292 million, for December 31, 2017 and 2016, respectively.

Equity Risk

Certain of our entities have equity investments that expose us to equity price risk. At December 31, 2017 and 2016, the net fair value of equity risk sensitive instruments was an asset of \$42 million and \$37 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 \$15 million and \$10 million, for December 31, 2017 and 2016, respectively.

Commodity Risk

We enter into commodity derivatives to hedge certain of our raw material exposures. At December 31, 2017 and 2016, the net fair value of commodity derivatives was an asset of \$35 million and \$26 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 \$36 million and \$31 million for December 31, 2017 and 2016, 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

Depository fees payable upon the issuance and cancellation of ADSs are typically paid to the depository bank by the brokers (on behalf of their clients) receiving the newly-issued ADSs from the depository bank and by the brokers (on behalf of their clients) delivering the ADSs to the depository bank for cancellation. The brokers in turn may charge these transaction fees to their clients.

Depository fees payable in connection with distributions of cash or securities to ADS holders and the depository services fee are charged by the depository bank to the holders of record of ADSs as of the applicable ADS record date. The depository 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 depository 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 depository 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 depository 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 depository banks.

In the event of refusal to pay the depository fees, the depository 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 depository fees from any distribution to be made to the ADS holder.

Depository fees are as follows:

Depository Service	Fee
Issuance of ADSs upon deposit of shares	Up to \$5.00 per 100 ADSs (or fraction thereof) issued.
Delivery of deposited security against surrender of ADSs	Up to \$5.00 per 100 ADSs (or fraction thereof) surrendered.
Distribution of dividend	Up to \$2.00 per 100 ADSs (or fraction thereof) held.
Distribution of cash proceeds	Up to \$2.00 per 100 ADSs (or fraction thereof) held.
Distribution of ADSs pursuant to exercise of rights	Up to \$5.00 per 100 ADSs (or fraction thereof) issued.

Depository Payments

In 2017, we received reimbursements from Citibank N.A., the Depository Bank of our ADS program, of approximately \$4 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

Background and status of remediation of reported 2016 material weakness

In February 2017, we discovered a scheme to embezzle and misappropriate funds in our subsidiary in South Korea. Under the direction and supervision of the Board of Directors, management commenced an investigation into this fraudulent activity. As a result of the investigation, we concluded that we had a material weakness in our internal control over financial reporting as of December 31, 2016. Specifically, we did not maintain adequate segregation of duties in the treasury function in our South Korean subsidiary and failed to identify certain inappropriate access levels to the local ERP system. In addition, we failed to safeguard physical access to the signature seals of the subsidiary in South Korea and prevent the Company from being bound to unauthorized financial contracts, resulting in undetected financial obligations. We also failed to provide adequate management oversight and review of the local treasury activities. As a result, we did not maintain effective controls over the safeguarding of cash and other treasury activities, including controls relating to entering into financial contracts.

Remediation of material weakness

During 2017, we took the following actions in order to remediate the material weakness:

- Reviewed roles and responsibilities to ensure appropriate segregation of duties
- Evaluated and adjusted access rights to ERP systems to be consistent with job functions
- Implemented procedures to enforce access controls over signature seals
- Improved oversight and review procedures over treasury activities
- Increased awareness and training about risk and control
- Conducted additional in-depth examinations of other significant processes

As a result of these remediation efforts, including allowing for a sufficient period of time to confirm that the new processes and controls put in place as part of the remediation are operating effectively, management has concluded that the Company has remediated the material weaknesses as of December 31, 2017. However, we cannot assure you that our internal control over financial reporting will not be subject to material weaknesses in the future. If we fail to maintain the adequacy of our internal control over financial reporting and our operating internal controls, including any failure to implement required new or improved controls as a result of changes to our business or otherwise, or if we experience difficulties in their implementation, our business, results of operations and financial condition could be materially adversely affected and we could fail to meet our reporting obligations.

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, Ulrich Spiesshofer, 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, 2017. Based on that evaluation, management, including the Chief Executive Officer and Chief Financial Officer, has concluded that, as of December 31, 2017, our disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and that such information has been accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

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, 2017. 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, 2017.

Ernst & Young AG, the independent registered public accounting firm that audited the financial statements included in this annual report, has issued an opinion on the effectiveness of the ABB Group’s internal control over financial reporting as of December 31, 2017.

Report of the independent registered public accounting firm

Ernst & Young AG’s opinion on the effectiveness of the ABB Group’s internal control over financial reporting as of December 31, 2017, is included in “Item 18. Financial Statements”.

Changes in internal control over financial reporting

In 2017, we continued consolidating and standardizing the structure of our shared service centers, mainly impacting the controls applicable to transactions within finance, human resources, information systems and supply chain management functions. The new Global Business Services (GBS) approach has involved changes in personnel as well as to the location of performance for some controls; however, the basic internal controls over financial reporting have not significantly changed. Management believes it took the necessary steps to maintain appropriate internal controls and to monitor their operation during the GBS transformation period.

Except as described in “Remediation of material weakness” above and in the immediately preceding paragraph, there have been no significant 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 15T. Controls and Procedures

Not applicable

Item 16A. Audit Committee Financial Expert

Our Board of Directors has determined that Louis R. Hughes, David Meline 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 and the listing standards promulgated by the New York Stock Exchange, and are audit committee financial experts.

Item 16B. Code of Ethics

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 Web site in the section “Corporate governance” at www.abb.com/investorrelations

Item 16C. Principal Accountant Fees and Services

Audit Fees

Fees for audit services provided by Ernst & Young totaled approximately \$28.3 million and \$24.9 million in 2017 and 2016, respectively. 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 and comfort letters delivered to underwriters in connection with debt and equity offerings. Included in the 2017 audit fees were approximately \$2.4 million related to the 2016 audit, which were not agreed until after the Company had filed its annual report on Form 20-F with the SEC on March 13, 2017.

Audit-Related Fees

Fees for audit-related services provided by Ernst & Young totaled approximately \$1.2 million and \$2.2 million in 2017 and 2016, respectively, consisting primarily of 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 provided by Ernst & Young totaled approximately \$1.1 million and \$2.2 million in 2017 and 2016, respectively, representing primarily income tax and indirect tax compliance services as well as tax advisory services.

All Other Fees

Fees for other services provided by Ernst & Young, not included in the above three categories, totaled approximately \$0.1 million and \$0.2 million in 2017 and 2016, respectively.

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 Ernst & Young. The procedure requires that all proposed engagements of Ernst & Young 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 Ernst & Young in 2017 and 2016, as discussed above in this Item 16C, were approved by the FACC.

Item 16D. Exemptions from the Listing Standards for Audit Committees

Not applicable

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.

Period	Total number of shares purchased ⁽¹⁾	Average price paid per share ⁽²⁾	Total number of shares purchased as part of publicly announced program	Approximate USD-equivalent value of shares that may yet be purchased under the program
May 18 - May 31, 2017	6,366,967	\$24.92	n.a.	n.a.
June 1 - June 8, 2017	3,633,033	\$25.38	n.a.	n.a.
Total	10,000,000			

(1) The share purchases were made through open-market transactions and are not part of any publicly announced program.

(2) Represents volume weighted-average prices in CHF translated into USD using daily closing foreign exchange rates.

Item 16F. Change in Registrant's Certifying Accountant

There was no change in the Company's Certifying Accountant during 2017 and 2016.

In 2017, the Company completed a tender process to select the auditor of the Company commencing with the 2018 fiscal year. As a result, the Board of Directors concluded that KPMG AG, Switzerland, would be proposed to the Annual General Meeting of the Shareholders to become the auditors of the Company starting in that year. The shareholders are scheduled to vote on this proposal on March 29, 2018.

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.

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-72, 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.
- 2.1 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.
- 2.2 Form of American Depositary Receipt (included in Exhibit 2.1).
- 4.1 \$2,000,000,000 Multicurrency Revolving Credit Agreement, dated May 23, 2014, and as amended on June 13, 2014, entered into between ABB Ltd, certain subsidiaries of ABB Ltd as borrowers, 27 banks as mandated lead arrangers, Citibank International PLC, as facility agent and euro swingline agent and Citibank N.A. as dollar swingline agent. Incorporated by reference to Exhibit 4.1 to the Form 20-F filed by ABB Ltd on March 5, 2015.
- 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 4.1 to the Registration Statement on Form F-3 filed by ABB Ltd and ABB Finance (USA) Inc. on April 25, 2012.
- 7.1 Computation of Ratio of Earnings to Fixed Charges.
- 8.1 Subsidiaries of ABB Ltd as of December 31, 2017.
- 12.1 Certification of the chief executive officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
- 12.2 Certification of the chief financial officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
- 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 Independent Registered Public Accounting Firm.
- 101 The following financial information from this Annual Report formatted in XBRL (Extensible Business Reporting Language) includes (i) Consolidated Income Statements, (ii) Consolidated Statements of Comprehensive Income, (iii) Consolidated Balance Sheets, (iv) Consolidated Statements of Cash Flows, (v) Consolidated Statements of Changes in Stockholders' Equity, (vi) Notes to the Consolidated Financial Statements, tagged as blocks of text, (vii) each significant accounting policy within "Note 2 Significant accounting policies", tagged as a single block of text, (viii) each table in the Notes to the Consolidated Financial Statements, tagged as a separate block of text and, (ix) each amount in the Notes to the Consolidated Financial Statements, tagged separately. ***Furnished electronically herewith.***

* This document is being furnished in accordance with SEC Release Nos. 33-8212 and 34-74551.

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 22, 2018

By: /s/ TIMO IHAMUOTILA

Name: Timo Ihamuotila

Title: *Executive Vice President and
Chief Financial Officer*

Date: February 22, 2018

By: /s/ RICHARD A. BROWN

Name: Richard A. Brown

Title: *Group Senior Vice President and
Chief Counsel Corporate & Finance*

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS AND SCHEDULES

Consolidated Financial Statements:

Report of management on internal control over financial reporting	F-2
Reports of Independent Registered Public Accounting Firm	F-3
Consolidated Income Statements for the years ended December 31, 2017, 2016 and 2015	F-5
Consolidated Statements of Comprehensive Income for the years ended December 31, 2017, 2016 and 2015	F-6
Consolidated Balance Sheets as of December 31, 2017 and 2016	F-7
Consolidated Statements of Cash Flows for the years ended December 31, 2017, 2016 and 2015	F-8
Consolidated Statements of Changes in Stockholders' Equity for the years ended December 31, 2017, 2016 and 2015	F-9
Notes to the Consolidated Financial Statements	F-10

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, 2017.

Ernst & Young 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, 2017, which is included on page F-4 of this Annual Report.

/s/ ULRICH SPIESSHOFER

Chief Executive Officer

/s/ TIMO IHAMUOTILA

Chief Financial Officer

Zurich, February 22, 2018

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of ABB Ltd

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of ABB Ltd (the Company) as of December 31, 2017 and 2016, and the related consolidated statements of income, comprehensive income, cash flows and changes in stockholders' equity for each of the three years in the period ended December 31, 2017, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the consolidated financial position of the Company at December 31, 2017 and 2016, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2017, 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, 2017, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 22, 2018, expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's Board of Directors and management. Our responsibility is to express an opinion on the Company's 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 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 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young AG

We have served as the Company's auditor since 1994.

Zurich, Switzerland

February 22, 2018

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's internal control over financial reporting as of December 31, 2017, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, ABB Ltd (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, based on the COSO criteria.

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, 2017 and 2016, and the related consolidated statements of income, comprehensive income, cash flows and changes in stockholders' equity for each of the three years in the period ended December 31, 2017, and the related notes and our report dated February 22, 2018 expressed an unqualified opinion thereon.

Basis for Opinion

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

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and 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/ Ernst & Young AG

Zurich, Switzerland
February 22, 2018

ABB Ltd
Consolidated Income Statements
Year ended December 31 (\$ in millions, except per share data in \$)

	<u>2017</u>	<u>2016</u>	<u>2015</u>
Sales of products	28,133	27,816	29,477
Sales of services and other	6,179	6,012	6,004
Total revenues	34,312	33,828	35,481
Cost of sales of products	(20,313)	(20,431)	(21,694)
Cost of services and other	(3,733)	(3,650)	(3,653)
Total cost of sales	(24,046)	(24,081)	(25,347)
Gross profit	10,266	9,747	10,134
Selling, general and administrative expenses	(5,607)	(5,349)	(5,574)
Non-order related research and development expenses	(1,365)	(1,300)	(1,406)
Other income (expense), net	140	(111)	(105)
Income from operations	3,434	2,987	3,049
Interest and dividend income	74	73	77
Interest and other finance expense	(277)	(261)	(286)
Income from continuing operations before taxes	3,231	2,799	2,840
Provision for taxes	(860)	(781)	(788)
Income from continuing operations, net of tax	2,371	2,018	2,052
Income (loss) from discontinued operations, net of tax	(6)	16	3
Net income	2,365	2,034	2,055
Net income attributable to noncontrolling interests	(152)	(135)	(122)
Net income attributable to ABB	2,213	1,899	1,933
<i>Amounts attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	2,219	1,883	1,930
Net income	2,213	1,899	1,933
<i>Basic earnings per share attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	1.04	0.88	0.87
Net income	1.04	0.88	0.87
<i>Diluted earnings per share attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	1.03	0.87	0.87
Net income	1.03	0.88	0.87
<i>Weighted-average number of shares outstanding (in millions) used to compute:</i>			
Basic earnings per share attributable to ABB shareholders	2,138	2,151	2,226
Diluted earnings per share attributable to ABB shareholders	2,148	2,154	2,230

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)

	2017	2016	2015
Net income	2,365	2,034	2,055
Other comprehensive income (loss), net of tax:			
<i>Foreign currency translation adjustments:</i>			
Foreign currency translation adjustments	912	(481)	(1,058)
Changes attributable to divestments	12	7	—
Foreign currency translation adjustments	924	(474)	(1,058)
<i>Available-for-sale securities:</i>			
Net unrealized gains (losses) arising during the year	1	—	(7)
Reclassification adjustments for net (gains) losses included in net income	—	—	1
Unrealized gains (losses) on available-for-sale securities	1	—	(6)
<i>Pension and other postretirement plans:</i>			
Prior service (costs) credits arising during the year	(16)	(40)	88
Net actuarial gains (losses) arising during the year	(139)	44	210
Amortization of prior service cost included in net income	6	26	26
Amortization of net actuarial loss included in net income	63	62	82
Net losses from pension settlements included in net income	9	26	9
Changes attributable to divestments	6	—	—
Pension and other postretirement plan adjustments	(71)	118	415
<i>Cash flow hedge derivatives:</i>			
Net unrealized gains (losses) arising during the year	38	16	(20)
Reclassification adjustments for net (gains) losses included in net income	(22)	(6)	30
Changes attributable to divestments	(3)	—	—
Unrealized gains (losses) of cash flow hedge derivatives	13	10	10
Total other comprehensive income (loss), net of tax	867	(346)	(639)
Total comprehensive income, net of tax	3,232	1,688	1,416
Comprehensive income attributable to noncontrolling interests, net of tax	(177)	(118)	(100)
Total comprehensive income, net of tax, attributable to ABB	3,055	1,570	1,316

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)

	<u>2017</u>	<u>2016</u>
Cash and equivalents	4,526	3,644
Marketable securities and short-term investments	1,102	1,953
Receivables, net	10,416	9,696
Inventories, net	5,059	4,347
Prepaid expenses	189	176
Other current assets	647	688
Assets held for sale	—	548
Total current assets	21,939	21,052
Property, plant and equipment, net	5,363	4,743
Goodwill	11,199	9,501
Other intangible assets, net	2,622	1,996
Prepaid pension and other employee benefits	144	90
Investments in equity-accounted companies	158	170
Deferred taxes	1,250	1,118
Other non-current assets	587	532
Total assets	43,262	39,202
Accounts payable, trade	5,419	4,446
Billings in excess of sales	1,251	1,241
Short-term debt and current maturities of long-term debt	738	1,003
Advances from customers	1,367	1,398
Provisions for warranties	1,231	1,142
Other provisions	1,882	1,765
Other current liabilities	4,385	3,936
Liabilities held for sale	—	218
Total current liabilities	16,273	15,149
Long-term debt	6,709	5,800
Pension and other employee benefits	1,882	1,834
Deferred taxes	1,099	918
Other non-current liabilities	1,950	1,604
Total liabilities	27,913	25,305
<i>Commitments and contingencies</i>		
Stockholders' equity:		
Common stock, CHF 0.12 par value (2,168,148,264 and 2,214,743,264 issued shares at December 31, 2017 and 2016, respectively)	188	192
Additional paid-in capital	29	24
Retained earnings	19,594	19,925
Accumulated other comprehensive loss	(4,345)	(5,187)
Treasury stock, at cost (29,541,775 and 76,036,429 shares at December 31, 2017 and 2016, respectively)	(647)	(1,559)
Total ABB stockholders' equity	14,819	13,395
Noncontrolling interests	530	502
Total stockholders' equity	15,349	13,897
Total liabilities and stockholders' equity	43,262	39,202

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)

	<u>2017</u>	<u>2016</u>	<u>2015</u>
Operating activities:			
Net income	2,365	2,034	2,055
<i>Adjustments to reconcile net income to net cash provided by operating activities:</i>			
Depreciation and amortization	1,101	1,135	1,160
Deferred taxes	(205)	(147)	(219)
Net loss from derivatives and foreign exchange	39	10	15
Net gain from sale of property, plant and equipment	(36)	(38)	(26)
Net loss (gain) from sale of businesses	(252)	10	20
Share-based payment arrangements	58	54	61
Other	11	112	94
<i>Changes in operating assets and liabilities:</i>			
Trade receivables, net	(80)	10	162
Inventories, net	(55)	115	105
Trade payables	599	340	(112)
Accrued liabilities	112	80	(24)
Billings in excess of sales	(27)	(25)	35
Provisions, net	30	14	330
Advances from customers	(120)	(163)	106
Income taxes payable and receivable	196	125	(32)
Other assets and liabilities, net	63	177	88
Net cash provided by operating activities	3,799	3,843	3,818
Investing activities:			
Purchases of marketable securities (available-for-sale)	(312)	(1,214)	(1,925)
Purchases of short-term investments	(393)	(3,092)	(614)
Purchases of property, plant and equipment and intangible assets	(949)	(831)	(876)
Acquisition of businesses (net of cash acquired) and increases in cost- and equity-accounted companies	(2,130)	(26)	(56)
Proceeds from sales of marketable securities (available-for-sale)	514	1,057	434
Proceeds from maturity of marketable securities (available-for-sale)	100	539	1,022
Proceeds from short-term investments	945	2,241	653
Proceeds from sales of property, plant and equipment	66	61	68
Proceeds from sales of businesses (net of transaction costs and cash disposed) and cost- and equity-accounted companies	607	(1)	69
Net cash from settlement of foreign currency derivatives	63	(57)	231
Other investing activities	39	18	20
Net cash used in investing activities	(1,450)	(1,305)	(974)
Financing activities:			
Net changes in debt with maturities of 90 days or less	207	(152)	3
Increase in debt	921	912	68
Repayment of debt	(1,007)	(1,249)	(101)
Delivery of shares	163	192	107
Purchase of treasury stock	(251)	(1,299)	(1,487)
Dividends paid	(1,635)	—	(1,357)
Reduction in nominal value of common shares paid to shareholders	—	(1,610)	(392)
Dividends paid to noncontrolling shareholders	(127)	(122)	(137)
Other financing activities	(6)	(27)	(84)
Net cash used in financing activities	(1,735)	(3,355)	(3,380)
Effects of exchange rate changes on cash and equivalents	268	(104)	(342)
Net change in cash and equivalents—continuing operations	882	(921)	(878)
Cash and equivalents, beginning of period	3,644	4,565	5,443
Cash and equivalents, end of period	4,526	3,644	4,565
Supplementary disclosure of cash flow information:			
Interest paid	205	213	221
Taxes paid	894	814	1,043

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, 2017, 2016 and 2015 (\$ 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, 2015	1,725	52	19,939	(4,241)	(1,206)	16,269	546	16,815
Comprehensive income:								
Net income			1,933			1,933	122	2,055
Foreign currency translation adjustments, net of tax				(1,033)		(1,033)	(25)	(1,058)
Effect of change in fair value of available-for-sale securities, net of tax				(6)		(6)		(6)
Unrecognized income (expense) related to pensions and other postretirement plans, net of tax				412		412	3	415
Change in derivatives qualifying as cash flow hedges, net of tax				10		10		10
Total comprehensive income						1,316	100	1,416
Changes in noncontrolling interests		(30)	(25)			(55)	(2)	(57)
Dividends to noncontrolling shareholders						—	(137)	(137)
Dividends paid to shareholders			(1,317)			(1,317)		(1,317)
Share-based payment arrangements		61				61		61
Reduction in nominal value of common shares paid to shareholders	(285)	(64)	(54)			(403)		(403)
Purchase of treasury stock					(1,501)	(1,501)		(1,501)
Delivery of shares		(19)			126	107		107
Call options		4				4		4
Balance at December 31, 2015	1,440	4	20,476	(4,858)	(2,581)	14,481	507	14,988
Comprehensive income:								
Net income			1,899			1,899	135	2,034
Foreign currency translation adjustments, net of tax				(457)		(457)	(17)	(474)
Effect of change in fair value of available-for-sale securities, net of tax				—		—		—
Unrecognized income (expense) related to pensions and other postretirement plans, net of tax				118		118		118
Change in derivatives qualifying as cash flow hedges, net of tax				10		10		10
Total comprehensive income						1,570	118	1,688
Changes in noncontrolling interests						—	(1)	(1)
Dividends to noncontrolling shareholders						—	(122)	(122)
Share-based payment arrangements		54				54		54
Reduction in nominal value of common shares paid to shareholders	(1,239)	15	(402)			(1,626)		(1,626)
Cancellation of treasury shares	(9)	(31)	(2,007)		2,047	—		—
Purchase of treasury stock					(1,280)	(1,280)		(1,280)
Delivery of shares		(22)	(41)		255	192		192
Call options		4				4		4
Balance at December 31, 2016	192	24	19,925	(5,187)	(1,559)	13,395	502	13,897
Comprehensive income:								
Net income			2,213			2,213	152	2,365
Foreign currency translation adjustments, net of tax				899		899	25	924
Effect of change in fair value of available-for-sale securities, net of tax				1		1		1
Unrecognized income (expense) related to pensions and other postretirement plans, net of tax				(71)		(71)		(71)
Change in derivatives qualifying as cash flow hedges, net of tax				13		13		13
Total comprehensive income						3,055	177	3,232
Changes in noncontrolling interests		17				17	(14)	3
Dividends to noncontrolling shareholders						—	(134)	(134)
Dividends paid to shareholders			(1,622)			(1,622)		(1,622)
Share-based payment arrangements		58				58		58
Cancellation of treasury shares	(4)	(27)	(922)		953	—		—
Purchase of treasury stock					(251)	(251)		(251)
Delivery of shares		(46)			209	163		163
Call options		4				4		4
Balance at December 31, 2017	188	29	19,594	(4,345)	(647)	14,819	530	15,349

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 pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids, serving customers in utilities, industry and transport & infrastructure globally.

Note 2—Significant accounting policies

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

Basis of presentation

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

Reclassifications

Certain amounts reported for prior years in the Consolidated Financial Statements and the accompanying Notes have been reclassified to conform to the current year's presentation. These changes primarily relate to the reorganization of the Company's operating segments (see Note 23) and to the reclassification and netting of deferred tax assets and liabilities as a result of the adoption of an accounting standard update on the classification of deferred taxes (see "New accounting pronouncements - Applicable for current period" below).

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.

Operating cycle

A portion of the Company's activities (primarily long-term construction 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. The most significant, difficult and subjective of such accounting assumptions and estimates include:

- estimates used to record expected costs for employee severance in connection with restructuring programs,
- assumptions and projections, principally related to future material, labor and project-related overhead costs, used in determining the percentage-of-completion on projects,
- 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 used in the calculation of pension and postretirement benefits and the fair value of pension plan assets,
- estimates to determine valuation allowances for deferred tax assets and amounts recorded for uncertain tax positions,
- growth rates, discount rates and other assumptions used to determine impairment of long-lived assets and in testing goodwill for impairment,
- assumptions used in determining inventory obsolescence and net realizable value,
- estimates and assumptions used in determining the fair values of assets and liabilities assumed in business combinations, and
- assessment of the allowance for doubtful accounts.

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.

Marketable securities and short-term investments

Management determines the appropriate classification of held-to-maturity and available-for-sale securities at the time of purchase. At each reporting date, the appropriateness of the classification of the Company's investments in debt and equity securities is reassessed. 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 securities are stated 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 and equity securities that have readily determinable fair values are classified as available-for-sale and reported at fair value.

Unrealized gains and losses on available-for-sale 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 securities are computed based upon the historical cost of these securities, using the specific identification method.

Marketable debt securities are generally 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".

The Company performs a periodic review of its debt and equity securities to determine whether an other-than-temporary impairment has occurred. Generally, when an individual security has been in an unrealized loss position for an extended period of time, the Company evaluates whether an impairment has occurred. The evaluation is based on specific facts and circumstances at the time of assessment, which include general market conditions, and the duration and extent to which the fair value is below cost.

If the fair value of a debt security is less than its amortized cost, then an other-than-temporary impairment for the difference is recognized if (i) the Company has the intent to sell the security, (ii) it is more likely than not that the Company will be required to sell the security before recovery of its amortized cost base or (iii) a credit loss exists insofar as the Company does not expect to recover the entire recognized amortized cost of the security. Such impairment charges are generally recognized in “Interest and other finance expense”. If the impairment is due to factors other than credit losses, and the Company does not intend to sell the security and it is not more likely than not that it will be required to sell the security before recovery of the security’s amortized cost, such impairment charges are recorded in “Accumulated other comprehensive loss”.

In addition, for equity securities, the Company assesses whether the cost value will recover within the near-term and whether the Company has the intent and ability to hold that equity security until such recovery occurs. If an other-than-temporary impairment is identified, the security is written down to its fair value and the related losses are recognized in “Interest and other finance expense”, unless the impairment relates to equity securities classified as “Other non-current assets”, in which case the impairment is reported in “Other income (expense), net”.

Accounts receivable and allowance for doubtful accounts

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 customers’ financial position becomes known. In addition to the assignment to a risk category, a credit limit per customer is set.

The allowance for doubtful accounts is the Company’s best estimate of the amount of probable credit losses in existing accounts receivable. The Company determines the allowance based on historical write-off experience and customer specific data. If an amount has not been settled within its contractual payment term then it is considered past due. The Company reviews the allowance for doubtful accounts regularly and past due balances are reviewed for collectability. Account balances are charged off against the related allowance when the Company believes that the amount will not be recovered.

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 reserves for potential credit losses as discussed above in “Accounts receivable and allowance for doubtful accounts”. 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. In the Consolidated Financial Statements derivative transactions are presented on a gross basis.

Revenue recognition

The Company generally recognizes revenues for the sale of goods when persuasive evidence of an arrangement exists, delivery has occurred, the price is fixed or determinable and collectability is reasonably assured. With regards to the sale of products, delivery is not considered to have occurred, and therefore no revenues are recognized, until the customer 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 shipping 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). Subsequent to delivery of the products, the Company generally has no further contractual performance obligations that would preclude revenue recognition.

Revenues under long-term construction-type contracts are generally recognized using the percentage-of-completion method of accounting. 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 estimated costs, which are reviewed and updated routinely for contracts in progress. The cumulative effect of any change in estimate is recorded in the period when the change in estimate is determined.

Short-term construction-type contracts, or long-term construction-type contracts for which reasonably dependable estimates cannot be made or for which inherent hazards make estimates difficult, are accounted for under the completed-contract method. Revenues under the completed-contract method are recognized upon substantial completion—that is: acceptance by the customer, compliance with performance specifications demonstrated in a factory acceptance test or similar event.

For non construction-type contracts that contain customer acceptance provisions, revenue is deferred until customer acceptance occurs or the Company has demonstrated the customer-specified objective criteria have been met or the contractual acceptance period has lapsed.

Revenues from service transactions are recognized as services are performed. For long-term service contracts, revenues are recognized on a straight-line basis over the term of the contract or, if the performance pattern is other than straight-line, as the services are provided. 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, field service activities that include personnel and accompanying spare parts, and installation and commissioning of products as a stand-alone service or as part of a service contract.

Revenues for software license fees are recognized when persuasive evidence of a non-cancelable license agreement exists, delivery has occurred, the license fee is fixed or determinable, and collection is probable. In software arrangements that include rights to multiple software products and/or services, the total arrangement fee is allocated using the residual method. Under this method, revenue is allocated to the undelivered elements based on vendor-specific objective evidence (VSOE) of the fair value of such undelivered elements and the residual amounts of revenue are allocated to the delivered elements. Elements included in multiple element arrangements may consist of software licenses, maintenance (which includes customer support services and unspecified upgrades), hosting, and consulting services. VSOE is based on the price generally charged when an element is sold separately or, in the case of an element not yet sold separately, the price established by management, if it is probable that the price, once established, will not change once the element is sold separately. If VSOE does not exist for an undelivered element, the total arrangement fee will be recognized as revenue over the life of the contract or upon delivery of the undelivered element.

The Company offers multiple element arrangements 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. Deliverables of such multiple element arrangements are evaluated to determine the unit of accounting and if certain criteria are met, the Company allocates revenues to each unit of accounting based on its relative selling price. A hierarchy of selling prices is used to determine the selling price of each specific deliverable that includes VSOE (if available), third-party evidence (if VSOE is not available), or estimated selling price if neither of the first two is available. The estimated selling price reflects the Company's best estimate of what the selling prices of elements would be if the elements were sold on a stand-alone basis. Revenue is allocated between the elements of an arrangement at the inception of the arrangement. Such arrangements generally include industry-specific performance and termination provisions, such as in the event of substantial delays or non-delivery.

Revenues are reported net of customer rebates and similar incentives. 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.

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 in certain circumstances (for example, where the completed-contract method of revenue recognition is used) 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 assessed for impairment when events or circumstances indicate that the carrying amount of the asset may not be recoverable. If the asset's net carrying value exceeds the asset's net undiscounted cash flows expected to be generated over its remaining useful life including net proceeds expected from disposition of the asset, if any, the carrying amount of the asset 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 other 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 review in 2017, the reporting units were the same as the operating segments for Electrification Products, Robotics and Motion and Power Grids, while for the Industrial Automation operating segment, the reporting units were determined to be one level below the operating segment.

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 (described below) 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.

The quantitative impairment test calculates the fair value of a reporting unit (based on the income approach whereby the fair value of a reporting unit is calculated based on the present value of future cash flows) 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.

Capitalized software costs

Software for internal use

Costs incurred in the application development stage until the software is substantially complete are capitalized and are amortized on a straight-line basis over the estimated useful life of the software, typically ranging from 3 to 5 years.

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 5).

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). The ineffective portion of a derivative's change in fair value is immediately recognized in earnings consistent with the classification of the hedged item. 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 balance sheet 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 used in investing activities”.

Leases

The Company leases primarily real estate, vehicles and office equipment. Rental expense for operating leases is recorded on a straight-line basis over the life of the lease term. Lease transactions where substantially all risks and rewards incident to ownership are transferred from the lessor to the lessee are accounted for as capital leases. All other leases are accounted for as operating leases. Amounts due under capital leases are recorded as a liability. The interest in assets acquired under capital leases is recorded as property, plant and equipment. Depreciation and amortization of assets recorded under capital leases is included in depreciation and amortization expense.

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 recognized in earnings are included in “Total revenues”, “Total cost of sales”, “Selling, general and administrative expenses” or “Interest and other finance expense” consistent with the nature of the underlying item.

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 for events such as tax claims or changes in tax laws. 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.

The expense related to tax penalties is classified in the Consolidated Income Statements as “Provision for taxes”, while interest thereon is classified as “Interest and other finance expense”.

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 include: 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 models) 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 reliability 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, reverse repurchase agreements, certain debt securities that are not actively traded, 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).

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 6.

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 provides for anticipated costs for warranties when it recognizes revenues on the related products or contracts. 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 and other postretirement plans. 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 other 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. These estimates 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. 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.

New accounting pronouncements

Applicable for current period

Balance sheet classification of deferred taxes

As of January 1, 2017, the Company adopted an accounting standard update removing the requirement to separate deferred tax liabilities and assets into current and noncurrent amounts and instead requiring all such amounts, as well as any related valuation allowance, to be classified as noncurrent in the consolidated balance sheets. This update was applied retrospectively and resulted in a decrease of \$297 million in both the total deferred tax assets and total deferred tax liabilities at December 31, 2016, due to additional netting impacts.

Simplifying the transition to the equity method of accounting

As of January 1, 2017, the Company adopted an accounting standard update eliminating the retroactive adjustments to an investment upon it qualifying for the equity method of accounting as a result of an increase in the level of ownership interest or degree of influence by the investor. It requires that the equity method investor add the cost of acquiring the additional interest in the investee to the current basis of the investor's previously held interest and adopt the equity method of accounting as of the date the investment qualifies for equity method accounting. This update was applied prospectively and did not have a significant impact on the consolidated financial statements.

Improvements to employee share-based payment accounting

As of January 1, 2017, the Company adopted an accounting standard update which changed the accounting for certain aspects of share-based payment awards to employees, including the accounting for income taxes, forfeitures, and statutory tax withholding requirements, as well as the classification in the statement of cash flows. This update did not have a significant impact on the consolidated financial statements.

Simplifying the test for goodwill impairment

As of January 1, 2017, the Company early-adopted an accounting standard update eliminating the requirement to calculate the implied fair value of goodwill when measuring a goodwill impairment loss. Instead the Company is now required to record an impairment loss based on the excess of a reporting unit's carrying amount over its fair value provided that the loss recognized does not exceed the total amount of goodwill allocated to that reporting unit. This update was applied prospectively and did not have a significant impact on the consolidated financial statements.

Applicable for future periods

Revenue from contracts with customers

In May 2014, an accounting standard update was issued to clarify the principles for recognizing revenues from contracts with customers. The update, which supersedes substantially all existing revenue recognition guidance, provides a single comprehensive model for recognizing revenues on the transfer of promised goods or services to customers in an amount that reflects the consideration that is expected to be received for those goods or services. Under the standard it is possible that more judgments and estimates would be required than under existing standards, including identifying the separate performance obligations in a contract, estimating any variable consideration elements, and allocating the transaction price to each separate performance obligation. The update also requires additional disclosures about the nature, amount, timing and uncertainty of revenue and cash flows arising from contracts with customers. Further updates were issued in 2016 to clarify the guidance on identifying performance obligations, licensing and contract costs, to enhance the implementation guidance on principal versus agent considerations and to add other practical expedients.

In August 2015, the effective date for the update was deferred and the update is now effective for the Company for annual and interim periods beginning January 1, 2018, and is to be applied either (i) retrospectively to each prior reporting period presented, with the option to elect certain defined practical expedients, or (ii) retrospectively with the cumulative effect of initially applying the update recognized at the date of adoption in retained earnings (with additional disclosure as to the impact on individual financial statement lines affected). Early adoption of the standard is permitted for annual reporting periods beginning after December 15, 2016, including interim reporting periods within that reporting period.

The Company will adopt these updates as of January 1, 2018, pursuant to the aforementioned adoption method (ii), applying them to contracts that are not completed contracts at that date, and will elect the practical expedient for contract modifications.

The Company's analysis of contracts resulted in only immaterial differences between the identification of performance obligations and the current unit of accounting determination. Except for a limited number of contracts where the required criteria are not met, the analysis supports the recognition of revenue over time following the cost-to-cost method under the new revenue recognition standard for those contracts which are following the cost-to-cost method under the current revenue recognition model. The Company does not expect to record a significant cumulative adjustment to retained earnings as of January 1, 2018, however, the Company expects the adoption will increase total assets and total liabilities by approximately \$200 million due to the reclassification of certain advances from customers, currently reported as a reduction of inventory, to liabilities.

Recognition and measurement of financial assets and financial liabilities

In January 2016, an accounting standard update was issued to enhance the reporting model for financial instruments, which includes amendments to address aspects of recognition, measurement, presentation and disclosure. For example, the Company would be required to measure equity investments (except those accounted for under the equity method) at fair value with changes in fair value recognized in net income and to present separately financial assets and financial liabilities by measurement category and form of financial asset. This update is effective for the Company for annual and interim periods beginning January 1, 2018, with early adoption permitted for certain provisions. The Company does not believe that this update will have a significant impact on its consolidated financial statements.

Leases

In February 2016, an accounting standard update was issued that requires lessees to recognize lease assets and corresponding lease liabilities on the balance sheet for all leases with terms of more than 12 months. The update, which supersedes existing lease guidance, will continue to classify leases as either finance or operating, with the classification determining the pattern of expense recognition in the income statement. This update is effective for the Company for annual and interim periods beginning January 1, 2019, with early adoption permitted, and is applicable on a modified retrospective basis with various optional practical expedients. The Company is currently evaluating the impact of this update on its consolidated financial statements.

Measurement of credit losses on financial instruments

In June 2016, an accounting standard update was issued which replaces the existing incurred loss impairment methodology for most financial assets with a new “current expected credit loss” model. The new model will result in the immediate recognition of the estimated credit losses expected to occur over the remaining life of financial assets such as trade and other receivables, held-to-maturity debt securities, loans and other instruments. Credit losses relating to available-for-sale debt securities will be measured in a manner similar to current GAAP, except that the losses will be recorded through an allowance for credit losses rather than as a direct write-down of the security.

This update is effective for the Company for annual and interim periods beginning January 1, 2020, with early adoption permitted for annual and interim periods beginning January 1, 2019. The Company is currently evaluating the impact of this update on its consolidated financial statements.

Classification of certain cash receipts and cash payments in the statement of cash flows

In August 2016, an accounting standard update was issued which clarifies how certain cash receipts and cash payments, including debt prepayment or extinguishment costs, the settlement of zero coupon debt instruments, contingent consideration paid after a business combination, proceeds from insurance settlements, distributions from certain equity method investees and beneficial interests obtained in a financial asset securitization, should be presented and classified in the statement of cash flows. This update is effective for the Company for annual and interim periods beginning January 1, 2018, on a retrospective basis, with early adoption permitted. The Company does not believe that this update will have a significant impact on its consolidated financial statements.

Income taxes – Intra-entity transfers of assets other than inventory

In October 2016, an accounting standard update was issued that requires the Company to recognize the income tax consequences of an intra-entity transfer of an asset other than inventory when the transfer occurs instead of when the asset has been sold to an outside party. This update is effective for the Company for annual and interim periods beginning January 1, 2018, with early adoption permitted, and is applicable on a modified retrospective basis through a cumulative-effect adjustment directly to retained earnings as of the beginning of the period of adoption. The Company will adopt this update as of January 1, 2018, and expects to record a net reduction in deferred tax assets of approximately \$215 million with a corresponding reduction in retained earnings as of this date.

Statement of cash flows – Restricted cash

In November 2016, an accounting standard update was issued which clarifies the classification and presentation of changes in restricted cash on the statement of cash flows. It requires the inclusion of cash and cash equivalents that have restrictions on withdrawal or use in total cash and cash equivalents on the statement of cash flows. This update is effective for the Company for annual and interim periods beginning January 1, 2018, on a retrospective basis, with early adoption permitted. The Company does not believe that this update will have a significant impact on its consolidated financial statements.

Clarifying the definition of a business

In January 2017, an accounting standard update was issued which narrows the definition of a business. It also provides a framework for determining whether a set of transferred assets and activities involves a business. This update is effective for the Company for annual and interim periods beginning January 1, 2018, on a prospective basis, with early adoption permitted. The Company does not believe that this update will have a significant impact on its consolidated financial statements.

Clarifying the scope of asset derecognition guidance and accounting for partial sales of nonfinancial assets

In February 2017, an accounting standard update was issued which clarifies the scope of asset derecognition guidance, adds guidance for partial sales of nonfinancial assets and clarifies recognizing gains and losses from the transfer of nonfinancial assets in contracts with noncustomers. The Company plans to adopt this update retrospectively as of January 1, 2018, with the cumulative effect of initially applying the update recognized at the date of adoption in retained earnings. The Company does not believe that this update will have a significant impact on its consolidated financial statements.

Improving the presentation of net periodic pension cost and net periodic postretirement benefit cost

In March 2017, an accounting standard update was issued which changes how employers that sponsor defined benefit pension plans and other postretirement plans present the net periodic benefit cost in the income statement. Under this update, the Company will be required to report the service cost component in the same line item or items as other compensation costs arising from services rendered by the pertinent employees during the period. Other components of net benefit will be required to be presented in the income statement separately from the service cost component and outside the subtotal of income from operations. Under the amendment only the current service cost component is allowed to be capitalized. This update is effective for the Company for annual and interim periods beginning January 1, 2018, on a retrospective basis for the presentation requirements and on a prospective basis for the capitalization of the current service cost component requirements. The Company will adopt this update as of January 1, 2018, and expects to reclassify income of \$42 million and expenses of \$38 million to be presented outside of income from operations for the year ended December 31, 2017 and 2016, respectively, and estimates that for 2018 approximately \$100 million of income will be presented outside income from operations relating to net periodic pension costs.

Compensation—Stock compensation

In May 2017, an accounting standard update was issued which clarifies when to account for a change to the terms or conditions of a share-based payment award as a modification. Under this update, modification accounting is required only if the fair value, the vesting conditions, or the classification of the award (as equity or liability) changes as a result of the change in terms or conditions. This update is effective prospectively and will apply to awards modified on or after January 1, 2018. The Company does not believe that this update will have a significant impact on its consolidated financial statements.

Derivatives and hedging—Targeted improvements to accounting for hedging activities

In August 2017, an accounting standard update was issued which expands and refines hedge accounting for both financial and non-financial risk components, aligns the recognition and presentation of the effects of hedging instruments and hedge items in the financial statements, and includes certain targeted improvements to ease the application of current guidance related to the assessment of hedge effectiveness. This update is effective for the Company for annual and interim periods beginning January 1, 2019. For cash flow and net investment hedges as of the adoption date, the guidance requires a modified retrospective approach. The amended presentation and disclosure guidance is required only prospectively. The Company will adopt this update as of January 1, 2019, and is currently evaluating the impact of this update on its consolidated financial statements.

Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income

In February 2018, an accounting standard update was issued which allows a reclassification to retained earnings of the tax effects stranded in accumulated other comprehensive income as a result of complying with the Tax Cuts and Jobs Act of 2017 (the Tax Act). This update is effective for the Company for annual and interim periods beginning January 1, 2019, with early adoption in any interim period permitted. The updated guidance is to be applied in the period of adoption or retrospectively to each period in which the effect of the Tax Act related to items remaining in accumulated other comprehensive income are recognized. The Company is currently evaluating the impact of this update on its consolidated financial statements.

Note 3—Acquisitions and business divestments

Acquisitions

Acquisitions were as follows:

(\$ in millions, except number of acquired businesses)	2017	2016	2015
Acquisitions (net of cash acquired) ⁽¹⁾	2,111	13	37
Aggregate excess of purchase price over fair value of net assets acquired ⁽²⁾	1,337	12	34
Number of acquired businesses	5	1	3

(1) Excluding changes in cost- and equity-accounted companies.

(2) Recorded as goodwill (see Note 11).

In the table above, the “Acquisitions” and “Aggregate excess of purchase price over fair value of net assets acquired” amounts for 2017, relate primarily to the acquisition of Bernecker + Rainer Industrie-Elektronik GmbH (B&R). In 2016 and 2015, acquisitions were not significant.

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.

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 assets and liabilities becomes available.

On July 6, 2017, the Company acquired the shares of B&R, a worldwide provider of product- and software-based, open-architecture solutions for machine and factory automation. This acquisition closes a gap in the Company’s industrial automation portfolio and consequently the goodwill acquired represents the future benefits associated with product portfolio expansion.

The aggregate preliminary allocation of the purchase consideration for business acquisitions in 2017, was as follows:

(\$ in millions)	<u>Allocated amounts</u>	<u>Weighted-average useful life</u>
Technology	434	7 years
Customer Relationships	292	19 years
Trade names	65	10 years
Order backlog	1	3 months
Intangible assets	792	
Fixed assets	131	
Debt acquired	(50)	
Deferred tax liabilities	(255)	
Inventories	177	
Other assets and liabilities, net	(21)	
Goodwill ⁽¹⁾	1,337	
Total consideration (net of cash acquired) ⁽²⁾	2,111	

(1) The Company does not expect the goodwill recognized to be deductible for income tax purposes.

(2) Primarily relates to the acquisition of B&R.

Business divestments

In 2017, the Company received proceeds (net of transaction costs and cash disposed) of \$605 million, relating to divestments of consolidated businesses and recorded net gains of \$252 million in “Other income (expense), net” on the sale of such businesses. These are primarily due to the divestment of the Company’s high-voltage cables and cable accessories businesses (the Cables business) in March 2017 and the divestment of the Oil & Gas EPC business in December 2017.

The Company has retained certain obligations of the Cables business and thus the Company remains directly or indirectly liable for these liabilities which existed at the date of the divestment. Subsequent to the divestment, the Company recorded a loss of \$94 million for changes in the amounts recorded for these obligations. In addition, the Company has provided certain performance guarantees to third parties which guarantee the performance of the buyer under existing contracts with customers as well as for certain capital expenditures of the divested business.

In 2016 and 2015, there were no significant amounts recognized from divestments of consolidated businesses.

Planned acquisition of GE Industrial Solutions

On September 25, 2017, the Company announced that it had reached an agreement to acquire General Electric Company’s (GE) Industrial Solutions business, GE’s global electrification solutions business, for \$2.6 billion. The Company expects to close the acquisition of GE Industrial Solutions in the first half of 2018, following the receipt of customary regulatory approvals.

Note 4—Cash and equivalents, marketable securities and short-term investments

Current assets

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

(\$ in millions)	December 31, 2017					Marketable securities and short-term investments
	Cost basis	Gross unrealized gains	Gross unrealized losses	Fair value	Cash and equivalents	
	Cash	1,963			1,963	
Time deposits	2,853			2,853	2,563	290
Other short-term investments	305			305		305
<i>Debt securities available-for-sale:</i>						
—U.S. government obligations	127	—	(2)	125	—	125
—Other government obligations	2	—	—	2	—	2
—Corporate	215	1	(1)	215	—	215
Equity securities available-for-sale	152	13	—	165	—	165
Total	5,617	14	(3)	5,628	4,526	1,102

(\$ in millions)	December 31, 2016					Marketable securities and short-term investments
	Cost basis	Gross unrealized gains	Gross unrealized losses	Fair value	Cash and equivalents	
	Cash	1,704			1,704	
Time deposits	2,764			2,764	1,940	824
Other short-term investments	271			271		271
<i>Debt securities available-for-sale:</i>						
—U.S. government obligations	221	1	(2)	220	—	220
—Other government obligations	2	—	—	2	—	2
—Corporate	95	1	(1)	95	—	95
Equity securities available-for-sale	530	11	—	541	—	541
Total	5,587	13	(3)	5,597	3,644	1,953

Included in Other short-term investments at December 31, 2017 and 2016, are receivables of \$305 million and \$268 million, respectively, representing reverse repurchase agreements. These collateralized lendings, made to a financial institution, have maturity dates of less than one year.

Contractual maturities

Contractual maturities of debt securities consisted of the following:

(\$ in millions)	December 31, 2017			
	Available-for-sale		Held-to-maturity	
	Cost basis	Fair value	Cost basis	Fair value
Less than one year	122	122	3	3
One to five years	161	160	71	77
Six to ten years	59	58	—	—
Due after ten years	2	2	—	—
Total	344	342	74	80

At December 31, 2017 and 2016, the Company pledged \$66 million and \$91 million, respectively, of available-for-sale marketable securities as collateral for issued letters of credit and other security arrangements.

Note 5—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 other than electricity, 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 are used to manage the interest rate 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 MIP. 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,		
	2017	2016	2015
Foreign exchange contracts	17,280	15,353	16,467
Embedded foreign exchange derivatives	1,641	2,162	2,966
Interest rate contracts	5,706	3,021	4,302

Derivative commodity contracts

The following table shows the notional amounts of outstanding commodity derivatives (whether designated as hedges or not), on a net basis, to reflect the Company's requirements in the various commodities:

Type of derivative	Unit	Total notional amounts at December 31,		
		2017	2016	2015
Copper swaps	metric tonnes	44,145	47,425	48,903
Aluminum swaps	metric tonnes	7,700	4,650	5,455
Nickel swaps	metric tonnes	12	—	18
Lead swaps	metric tonnes	—	15,100	14,625
Zinc swaps	metric tonnes	425	150	225
Silver swaps	ounces	1,966,729	1,586,395	1,727,255
Crude oil swaps	barrels	170,331	121,000	133,500

Equity derivatives

At December 31, 2017, 2016 and 2015, the Company held 37 million, 47 million and 55 million cash-settled call options indexed to ABB Ltd shares (conversion ratio 5:1) with a total fair value of \$42 million, \$23 million and \$13 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. Where such instruments are designated and qualify as cash flow hedges, 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. Any ineffectiveness in the hedge relationship, or hedge component excluded from the assessment of effectiveness, is recognized in earnings during the current period.

At December 31, 2017, 2016 and 2015, "Accumulated other comprehensive loss" included net unrealized gains of \$12 million and net unrealized losses of \$1 million and \$11 million, respectively, net of tax, on derivatives designated as cash flow hedges. Of the amount at December 31, 2017, net gains of \$11 million are expected to be reclassified to earnings in 2018. At December 31, 2017, the longest maturity of a derivative classified as a cash flow hedge was 32 months.

In 2017, 2016 and 2015, the amounts of gains or losses, net of tax, reclassified into earnings due to the discontinuance of cash flow hedge accounting and the amount of ineffectiveness in cash flow hedge relationships directly recognized in earnings were not significant.

The pre-tax effects of derivative instruments, designated and qualifying as cash flow hedges, on “Accumulated other comprehensive loss” (OCI) and the Consolidated Income Statements were as follows:

(\$ in millions)	Gains (losses) recognized in OCI on derivatives (effective portion)			Location	Gains (losses) reclassified from OCI into income (effective portion)		
	2017	2016	2015		2017	2016	2015
Type of derivative							
Foreign exchange contracts	11	2	(11)	Total revenues	(1)	(11)	(36)
				Total cost of sales	3	10	11
Commodity contracts	12	4	(9)	Total cost of sales	8	(2)	(10)
Cash-settled call options	22	15	(6)	SG&A expenses ⁽¹⁾	16	10	(4)
Total	45	21	(26)		26	7	(39)

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

The amounts in respect of gains (losses) recognized in income for hedge ineffectiveness and amounts excluded from effectiveness testing were not significant in 2017, 2016 and 2015.

Net derivative gains of \$22 million and \$6 million and net derivative losses of \$30 million, net of tax, were reclassified from “Accumulated other comprehensive loss” to earnings during 2017, 2016 and 2015, respectively.

Fair value hedges

To reduce its interest rate exposure arising primarily from its debt issuance activities, the Company uses 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 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”. Hedge ineffectiveness of instruments designated as fair value hedges in 2017, 2016 and 2015, was not significant.

The effect of Interest rate contracts, designated and qualifying as fair value hedges, on the Consolidated Income Statements was as follows:

(\$ in millions)	2017	2016	2015
Gains (losses) recognized in Interest and other finance expense:			
- on derivatives designated as fair value hedges	(25)	(28)	8
- on hedged item	29	30	(4)

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) Type of derivative not designated as a hedge	Gains (losses) recognized in income			
	Location	2017	2016	2015
Foreign exchange contracts	Total revenues	147	(206)	(216)
	Total cost of sales	(44)	(56)	16
	SG&A expenses ⁽¹⁾	(18)	8	13
	Non-order related research and development	—	(2)	(1)
	Other income (expense), net	(1)	22	—
	Interest and other finance expense	22	(34)	287
Embedded foreign exchange contracts	Total revenues	(2)	(5)	127
	Total cost of sales	(4)	(5)	(25)
	SG&A expenses ⁽¹⁾	5	(2)	(5)
Commodity contracts	Total cost of sales	53	42	(61)
Other	Interest and other finance expense	(2)	4	(1)
Total		156	(234)	134

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

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

(\$ in millions)	December 31, 2017			
	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”
<i>Derivatives designated as hedging instruments:</i>				
Foreign exchange contracts	4	—	3	1
Commodity contracts	6	—	—	—
Interest rate contracts	—	42	—	4
Cash-settled call options	25	16	—	—
Total	35	58	3	5
<i>Derivatives not designated as hedging instruments:</i>				
Foreign exchange contracts	142	25	190	63
Commodity contracts	35	1	6	—
Cross-currency interest rate swaps	—	—	2	—
Cash-settled call options	—	1	—	—
Embedded foreign exchange derivatives	32	16	22	7
Total	209	43	220	70
Total fair value	244	101	223	75

December 31, 2016

(\$ in millions)	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"
<i>Derivatives designated as hedging instruments:</i>				
Foreign exchange contracts	5	—	6	5
Commodity contracts	2	—	—	—
Interest rate contracts	2	62	—	—
Cash-settled call options	13	9	—	—
Total	22	71	6	5
<i>Derivatives not designated as hedging instruments:</i>				
Foreign exchange contracts	169	29	257	77
Commodity contracts	29	2	6	1
Cross-currency interest rate swaps	—	2	—	—
Cash-settled call options	—	1	—	—
Embedded foreign exchange derivatives	58	21	35	18
Total	256	55	298	96
Total fair value	278	126	304	101

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, 2017 and 2016, 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, 2017 and 2016, information related to these offsetting arrangements was as follows:

(\$ in millions)	December 31, 2017				
	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
Type of agreement or similar arrangement					
Derivatives	297	(172)	—	—	125
Reverse repurchase agreements	305	—	—	(305)	—
Total	602	(172)	—	(305)	125

(\$ in millions)	December 31, 2017				
	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
Type of agreement or similar arrangement					
Derivatives	269	(172)	—	—	97
Total	269	(172)	—	—	97

(\$ in millions)	December 31, 2016				
	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
Type of agreement or similar arrangement					
Derivatives	325	(190)	—	—	135
Reverse repurchase agreements	268	—	—	(268)	—
Total	593	(190)	—	(268)	135

(\$ in millions)	December 31, 2016				
	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
Type of agreement or similar arrangement					
Derivatives	352	(190)	—	—	162
Total	352	(190)	—	—	162

Note 6—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:

(\$ in millions)	December 31, 2017			
	Level 1	Level 2	Level 3	Total fair value
Assets				
Available-for-sale securities in “Marketable securities and short-term investments”:				
Equity securities	—	165	—	165
Debt securities—U.S. government obligations	125	—	—	125
Debt securities—Other government obligations	—	2	—	2
Debt securities—Corporate	—	215	—	215
Receivable in “Other non-current assets”:				
Receivable under securities lending arrangement	79	—	—	79
Derivative assets—current in “Other current assets”	—	244	—	244
Derivative assets—non-current in “Other non-current assets”	—	101	—	101
Total	204	727	—	931
Liabilities				
Derivative liabilities—current in “Other current liabilities”	—	223	—	223
Derivative liabilities—non-current in “Other non-current liabilities”	—	75	—	75
Total	—	298	—	298
	December 31, 2016			
(\$ in millions)	Level 1	Level 2	Level 3	Total fair value
Assets				
Available-for-sale securities in “Marketable securities and short-term investments”:				
Equity securities	—	541	—	541
Debt securities—U.S. government obligations	220	—	—	220
Debt securities—Other government obligations	—	2	—	2
Debt securities—Corporate	—	95	—	95
Derivative assets—current in “Other current assets”	—	278	—	278
Derivative assets—non-current in “Other non-current assets”	—	126	—	126
Total	220	1,042	—	1,262
Liabilities				
Derivative liabilities—current in “Other current liabilities”	—	304	—	304
Derivative liabilities—non-current in “Other non-current liabilities”	—	101	—	101
Total	—	405	—	405

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:

- *Available-for-sale securities in “Cash and equivalents” and “Marketable securities and short-term investments” and “Other non-current assets”*: 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 nonperformance risk. The inputs used in present value techniques are observable and fall into the Level 2 category. The fair value of the receivable under the securities lending arrangement has been determined based on the fair value of the security lent.
- *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

There were no significant non-recurring fair value measurements during 2017 and 2016.

Disclosure about financial instruments carried on a cost basis

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

(\$ in millions)	December 31, 2017				Total fair value
	Carrying value	Level 1	Level 2	Level 3	
Assets					
Cash and equivalents (excluding available-for-sale securities with original maturities up to 3 months):					
Cash	1,963	1,963	—	—	1,963
Time deposits	2,563	—	2,563	—	2,563
Marketable securities and short-term investments (excluding available-for-sale securities):					
Time deposits	290	—	290	—	290
Receivables under reverse repurchase agreements	305	—	305	—	305
Other non-current assets:					
Loans granted	32	—	33	—	33
Restricted cash and cash deposits	38	38	—	—	38
Liabilities					
Short-term debt and current maturities of long-term debt (excluding capital lease obligations)					
	704	400	304	—	704
Long-term debt (excluding capital lease obligations)	6,569	6,046	775	—	6,821

(\$ in millions)	December 31, 2016				Total fair value
	Carrying value	Level 1	Level 2	Level 3	
Assets					
Cash and equivalents (excluding available-for-sale securities with original maturities up to 3 months):					
Cash	1,704	1,704	—	—	1,704
Time deposits	1,940	—	1,940	—	1,940
Marketable securities and short-term investments (excluding available-for-sale securities):					
Time deposits	824	—	824	—	824
Receivables under reverse repurchase agreements	268	—	268	—	268
Other short-term investments	3	3	—	—	3
Other non-current assets:					
Loans granted	30	—	31	—	31
Restricted cash and cash deposits	59	59	—	—	59
Liabilities					
Short-term debt and current maturities of long-term debt (excluding capital lease obligations)					
	980	856	124	—	980
Long-term debt (excluding capital lease obligations)					
	5,709	5,208	784	—	5,992

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

- *Cash and equivalents (excluding available-for-sale securities with original maturities up to 3 months), and Marketable securities and short-term investments (excluding available-for-sale securities):* The carrying amounts approximate the fair values as the items are short-term in nature.
- *Other non-current assets:* Includes (i) loans granted whose fair values are based on the carrying amount adjusted using a present value technique to reflect a premium or discount based on current market interest rates (Level 2 inputs), (ii) restricted cash whose fair values approximate the carrying amounts (Level 1 inputs).
- *Short-term debt and current maturities of long-term debt (excluding capital 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 capital lease obligations, approximate their fair values.
- *Long-term debt (excluding capital 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 7—Receivables, net

“Receivables, net” consisted of the following:

(\$ in millions)	December 31,	
	2017	2016
Trade receivables	7,883	7,293
Other receivables	714	587
Allowance	(330)	(314)
	8,267	7,566
<i>Unbilled receivables, net:</i>		
Costs and estimated profits in excess of billings	3,024	3,058
Advance payments consumed	(875)	(928)
	2,149	2,130
Total	10,416	9,696

“Trade receivables” in the table above includes contractual retention amounts billed to customers of \$541 million and \$463 million at December 31, 2017 and 2016, 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, 2017, 69 percent and 26 percent are expected to be collected in 2018 and 2019, respectively.

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

“Costs and estimated profits in excess of billings” in the table above represents revenues earned and recognized for contracts under the percentage-of-completion or completed-contract method of accounting. Management expects that the majority of the amounts will be collected within one year of the respective balance sheet date.

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

(\$ in millions)	2017	2016	2015
Balance at January 1,	314	258	279
Additions	109	163	118
Deductions	(111)	(96)	(113)
Exchange rate differences	18	(11)	(26)
Balance at December 31,	330	314	258

Note 8—Inventories, net

“Inventories, net” consisted of the following:

(\$ in millions)	December 31,	
	2017	2016
Raw materials	1,943	1,692
Work in process	1,595	1,326
Finished goods	1,563	1,369
Advances to suppliers	154	149
	5,255	4,536
Advance payments consumed	(196)	(189)
Total	5,059	4,347

“Work in process” in the table above contains inventoried costs relating to long-term contracts of \$176 million and \$212 million at December 31, 2017 and 2016, respectively. “Advance payments consumed” in the table above relates to contractual advances received from customers on work in process.

Note 9—Other non-current assets

“Other non-current assets” consisted of the following:

(\$ in millions)	December 31,	
	2017	2016
Pledged financial assets	100	112
Derivatives (including embedded derivatives) (see Note 5)	101	126
Receivable under securities lending arrangement	79	—
Investments	72	57
Restricted cash	38	59
Other	197	178
Total	587	532

The Company entered into structured leasing transactions with U.S. investors prior to 1999. At the inception of the leasing arrangements the Company placed certain amounts in restricted cash deposits and held-to-maturity debt securities. These amounts, included as “Pledged financial assets” in the table above, are pledged as security for certain outstanding deposit liabilities included in “Other non-current liabilities” (see Note 13) and the funds received upon maturity of the respective pledged financial assets will only be available to the Company for repayment of these obligations.

“Investments” represents shares and other equity investments carried at cost.

Note 10—Property, plant and equipment, net

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

(\$ in millions)	December 31,	
	2017	2016
Land and buildings	4,282	3,786
Machinery and equipment	8,336	7,368
Construction in progress	700	515
	13,318	11,669
Accumulated depreciation	(7,955)	(6,926)
Total	5,363	4,743

Assets under capital leases included in “Property, plant and equipment, net” were as follows:

(\$ in millions)	December 31,	
	2017	2016
Land and buildings	176	120
Machinery and equipment	85	47
	261	167
Accumulated depreciation	(120)	(82)
Total	141	85

In 2017, 2016 and 2015, depreciation, including depreciation of assets under capital leases, was \$750 million, \$767 million and \$764 million, respectively.

Note 11—Goodwill and other intangible assets

The changes in “Goodwill” below have been recast to reflect the reorganization of the Company’s operating segments as outlined in Note 23:

(\$ in millions)	Electrification	Robotics	Industrial	Power	Corporate	Total
	Products	and Motion	Automation	Grids	and Other	
Cost at January 1, 2016	2,824	3,557	1,606	1,558	144	9,689
Accumulated impairment charges	—	—	—	—	(18)	(18)
Balance at January 1, 2016	2,824	3,557	1,606	1,558	126	9,671
Goodwill acquired during the year	—	12	—	—	—	12
Goodwill allocated to assets held for sale	—	—	—	—	(105)	(105)
Exchange rate differences and other	(19)	(33)	(14)	(11)	—	(77)
Balance at December 31, 2016	2,805	3,536	1,592	1,547	21	9,501
Goodwill acquired during the year	—	4	1,263	70	—	1,337
Goodwill allocated to disposals	—	—	(1)	—	(1)	(2)
Exchange rate differences and other	164	67	85	46	1	363
Balance at December 31, 2017	2,969	3,607	2,939	1,663	21	11,199

In 2017, goodwill acquired primarily relates to B&R, acquired in July, 2017, which has been allocated to the Industrial Automation operating segment.

In 2016, goodwill allocated to the high-voltage cable system business, within Corporate and Other (formerly reported in the Power Grids operating segment), was transferred to “Assets held for sale”. The sale was completed in March 2017, see Note 3 for details.

Intangible assets other than goodwill consisted of the following:

(\$ in millions)	December 31,					
	2017			2016		
	Gross carrying amount	Accumulated amortization	Net carrying amount	Gross carrying amount	Accumulated amortization	Net carrying amount
Capitalized software for internal use	787	(646)	141	712	(596)	116
Capitalized software for sale	453	(412)	41	409	(365)	44
<i>Intangibles other than software:</i>						
Customer-related	2,861	(1,084)	1,777	2,500	(904)	1,596
Technology-related	1,239	(760)	479	755	(660)	95
Marketing-related	371	(202)	169	291	(159)	132
Other	38	(23)	15	34	(21)	13
Total	5,749	(3,127)	2,622	4,701	(2,705)	1,996

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

(\$ in millions)	2017	2016
Capitalized software for internal use	71	39
Capitalized software for sale	22	18
<i>Intangibles other than software:</i>		
Customer-related	293	—
Technology-related	437	1
Marketing-related	65	—
Total	888	58

Included in the additions of \$888 million in 2017, were the following intangible assets other than goodwill related to business combinations:

(\$ in millions)	2017	
	Amount acquired	Weighted-average useful life
<i>Intangibles other than software:</i>		
Customer-related ⁽¹⁾	293	19 years
Technology-related	434	7 years
Marketing-related	65	10 years
Total	792	

(1) Includes the fair value of order backlog acquired in business combinations.

There were no significant intangible assets acquired in business combinations during 2016.

Amortization expense of intangible assets other than goodwill consisted of the following:

(\$ in millions)	2017	2016	2015
Capitalized software for internal use	54	57	60
Capitalized software for sale	26	25	21
Intangibles other than software	271	287	315
Total	351	369	396

In 2017, 2016 and 2015, impairment charges on intangible assets other than goodwill were not significant.

At December 31, 2017, future amortization expense of intangible assets other than goodwill is estimated to be:

	(\$ in millions)
2018	371
2019	326
2020	296
2021	262
2022	149
Thereafter	1,218
Total	2,622

Note 12—Debt

The Company's total debt at December 31, 2017 and 2016, amounted to \$7,447 million and \$6,803 million, respectively.

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

The Company's "Short-term debt and current maturities of long-term debt" consisted of the following:

(\$ in millions)	December 31,	
	2017	2016
Short-term debt (weighted-average interest rate of 2.7% and 3.3%, respectively)	327	135
Current maturities of long-term debt (weighted-average nominal interest rate of 2.0% and 2.8%, respectively)	411	868
Total	738	1,003

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

At December 31, 2017, the Company had in place two commercial paper programs: 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, 2017 and 2016, \$259 million and \$57 million, respectively, was outstanding under the \$2 billion program in the United States.

In addition, the Company has a \$2 billion multicurrency revolving credit facility, maturing in 2021, for general corporate purposes. Interest costs on drawings under the facility are LIBOR or EURIBOR (depending on the currency of the drawings) plus a margin of 0.20 percent, while commitment fees (payable on the unused portion of the facility) amount to 35 percent of the margin, which represents commitment fees of 0.07 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. No amount was drawn at December 31, 2017 and 2016. 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.

Long-term debt

The Company utilizes derivative instruments to modify the interest characteristics of its long-term debt. In particular, the Company uses interest rate swaps to effectively convert certain fixed-rate long-term debt into floating rate obligations. 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 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:

(\$ in millions, except % data)	December 31,					
	2017			2016		
	Balance	Nominal rate	Effective rate	Balance	Nominal rate	Effective rate
Floating rate	3,213	1.7%	0.6%	1,745	2.0%	1.3%
Fixed rate	3,907	3.5%	3.5%	4,923	2.9%	2.9%
	7,120			6,668		
Current portion of long-term debt	(411)	2.0%	2.0%	(868)	2.8%	2.4%
Total	6,709			5,800		

At December 31, 2017, the principal amounts of long-term debt repayable (excluding capital lease obligations) at maturity were as follows:

	(\$ in millions)
2018	378
2019	1,553
2020	5
2021	1,275
2022	1,257
Thereafter	2,485
Total	6,953

Details of the Company's outstanding bonds were as follows:

	December 31,				
	2017		2016		
	Nominal outstanding	Carrying value ⁽¹⁾	Currency	Nominal outstanding	Carrying value ⁽¹⁾
	(in millions)			(in millions)	
<i>Bonds:</i>					
1.625% USD Notes, due 2017		—	USD	500	\$ 500
4.25% AUD Notes, due 2017		—	AUD	400	\$ 291
1.50% CHF Bonds, due 2018	CHF	350	CHF	350	\$ 342
2.625% EUR Instruments, due 2019	EUR	1,250	EUR	1,250	\$ 1,311
4.0% USD Notes, due 2021	USD	650	USD	650	\$ 643
2.25% CHF Bonds, due 2021	CHF	350	CHF	350	\$ 368
5.625% USD Notes, due 2021	USD	250	USD	250	\$ 274
2.875% USD Notes, due 2022	USD	1,250	USD	1,250	\$ 1,268
0.625% EUR Notes, due 2023	EUR	700	EUR	700	\$ 732
0.75% EUR Notes, due 2024	EUR	750			—
4.375% USD Notes, due 2042	USD	750	USD	750	\$ 722
Total		\$ 6,845			\$ 6,451

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

During 2017, the Company repaid at maturity the 1.625% USD Notes, due 2017, and the 4.25% AUD Notes, due 2017. The Company had entered into interest rate swaps to hedge its interest obligation on the 4.25% AUD Notes, due 2017. After considering the impact of such swaps, these bonds effectively became floating rate Australian dollar obligations and consequently have been shown as floating rate debt at December 31, 2016, in the table of long-term debt above.

The 1.50% CHF Bonds, due 2018, pay interest annually in arrears at a fixed annual rate of 1.5 percent. The Company has the option to redeem the bonds prior to maturity, in whole, at par plus accrued interest, if 85 percent of the aggregate principal amount of the bonds has been redeemed or purchased and cancelled.

The 2.625% EUR Instruments, due 2019, pay interest annually in arrears at a fixed rate of 2.625 percent per annum.

The 4.0% USD Notes, due 2021, pay interest semi-annually in arrears, at a fixed annual rate of 4.0 percent, respectively. 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.

The 2.25% CHF Bonds, due 2021, pay interest annually in arrears, at a fixed annual rate of 2.25 percent, respectively. The Company has the option to redeem the bonds prior to maturity, in whole, at par plus accrued interest, if 85 percent of the aggregate principal amount of the bonds has been redeemed or purchased and cancelled. The Company entered into interest rate swaps to hedge its interest obligations on these bonds. After considering the impact of such swaps, these bonds effectively became floating rate Swiss franc obligations and consequently have been shown as floating rate debt in the table of long-term debt above.

The 5.625% USD Notes, due 2021, pay interest semi-annually in arrears at a fixed annual rate of 5.625 percent. The Company has the option to redeem the notes 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.

The 2.875% USD Notes, due 2022, pay interest semi-annually in arrears at a fixed annual rate of 2.875 percent. 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 any of 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 were 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 3-10 of Regulation S-X, the separate financial statements of ABB Finance (USA) Inc. are not provided. The Company has entered into interest rate swaps for an aggregate nominal amount of \$1,050 million to partially hedge its interest obligations on the 2.875% USD Notes, due 2022. After considering the impact of such swaps, \$1,050 million of the outstanding principal is shown as floating rate debt in the table of long-term debt above.

The 0.625% EUR Notes, due 2023, were issued in May 2016, with total net issuance proceeds of EUR 697 million (equivalent to approximately \$807 million on date of issuance). These Notes pay interest annually in arrears at a fixed rate of 0.625 percent per annum. In 2017, the Company entered into interest rate swaps to hedge its interest on 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 at December 31, 2017, in the table of long-term debt above.

In May 2017, the Company issued notes with an aggregate principal of EUR 750 million, due 2024. The notes pay interest annually in arrears at a fixed rate of 0.75 percent per annum. The Company recorded net proceeds (after underwriting fees) of EUR 745 million (equivalent to approximately \$824 million on date of issuance). The Company entered into interest rate swaps to hedge its interest on 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 Company's bonds 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, 2017 and 2016, are capital 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:

(\$ in millions)	December 31,	
	2017	2016
Contract-related provisions	857	673
Restructuring and restructuring-related provisions	467	577
Provisions for contractual penalties and compliance and litigation matters	240	210
Provision for insurance-related reserves	153	153
Other	165	152
Total	1,882	1,765

“Other current liabilities” consisted of the following:

(\$ in millions)	December 31,	
	2017	2016
Employee-related liabilities	1,871	1,670
Non-trade payables	552	394
Accrued expenses	508	413
Other tax liabilities	350	301
Income taxes payable	321	226
Accrued customer rebates	237	206
Derivative liabilities (see Note 5)	223	304
Deferred income	137	147
Accrued interest	62	67
Pension and other employee benefits (see Note 17)	47	59
Other	77	149
Total	4,385	3,936

“Other non-current liabilities” consisted of the following:

(\$ in millions)	December 31,	
	2017	2016
Income tax related liabilities	1,198	923
Provisions for contractual penalties and compliance and litigation matters	140	27
Non-current deposit liabilities (see Note 9)	95	106
Deferred income	82	80
Derivative liabilities (see Note 5)	75	101
Employee-related liabilities	75	66
Environmental provisions	53	62
Other	232	239
Total	1,950	1,604

Note 14—Leases

The Company's lease obligations primarily relate to real estate and office equipment. Rent expense was \$454 million, \$459 million and \$497 million in 2017, 2016 and 2015, respectively. Sublease income received by the Company on leased assets was \$11 million, \$13 million and \$13 million in 2017, 2016 and 2015, respectively.

At December 31, 2017, future net minimum lease payments for operating leases, having initial or remaining non-cancelable lease terms in excess of one year, consisted of the following:

	(\$ in millions)
2018	390
2019	301
2020	240
2021	176
2022	139
Thereafter	270
	<u>1,516</u>
Sublease income	<u>(17)</u>
Total	<u>1,499</u>

At December 31, 2017, the future net minimum lease payments for capital leases and the present value of the net minimum lease payments consisted of the following:

	(\$ in millions)
2018	48
2019	41
2020	30
2021	24
2022	22
Thereafter	127
Total minimum lease payments	<u>292</u>
Less amount representing estimated executory costs included in total minimum lease payments	<u>(2)</u>
Net minimum lease payments	<u>290</u>
Less amount representing interest	<u>(116)</u>
Present value of minimum lease payments	<u>174</u>

Minimum lease payments have not been reduced by minimum sublease rentals due in the future under non-cancelable subleases. Such minimum sublease rentals were not significant. The present value of minimum lease payments is included in "Short-term debt and current maturities of long-term debt" or "Long-term debt" in the Consolidated Balance Sheets.

Note 15—Commitments and contingencies

Contingencies—Regulatory, Compliance and Legal

Antitrust

In April 2014, the European Commission announced its decision regarding its investigation of anticompetitive practices in the cables industry and granted the Company full immunity from fines under the European Commission's leniency program. In December 2013, the Company agreed with the Brazilian Antitrust Authority (CADE) to settle its ongoing investigation into the Company's involvement in anticompetitive practices in the cables industry and the Company agreed to pay a fine of approximately 1.5 million Brazilian reais (equivalent to approximately \$1 million on date of payment).

In Brazil, the Company's Gas Insulated Switchgear business is under investigation by the CADE for alleged anticompetitive practices. In addition, the CADE has opened an investigation into certain other power businesses of the Company, including flexible alternating current transmission systems (FACTS) and power transformers. With respect to these matters, management is cooperating fully with the authorities. An informed judgment about the outcome of these investigations or the amount of potential loss or range of loss for the Company, if any, relating to these investigations cannot be made at this stage.

Suspect payments

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. The SFO has commenced an investigation into this matter. The Company is cooperating fully with the authorities. At this time, it is not possible for the Company to make an informed judgment about the outcome of these matters.

General

In addition, 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 various legal proceedings, investigations, and claims that have not yet been resolved. With respect to the above-mentioned regulatory matters and commercial litigation contingencies, the Company will bear the costs of the continuing investigations and any related legal proceedings.

Liabilities recognized

At December 31, 2017 and 2016, the Company had aggregate liabilities of \$233 million and \$150 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 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 material 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.

	<u>December 31,</u>	
	<u>2017</u>	<u>2016</u>
	Maximum potential	
	payments	
(\$ in millions)		
Performance guarantees	1,775	193
Financial guarantees	17	69
Indemnification guarantees	72	71
Total	<u>1,864</u>	<u>333</u>

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, 2017 and 2016, were not significant.

The Company is party to various guarantees providing financial or performance assurances to certain third parties. These guarantees, which have various maturities up to 2027, 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 eight 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, 2017, the maximum potential payable under these guarantees amounts to \$929 million and these guarantees have various maturities ranging from one to ten years.

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, 2017 and 2016, the total outstanding performance bonds aggregated to \$7.7 billion and \$7.9 billion, respectively. There have been no significant amounts reimbursed to financial institutions under these types of arrangements in 2017, 2016 and 2015.

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)	<u>2017</u>	<u>2016</u>	<u>2015</u>
Balance at January 1,	1,142	1,089	1,148
Net change in warranties due to acquisitions and divestments	30	—	—
Claims paid in cash or in kind	(335)	(329)	(357)
Net increase in provision for changes in estimates, warranties issued and warranties expired	297	424	377
Exchange rate differences	97	(42)	(79)
Balance at December 31,	<u>1,231</u>	<u>1,142</u>	<u>1,089</u>

During 2016, the Company determined that the provision for product warranties in its solar business, acquired in 2013 as part of the purchase of Power-One, was no longer sufficient to cover expected warranty costs in the remaining warranty period. Due to higher than originally expected product failure rates for certain solar inverters designed and manufactured by Power-One, a substantial portion of which relates to products which were delivered to customers prior to the acquisition date, the previously estimated product warranty provision was increased by a total of \$23 million and \$151 million, during 2017 and 2016, respectively. The corresponding increases were included in "Cost of sales of products" and resulted in a decrease in diluted earnings per share of \$0.01 for 2017, and a decrease in basic and diluted earnings per share of \$0.06 and \$0.05, respectively, for 2016. As \$8 million and \$131 million, in 2017 and 2016, respectively, relates to products which were sold prior to the acquisition date these costs have been excluded from the Company's measure of segment profit, Operational EBITA (see Note 23). This warranty provision has been recorded based on the information presently 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—Taxes

“Provision for taxes” consisted of the following:

(\$ in millions)	2017	2016	2015
Current taxes	1,061	925	1,005
Deferred taxes	(201)	(144)	(217)
Tax expense from continuing operations	860	781	788
Tax expense (benefit) from discontinued operations	(4)	(4)	(2)

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, corporate income tax in foreign jurisdictions largely determines the weighted-average global tax rate of the Company.

On December 22, 2017, the U.S. Government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the Tax Act). The Tax Act makes broad and complex changes to the U.S. tax code. The SEC staff issued Staff Accounting Bulletin No. 118, which has allowed the Company to record provisional amounts in income tax expense from continuing operations in the 2017 financial statements. The estimated impact includes a benefit of \$30 million due to changes in tax rates, valuation allowance on foreign tax credits and undistributed earnings of subsidiaries, offset by \$26 million charge for one-time transition tax. Ongoing guidance and accounting interpretations are expected over the next 12 months and the completion of the accounting for the Tax Act will be finalized during that measurement period.

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

(\$ in millions, except % data)	2017	2016	2015
Income from continuing operations before taxes	3,231	2,799	2,840
Weighted-average global tax rate	23.5%	21.2%	21.8%
Income taxes at weighted-average tax rate	760	594	619
Items taxed at rates other than the weighted-average tax rate	(102)	27	(36)
Changes in valuation allowance, net	753	(17)	57
Effects of changes in tax laws and (enacted) tax rates	(747)	42	—
Non-deductible expenses, excluding goodwill	58	86	52
Other, net	138	49	96
Tax expense from continuing operations	860	781	788
Effective tax rate for the year	26.6%	27.9%	27.7%

In 2017, the benefit reported in “Items taxed at rates other than the weighted-average tax rate” predominantly included a positive impact of \$72 million related to non-taxable amounts for net gains from sale of businesses. In 2015, the benefit reported in “Items taxed at rates other than the weighted-average tax rate” predominantly included a benefit of \$50 million related to tax credits arising from research and development activities.

In 2017, the relevant tax rate applicable to one of the Company’s subsidiaries increased and in connection with this change, the company benefited from an increase of \$721 million in deferred tax assets relating to certain long-term assets. The respective effect is reported in “Effects of changes in tax laws and (enacted) tax rates”. After evaluating the recoverability of this deferred tax asset, the Company recorded a valuation allowance of \$668 million as the Company determined that it was more likely than not that such deferred tax assets would not be realized. This is reported in the table above in “Changes in valuation allowance, net”.

In 2016 and 2015, “Changes in valuation allowance, net” included reductions in valuation allowances recorded in certain jurisdictions where the Company determined that it was more likely than not that such deferred tax assets (recognized for net operating losses and temporary differences in those jurisdictions) would be realized, as well as increases in the valuation allowance in certain other jurisdictions. In 2015, the “Changes in valuation allowance, net” included an expense of \$21 million related to certain of the Company’s operations in Asia.

In 2017, 2016 and 2015, “Non-deductible expenses” of \$58 million, \$86 million and \$52 million, respectively, included expenses in relation to items that were deducted for financial accounting purposes, but were not tax deductible, such as interest expense, local taxes on productive activities, disallowed meals and entertainment expenses and other similar items.

In 2017, 2016 and 2015, “Other, net” in the table above included net charges of \$148 million, \$50 million and \$74 million, respectively, related to the interpretation of tax law and double tax treaty agreements by competent tax authorities.

Deferred income tax assets and liabilities consisted of the following:

(\$ in millions)	December 31,	
	2017	2016
<i>Deferred tax assets:</i>		
Unused tax losses and credits	524	514
Provisions and other accrued liabilities	779	865
Pension	473	507
Inventories	275	273
Property, plant and equipment and other non-current assets	1,152	266
Other	98	93
Total gross deferred tax asset	3,301	2,518
Valuation allowance	(1,323)	(561)
Total gross deferred tax asset, net of valuation allowance	1,978	1,957
<i>Deferred tax liabilities:</i>		
Property, plant and equipment	(237)	(234)
Intangibles and other assets	(739)	(724)
Pension and other liabilities	(220)	(171)
Inventories	(74)	(91)
Unremitted earnings	(557)	(537)
Total gross deferred tax liability	(1,827)	(1,757)
Net deferred tax asset (liability)	151	200
<i>Included in:⁽¹⁾</i>		
“Deferred taxes”—non-current assets	1,250	1,118
“Deferred taxes”—non-current liabilities	(1,099)	(918)
Net deferred tax asset (liability)	151	200

(1) As a result of the adoption of an accounting standard update on the classification of deferred taxes (see Note 2), the information presented for 2016 has been reclassified.

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 and amount to \$1,323 million and \$561 million, at December 31, 2017 and 2016, respectively. “Unused tax losses and credits” at December 31, 2017 and 2016, in the table above, included \$155 million and \$108 million, respectively, for which the Company has established a full 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.

At December 31, 2017 and 2016, deferred tax liabilities totaling \$557 million and \$537 million, respectively, have been provided for primarily in respect of withholding taxes, dividend distribution taxes or additional corporate income taxes (hereafter “withholding taxes”) on unremitted earnings which will be payable in foreign jurisdictions on the repatriation of 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. 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. Such taxes cannot always be fully reclaimed by the shareholder, although they have to be declared and withheld by the subsidiary. In 2017 and 2016, certain taxes arose in certain foreign jurisdictions for which the technical merits do not allow utilization of benefits. At both December 31, 2017 and 2016, foreign subsidiary retained earnings subject to withholding taxes upon distribution of approximately \$100 million were considered as permanently 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, 2017, net operating loss carry-forwards of \$1,708 million and tax credits of \$133 million were available to reduce future taxes of certain subsidiaries. Of these amounts, \$974 million of loss carry-forwards and \$107 million of tax credits will expire in varying amounts through 2037. 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, 2015	705	146	851
Increase relating to prior year tax positions	52	38	90
Decrease relating to prior year tax positions	(33)	(3)	(36)
Increase relating to current year tax positions	155	—	155
Decrease due to settlements with tax authorities	(38)	(13)	(51)
Decrease as a result of the applicable statute of limitations	(62)	(15)	(77)
Exchange rate differences	(35)	(8)	(43)
Balance at December 31, 2015, which would, if recognized, affect the effective tax rate	744	145	889
Increase relating to prior year tax positions	88	74	162
Decrease relating to prior year tax positions	(21)	(20)	(41)
Increase relating to current year tax positions	167	13	180
Decrease due to settlements with tax authorities	(96)	(21)	(117)
Decrease as a result of the applicable statute of limitations	(95)	(13)	(108)
Exchange rate differences	(27)	(6)	(33)
Balance at December 31, 2016, which would, if recognized, affect the effective tax rate	760	172	932
Increase relating to prior year tax positions	115	103	218
Decrease relating to prior year tax positions	(76)	(37)	(113)
Increase relating to current year tax positions	223	—	223
Decrease due to settlements with tax authorities	(23)	(2)	(25)
Decrease as a result of the applicable statute of limitations	(75)	(12)	(87)
Exchange rate differences	101	18	119
Balance at December 31, 2017, which would, if recognized, affect the effective tax rate	1,025	242	1,267

In 2017, 2016 and 2015, the “Increase relating to current year tax positions” included a total of \$193 million, \$132 million and \$127 million, respectively, in taxes related to the interpretation of tax law and double tax treaty agreements by competent tax authorities.

At December 31, 2017, the Company expected the resolution, within the next twelve months, of uncertain tax positions related to pending court cases amounting to \$32 million for 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, 2017, the earliest significant open tax years that remained subject to examination were the following:

Region	Year
Europe	2011
The Americas	2014
Asia, Middle East and Africa	2008

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. 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 the local government and tax requirements.

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

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:

	2017	2016	2017	2016
	Defined pension benefits		Other postretirement benefits	
(\$ in millions)				
Benefit obligations at January 1,	10,896	11,224	147	178
Service cost	228	249	1	1
Interest cost	249	280	5	6
Contributions by plan participants	82	74	—	—
Benefit payments	(590)	(596)	(11)	(11)
Benefit obligations of businesses acquired (divested)	64	(26)	—	—
Actuarial (gain) loss	228	375	(11)	(17)
Plan amendments and other	(22)	(76)	(1)	(10)
Exchange rate differences	812	(608)	2	—
Benefit obligation at December 31,	11,947	10,896	132	147
Fair value of plan assets at January 1,	9,493	9,743	—	—
Actual return on plan assets	644	659	—	—
Contributions by employer	229	270	11	11
Contributions by plan participants	82	74	—	—
Benefit payments	(590)	(596)	(11)	(11)
Plan assets of businesses acquired (divested)	52	—	—	—
Plan amendments and other	(50)	(133)	—	—
Exchange rate differences	674	(524)	—	—
Fair value of plan assets at December 31,	10,534	9,493	—	—
Funded status — underfunded	(1,413)	(1,403)	(132)	(147)

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

(\$ in millions)	December 31,					
	2017	2016	2015	2017	2016	2015
	Defined pension benefits			Other postretirement benefits		
Net actuarial (loss) gain	(2,321)	(2,237)	(2,383)	20	10	(8)
Prior service credit	99	108	127	27	31	33
Amount recognized in OCI⁽¹⁾ and NCI⁽²⁾	(2,222)	(2,129)	(2,256)	47	41	25
Taxes associated with amount recognized in OCI and NCI	503	487	512	—	—	—
Amount recognized in OCI and NCI, net of tax⁽³⁾	(1,719)	(1,642)	(1,744)	47	41	25

(1) OCI represents "Accumulated other comprehensive loss".

(2) NCI represents "Noncontrolling interests".

(3) NCI, net of tax, amounted to \$0 million at December 31, 2017, 2016 and 2015.

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

(\$ in millions)	December 31,			
	2017	2016	2017	2016
	Defined pension benefits		Other postretirement benefits	
Overfunded plans	122	68	—	—
Underfunded plans — current	(18)	(16)	(12)	(13)
Underfunded plans — non-current	(1,517)	(1,455)	(120)	(134)
Funded status - underfunded	(1,413)	(1,403)	(132)	(147)

(\$ in millions)	December 31,	
	2017	2016
Non-current assets		
Overfunded pension plans	122	68
Other employee-related benefits	22	22
Prepaid pension and other employee benefits	144	90

(\$ in millions)	December 31,	
	2017	2016
Current liabilities		
Underfunded pension plans	(18)	(16)
Underfunded other postretirement benefit plans	(12)	(13)
Other employee-related benefits	(17)	(30)
Pension and other employee benefits (see Note 13)	(47)	(59)

(\$ in millions)	December 31,	
	2017	2016
Non-current liabilities		
Underfunded pension plans	(1,517)	(1,455)
Underfunded other postretirement benefit plans	(120)	(134)
Other employee-related benefits	(245)	(245)
Pension and other employee benefits	(1,882)	(1,834)

The funded status, calculated using the projected benefit obligation (PBO) and fair value of plan assets, for pension plans with a PBO in excess of fair value of plan assets (underfunded) or fair value of plan assets in excess of PBO (overfunded), respectively, was:

(\$ in millions)	December 31,					
	2017			2016		
	PBO	Assets	Difference	PBO	Assets	Difference
PBO exceeds assets	11,034	9,499	(1,535)	9,892	8,420	(1,472)
Assets exceed PBO	913	1,035	122	1,004	1,073	69
Total	11,947	10,534	(1,413)	10,896	9,493	(1,403)

The accumulated benefit obligation (ABO) for all defined benefit pension plans was \$11,683 million and \$10,612 million at December 31, 2017 and 2016, respectively. The funded status, calculated using the ABO and fair value of plan assets for pension plans with ABO in excess of fair value of plan assets (underfunded) or fair value of plan assets in excess of ABO (overfunded), respectively, was:

(\$ in millions)	December 31,					
	2017			2016		
	ABO	Assets	Difference	ABO	Assets	Difference
ABO exceeds assets	9,421	7,914	(1,507)	9,612	8,406	(1,206)
Assets exceed ABO	2,262	2,620	358	1,000	1,087	87
Total	11,683	10,534	(1,149)	10,612	9,493	(1,119)

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)	2017	2016	2015	2017	2016	2015
	Defined pension benefits			Other postretirement benefits		
Service cost	228	249	267	1	1	1
Interest cost	249	280	305	5	6	8
Expected return on plan assets	(407)	(402)	(456)	—	—	—
Amortization of prior service cost (credit)	11	40	38	(5)	(12)	(9)
Amortization of net actuarial loss	91	85	112	(1)	—	1
Curtailments, settlements and special termination benefits	16	41	20	(1)	—	—
Net periodic benefit cost	188	293	286	(1)	(5)	1

The net actuarial loss and prior service cost for defined pension benefits estimated to be amortized from “Accumulated other comprehensive loss” into net periodic benefit cost in 2018 is \$95 million and \$(13) million, respectively.

The net actuarial loss and net prior service credit for other postretirement benefits estimated to be amortized from “Accumulated other comprehensive loss” into net periodic benefit cost in 2018 is \$(1) million and \$(5) million, respectively.

Assumptions

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

(in %)	December 31,			
	2017	2016	2017	2016
	Defined pension benefits		Other postretirement benefits	
Discount rate	2.0	2.3	3.2	3.3
Rate of compensation increase	1.6	1.7	—	—
Rate of pension increase	1.0	1.0	—	—

The discount rate assumptions are based upon AA-rated corporate bonds. In those countries with sufficient liquidity in corporate bonds, the Company used the current market long-term corporate bond yields and matched the bond duration with the average duration of the pension liabilities. In those countries where the liquidity of the AA-rated corporate bonds was deemed to be insufficient, the Company determined the discount rate by adding the credit spread derived from an AA corporate bond index in another relevant liquid market, as adjusted for interest rate differentials, to the domestic government bond curve or interest rate swap curve.

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

(in %)	2017	2016	2015	2017	2016	2015
	Defined pension benefits			Other postretirement benefits		
	Discount rate	2.3	2.6	2.6	3.3	3.6
Expected long-term rate of return on plan assets	4.2	4.3	4.6	—	—	—
Rate of compensation increase	1.7	1.5	1.7	—	—	—

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,	
	2017	2016
Health care cost trend rate assumed for next year	7.1%	7.3%
Rate to which the trend rate is assumed to decline (the ultimate trend rate)	5.0%	5.0%
Year that the rate reaches the ultimate trend rate	2028	2028

A one-percentage-point change in assumed health care cost trend rates would have the following effects at December 31, 2017:

(\$ in millions)	1-percentage-point	
	Increase	Decrease
Effect on postretirement benefit obligation	7	(6)

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 board 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
Asset class	
Equity	21
Fixed income	59
Real estate	12
Other	8
	100

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

Equity assets 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 direct 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, 2017, is 4.1 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.

The Company does not expect any plan assets to be returned to the employer during 2018.

At December 31, 2017 and 2016, plan assets include ABB Ltd's shares (as well as an insignificant amount of the Company's debt instruments) with a total value of \$11 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.

(\$ in millions)	December 31, 2017			Total fair value
	Level 1	Level 2	Level 3	
Asset class				
Equity				
Equity securities	274	—	—	274
Mutual funds/commingled funds	—	1,772	—	1,772
Emerging market mutual funds/commingled funds	—	507	—	507
Fixed income				
Government and corporate securities	564	1,092	—	1,656
Government and corporate—mutual funds/commingled funds	—	3,622	—	3,622
Emerging market bonds—mutual funds/commingled funds	—	708	—	708
Real estate	—	9	1,355	1,364
Insurance contracts	—	113	—	113
Cash and short-term investments	162	140	—	302
Private equity	—	—	128	128
Hedge funds	—	—	15	15
Commodities	—	73	—	73
Total	1,000	8,036	1,498	10,534

(\$ in millions)	December 31, 2016			Total fair value
	Level 1	Level 2	Level 3	
Asset class				
Equity				
Equity securities	244	—	—	244
Mutual funds/commingled funds	—	1,610	—	1,610
Emerging market mutual funds/commingled funds	—	337	—	337
Fixed income				
Government and corporate securities	449	909	—	1,358
Government and corporate—mutual funds/commingled funds	—	3,446	—	3,446
Emerging market bonds—mutual funds/commingled funds	—	692	—	692
Real estate	—	33	1,116	1,149
Insurance contracts	—	99	—	99
Cash and short-term investments	260	104	—	364
Private equity	—	—	114	114
Hedge funds	—	—	13	13
Commodities	—	67	—	67
Total	953	7,297	1,243	9,493

The following table represents the movements of those asset categories whose fair values use significant unobservable inputs (Level 3):

(\$ in millions)	Private equity	Hedge funds	Real estate	Total Level 3
Balance at January 1, 2016	123	94	1,106	1,323
Return on plan assets				
Assets still held at December 31, 2016	(9)	—	82	73
Assets sold during the year	15	(4)	—	11
Purchases (sales)	(13)	(77)	(1)	(91)
Transfers from Level 3	1	—	(3)	(2)
Exchange rate differences	(3)	—	(68)	(71)
Balance at December 31, 2016	114	13	1,116	1,243
Return on plan assets				
Assets still held at December 31, 2017	4	—	27	31
Assets sold during the year	10	—	5	15
Purchases (sales)	(6)	2	142	138
Exchange rate differences	6	—	65	71
Balance at December 31, 2017	128	15	1,355	1,498

Real estate properties, which are primarily located in Switzerland, are valued under the income approach using the discounted cash flow method, by which the market value of a property is determined as the total of all projected future earnings discounted to the valuation date. The discount rates are determined for each property individually according to the property's location and specific use, and by considering initial yields of comparable market transactions.

Private equity investments include investments in partnerships and related funds. Such investments consist of publicly traded and privately held securities. Publicly traded securities that are quoted in inactive markets are valued using available quotes and adjusted for liquidity restrictions. Privately held securities are valued taking into account various factors, such as the most recent financing involving unrelated new investors, earnings multiple analyses using comparable companies and discounted cash flow analyses.

Hedge funds are not normally exchange-traded and the shares of the funds cannot be redeemed daily. Depending on the fund structure, the fair values are derived through modeling techniques based on the values of the underlying assets adjusted to reflect liquidity and transferability restrictions.

Contributions

Employer contributions were as follows:

(\$ in millions)	2017	2016	2017	2016
	Defined pension benefits		Other postretirement benefits	
Total contributions to defined benefit pension and other postretirement benefit plans	229	270	11	11
Of which, discretionary contributions to defined benefit pension plans	15	15	—	—

In 2017, 2016 and 2015, total contributions included non-cash contributions totaling \$31 million, \$52 million and \$22 million, respectively, of available-for-sale debt securities to certain of the Company's pension plans.

The Company expects to contribute approximately \$212 million, including \$15 million in discretionary contributions, to its defined benefit pension plans in 2018. These discretionary contributions are expected to be non-cash contributions. The Company expects to contribute approximately \$12 million to its other postretirement benefit plans in 2018.

The Company also contributes to a number of defined contribution plans. The aggregate expense for these plans was \$233 million, \$210 million and \$218 million in 2017, 2016 and 2015, respectively. Contributions to multi-employer plans were not significant in 2017, 2016 and 2015.

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, 2017, are as follows:

(\$ in millions)	Defined pension benefits	Other postretirement benefits
2018	682	12
2019	632	12
2020	632	11
2021	613	11
2022	611	11
Years 2023 - 2027	2,948	46

Note 18—Share-based payment arrangements

The Company has 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 \$58 million, \$54 million and \$61 million in 2017, 2016 and 2015, respectively. Compensation cost for cash-settled awards is recorded in "Selling, general and administrative expenses" and is disclosed in the "WARs", "LTIP" and "Other share-based payments" sections of this note. The total tax benefit recognized in 2017, 2016 and 2015 was not significant.

At December 31, 2017, 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, 30 million shares held by the Company as treasury stock at December 31, 2017, 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.

MIP

Under the MIP, the Company offers options and cash-settled WARs to key employees for no consideration.

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 instruments 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 instruments 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. Vesting restrictions can be waived in certain circumstances such as death or disability. All options and WARs expire six years from the date of grant.

Options

The fair value of each option is estimated on the date of grant using a lattice model that uses the assumptions noted in the table below. Expected volatilities are based on implied volatilities from equivalent listed warrants on ABB Ltd shares. The expected term of the options granted is the contractual six-year life of each option, based on the fact that after the vesting period, a participant can elect to sell the option rather than exercise the right to purchase shares, thereby also realizing the time value of the options. The risk-free rate is based on a six-year Swiss franc interest rate, reflecting the six-year contractual life of the options. In estimating forfeitures, the Company has used the data from previous comparable MIP launches.

	<u>2017</u>	<u>2016</u>	<u>2015</u>
Expected volatility	19%	19%	17%
Dividend yield	4.7%	4.9%	3.2%
Expected term	6 years	6 years	6 years
Risk-free interest rate	-0.1%	-0.5%	-0.3%

Presented below is a summary of the activity related to options under the MIP:

	Number of instruments (in millions)	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) ⁽³⁾
Outstanding at January 1, 2017	391.4	78.3	20.98		
Granted	71.9	14.4	22.50		
Exercised ⁽⁴⁾	(26.5)	(5.3)	16.55		
Forfeited	(3.3)	(0.7)	21.03		
Expired	(42.9)	(8.6)	25.50		
Outstanding at December 31, 2017	390.6	78.1	21.06	3.5	395
Vested and expected to vest at December 31, 2017	383.7	76.7	21.04	3.4	390
Exercisable at December 31, 2017	188.9	37.8	20.88	2.2	198

(1) Information presented reflects the number of shares of ABB Ltd that can be received upon exercise, as warrants and options have a conversion ratio of 5:1.

(2) Information presented reflects the exercise price per share of ABB Ltd.

(3) Computed using the closing price, in Swiss francs, of ABB Ltd shares on the SIX Swiss Exchange and the exercise price per share of ABB Ltd.

(4) The cash received upon exercise amounted to approximately \$88 million. The shares were delivered out of treasury stock.

At December 31, 2017, there was \$51 million of total unrecognized compensation cost related to non-vested options granted under the MIP. That cost is expected to be recognized over a weighted-average period of 2.1 years. The weighted-average grant-date fair value (per instrument) of options granted during 2017, 2016 and 2015 was 0.47 Swiss francs, 0.47 Swiss francs and 0.39 Swiss francs, respectively. In 2017, 2016 and 2015 the aggregate intrinsic value (on the date of exercise) of instruments exercised was \$38 million, \$27 million and \$10 million, respectively.

Presented below is a summary, by launch, related to instruments outstanding at December 31, 2017:

	Number of instruments	Number of shares	Weighted- average remaining contractual term (in years)
Exercise price (in Swiss francs) ⁽¹⁾	(in millions)	(in millions) ⁽²⁾	
15.75	6.7	1.3	0.4
17.50	2.6	0.5	0.4
21.50	81.2	16.2	1.4
21.00	72.6	14.5	2.7
19.50	79.3	15.9	3.6
21.50	76.6	15.4	4.7
22.50	71.6	14.3	5.6
Total number of instruments and shares	390.6	78.1	3.5

(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 recorded an expense of \$22 million and \$14 million in 2017 and 2016, as a result of changes in both the fair value and vested portion of the outstanding WARs. The amount recorded in 2015 was not significant. 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 5), with subsequent changes in fair value recorded in earnings to the extent that they offset the change in fair value of the liability for the WARs. In 2017 the Company recorded an income of \$18 million in “Selling, general and administrative expenses” related to the cash-settled call options. The amounts recorded in 2016 and 2015 were not significant.

The aggregate fair value of outstanding WARs was \$42 million and \$23 million at December 31, 2017 and 2016, respectively. The fair value of WARs was determined based upon the trading price of equivalent warrants listed on the SIX Swiss Exchange.

Presented below is a summary of the activity related to WARs:

	Number of WARs (in millions)
Outstanding at January 1, 2017	47.3
Granted	8.5
Exercised	(15.3)
Forfeited	(0.5)
Expired	(2.9)
Outstanding at December 31, 2017	37.1
Exercisable at December 31, 2017	10.8

The aggregate fair value at date of grant of WARs granted in 2017, 2016 and 2015 was not significant. In 2017, 2016 and 2015, share-based liabilities of \$10 million, \$7 million and \$9 million, respectively, were paid upon exercise of WARs by participants.

ESAP

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 Depository 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.

	2017	2016	2015
Expected volatility	17%	20%	20%
Dividend yield	3.1%	3.7%	3.9%
Expected term	1 year	1 year	1 year
Risk-free interest rate	-0.6%	-0.7%	-0.8%

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, 2017	3.4	20.12		
Granted	2.9	26.26		
Forfeited	(0.2)	20.16		
Exercised ⁽⁴⁾	(2.8)	20.12		
Not exercised (savings returned plus interest)	(0.4)	20.12		
Outstanding at December 31, 2017	2.9	26.26	0.8	—
Vested and expected to vest at December 31, 2017	2.7	26.26	0.8	—
Exercisable at December 31, 2017	—	—	—	—

(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 upon exercise was approximately \$60 million. The shares were delivered out of treasury stock.

The exercise prices per ABB Ltd share and per ADS of 26.26 Swiss francs and \$26.24, respectively, for the 2017 grant, 20.12 Swiss francs and \$20.52, respectively, for the 2016 grant, and 18.78 Swiss francs and \$19.10, respectively, for the 2015 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.

At December 31, 2017, 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 2017, 2016 and 2015 was 1.37 Swiss francs, 1.24 Swiss francs and 1.07 Swiss francs, respectively. The total intrinsic value (on the date of exercise) of options exercised in 2017 was \$17 million while in 2016 and 2015 it was not significant.

LTIP

The Company has a long-term incentive plan (LTIP) for members of its Executive Committee and selected other senior executives (Eligible Participants), as defined in the terms of the LTIP. The LTIP involves annual conditional grants of the Company's stock to such Eligible Participants that are subject to certain conditions.

The 2017 LTIP launch is composed of two performance components: (i) a component which is based on the average percentage achievement of income from continuing operations, net of tax, versus budget and (ii) a component which is based on the Company's earnings per share performance. The 2016 and 2015 LTIP launches are each composed of two performance components: (i) a component which is based on the achievement of a net income threshold and (ii) a component which is based on the Company's earnings per share performance.

For the average percentage achievement of income versus budget component of the 2017 LTIP launch, the actual number of shares that will vest at a future date is dependent on the average percentage (of each year in a three year period starting with the year of grant) of the Company's income from continuing operations, net of tax, divided by the Company's budgeted income from operations, net of tax. The actual number of shares that ultimately vest will vary depending on the average percentage that is achieved between a lower threshold (no shares vest) and an upper threshold (the number of shares vesting is capped at 150 percent of the conditional grant). For shares to vest under the threshold net income component of the 2016 and 2015 LTIP launches, the Company's net income has to reach a certain level set by the Board of Directors at the launch of the LTIP. The shares will not vest if this threshold is not achieved and will vest at 100 percent if this threshold is equaled or exceeded. In addition, the Eligible Participant has to fulfill the service condition as defined in the terms and conditions of the LTIP.

For the earnings per share performance component of the 2017, 2016 and 2015 LTIP launches, the actual number of shares that will vest at a future date is dependent on (i) the Company's weighted cumulative earnings per share performance over three financial years, beginning with the year of launch, and (ii) the fulfillment of the service condition as defined in the terms and conditions of the LTIP. The cumulative earnings per share performance is weighted as follows: 33 percent of the first year's result, 67 percent of the second year's result and 100 percent of the third year's result. The actual number of shares that ultimately vest will vary depending on the weighted cumulative earnings per share outcome, interpolated between a lower threshold (no shares vest) and an upper threshold (the number of shares vesting is capped at 200 percent of the conditional grant).

Under each component of the 2017, 2016 and 2015 LTIP launches, an Eligible Participant receives 70 percent of the shares that have vested in the form of shares and 30 percent of the value of the shares that have vested in cash, with the possibility to elect to also receive the 30 percent portion in shares rather than in cash.

Presented below is a summary of activity under the LTIP:

	Number of Shares Conditionally Granted			Weighted- average grant-date fair value per share (Swiss francs)		
	Equity & Cash or choice of 100% Equity Settlement ⁽¹⁾ (in millions)	Only Cash Settlement ⁽²⁾ (in millions)	Total (in millions)			
	Nonvested at January 1, 2017	2.6	0.3		2.9	20.89
	Granted	0.9	—		0.9	22.13
Vested	(0.9)	(0.1)	(1.0)	20.66		
Forfeited	(0.1)	(0.2)	(0.3)	20.49		
Nonvested at December 31, 2017	2.5	—	2.5	21.45		

(1) Shares that, subject to vesting, the Eligible Participant can elect to receive 100 percent in the form of shares.

(2) Shares that, subject to vesting, the Eligible Participant can only receive in cash.

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, 2017, there was \$21 million of total unrecognized compensation cost related to equity-settled awards under the LTIP. That cost is expected to be recognized over a weighted-average period of 2 years. The compensation cost recorded in 2017, 2016 and 2015 for cash-settled awards was not significant.

The aggregate fair value, at the dates of grant, of shares granted in 2017, 2016 and 2015 was \$22 million, \$22 million and \$23 million, respectively. The total grant-date fair value of shares that vested during 2017, 2016 and 2015 was \$22 million, \$15 million and \$12 million, respectively. The weighted-average grant-date fair value (per share) of shares granted during 2017, 2016 and 2015 was 22.13 Swiss francs, 20.77 Swiss francs and 21.54 Swiss francs, respectively.

For the average percentage achievement of income versus budget component of the 2017 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 average percentage achievement of income versus budget that would result in the vesting of the highest number of shares, 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 net income threshold component of the 2016 and 2015 LTIP launches, the fair value of the granted shares is based on the probability of reaching the threshold as well as 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. 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 that would result in the vesting of the highest number of shares, 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.

Other share-based payments

The Company has other minor share-based payment arrangements with certain employees. The compensation cost related to these arrangements in 2017, 2016 and 2015 was not significant.

Note 19—Stockholders’ equity

At December 31, 2017 and 2016, the Company had 2,672 million and 2,719 million authorized shares, respectively, of which 2,168 million and 2,215 million, respectively, were registered and issued.

At the Annual General Meeting of Shareholders (AGM) in April 2017, shareholders approved the proposal of the Board of Directors to distribute a total of 0.76 Swiss francs per share. The approved dividend distribution amounted to \$1,622 million and was paid in April 2017. At the AGM in April 2016, shareholders approved the proposal of the Board of Directors to distribute a total of 0.74 Swiss francs per share to shareholders by way of a nominal value reduction (reduction in the par value of each share) from 0.86 Swiss francs to 0.12 Swiss francs. In July 2016, the nominal value reduction was registered in the commercial register of the canton of Zurich, Switzerland, and was paid. The Company recorded a reduction in Capital stock and an increase in Additional paid-in capital of \$1,239 million and \$15 million, respectively, and a reduction in Retained earnings of \$402 million in relation to the nominal value reduction. At the AGM in April 2015, shareholders approved the proposals of the Board of Directors to distribute a total of 0.72 Swiss francs per share to shareholders, comprising of a dividend of 0.55 Swiss francs paid out of ABB Ltd’s capital contribution reserves and a distribution of 0.17 Swiss francs by way of a nominal value reduction from 1.03 Swiss francs to 0.86 Swiss francs. The approved dividend distribution amounted to \$1,317 million and was paid in May 2015. The nominal value reduction was registered in July 2015 in the commercial register of the canton of Zurich, Switzerland, and was paid. The approved nominal value reduction was recorded as reductions to Capital stock and Additional paid-in capital of \$285 million and \$64 million, respectively, and a reduction in Retained earnings of \$54 million.

Between September 2014 and September 2016, the Company executed a share buyback program for the purchase of up to \$4 billion of its own shares and on September 30, 2016, announced that it had completed this program. Over the period of the share buyback, the Company purchased a total of 146.6 million shares (for approximately \$3 billion) for cancellation and 24.7 million shares (for approximately \$0.5 billion) to support its employee share programs. The shares acquired for cancellation were purchased through a separate trading line on the SIX Swiss Exchange (on which only the Company could purchase shares), while shares acquired for delivery under employee share programs were acquired through the ordinary trading line. In 2016, under the announced share buyback program, the Company purchased 60.4 million shares for cancellation and 4.9 million shares to support its employee share programs. These transactions resulted in an increase in Treasury stock of \$1,280 million. In 2015, under the program, the Company purchased 60.2 million shares for cancellation and 13.1 million shares to support its employee share programs. These transactions resulted in an increase in Treasury stock of \$1,501 million.

In the second quarter of 2017, the Company purchased on the open market an aggregate of 10 million of its own shares to be available for delivery under its employee share programs. These transactions resulted in an increase in Treasury stock of \$251 million.

At the AGM in April 2017, shareholders approved the proposal of the Board of Directors to reduce the share capital of the Company by cancelling 46,595,000 treasury shares which were acquired under the \$4 billion share buyback program. This cancellation was completed in July 2017, resulting in a decrease in Treasury stock of \$953 million and a corresponding combined decrease in Capital stock, Additional paid-in capital and Retained earnings. At the AGM in April 2016, shareholders approved the proposal of the Board of Directors to reduce the share capital of the Company by cancelling 100,000,000 treasury shares which were acquired under the \$4 billion share buyback program. This cancellation was completed in July 2016, resulting in a decrease in Treasury stock of \$2,047 million and a corresponding combined decrease in Capital stock, Additional paid-in capital and Retained earnings.

Upon and in connection with each launch of the Company's MIP, the Company sold call options to a bank at fair value, giving the bank the right to acquire shares equivalent to the number of shares represented by the MIP WAR awards to participants. Under the terms of the agreement with the bank, the call options can only be exercised by the bank to the extent that MIP participants have exercised their WARs. At December 31, 2017, such call options representing 11.6 million shares and with strike prices ranging from 15.75 to 22.50 Swiss francs (weighted-average strike price of 21.02 Swiss francs) were held by the bank. The call options expire in periods ranging from May 2018 to August 2023. However, only 4.2 million of these instruments, with strike prices ranging from 15.75 to 21.50 Swiss francs (weighted-average strike price of 21.25 Swiss francs), could be exercised at December 31, 2017, under the terms of the agreement with the bank.

In addition to the above, at December 31, 2017, the Company had further outstanding obligations to deliver:

- up to 1.8 million shares relating to the options granted under the 2012 launches of the MIP, with a weighted-average strike price of 16.24 Swiss francs, vested in May 2015 and expiring in May 2018,
- up to 16.2 million shares relating to the options granted under the 2013 launch of the MIP, with a strike price of 21.50 Swiss francs, vested in May 2016 and expiring in May 2019,
- up to 14.5 million shares relating to the options granted under the 2014 launch of the MIP, with a strike price of 21.00 Swiss francs, vested in August 2017 and expiring in August 2020,
- up to 15.9 million shares relating to the options granted under the 2015 launch of the MIP, with a strike price of 19.50 Swiss francs, vesting in August 2018 and expiring in August 2021,
- up to 15.4 million shares relating to the options granted under the 2016 launch of the MIP, with a strike price of 21.50 Swiss francs, vesting in August 2019 and expiring in August 2022,
- up to 14.3 million shares relating to the options granted under the 2017 launch of the MIP, with a strike price of 22.50 Swiss francs, vesting in August 2020 and expiring in August 2023,
- up to 3 million shares relating to the ESAP, vesting and expiring in October 2018,
- up to 4 million shares to Eligible Participants under the 2017, 2016 and 2015 launches of the LTIP, vesting and expiring in June 2020, June 2019 and June 2018, respectively, and

- less than 1 million shares in connection with certain other share-based payment arrangements with employees.

See Note 18 for a description of the above share-based payment arrangements.

In 2017, 2016 and 2015, the Company delivered 6.3 million, 8.9 million and 5.3 million shares, respectively, out of treasury stock, for options exercised in relation to the MIP. In addition, in 2017 and 2016 the Company delivered 2.8 million and 2.6 million shares from treasury stock under the ESAP. In 2015 the number of shares delivered under the ESAP was not significant.

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, 2017, the total unconsolidated stockholders' equity of ABB Ltd was 8,654 million Swiss francs (\$8,855 million), including 260 million Swiss francs (\$266 million) representing share capital, 9,029 million Swiss francs (\$9,239 million) representing reserves and 635 million Swiss francs (\$650 million) representing a reduction of equity for own shares (treasury stock). Of the reserves, 635 million Swiss francs (\$650 million) relating to own shares and 52 million Swiss francs (\$53 million) representing 20 percent of share capital, are restricted and not available for distribution.

In February 2018, the Company announced that a proposal will be put to the 2018 AGM for approval by the shareholders to distribute 0.78 Swiss francs per share to shareholders.

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 2017, 2016 and 2015, outstanding securities representing a maximum of 31 million, 87 million and 78 million shares, respectively, were excluded from the calculation of diluted earnings per share as their inclusion would have been anti-dilutive.

Basic earnings per share:

(\$ in millions, except per share data in \$)	2017	2016	2015
<i>Amounts attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	2,219	1,883	1,930
Income (loss) from discontinued operations, net of tax	(6)	16	3
Net income	2,213	1,899	1,933
Weighted-average number of shares outstanding (in millions)	2,138	2,151	2,226
<i>Basic earnings per share attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	1.04	0.88	0.87
Income (loss) from discontinued operations, net of tax	—	—	—
Net income	1.04	0.88	0.87

Diluted earnings per share:

(\$ in millions, except per share data in \$)	2017	2016	2015
<i>Amounts attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	2,219	1,883	1,930
Income (loss) from discontinued operations, net of tax	(6)	16	3
Net income	2,213	1,899	1,933
Weighted-average number of shares outstanding (in millions)	2,138	2,151	2,226
<i>Effect of dilutive securities:</i>			
Call options and shares	10	3	4
Adjusted weighted-average number of shares outstanding (in millions)	2,148	2,154	2,230
<i>Diluted earnings per share attributable to ABB shareholders:</i>			
Income from continuing operations, net of tax	1.03	0.87	0.87
Income (loss) from discontinued operations, net of tax	—	0.01	—
Net income	1.03	0.88	0.87

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)	2017			2016			2015		
	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	911	1	912	(469)	(12)	(481)	(1,105)	47	(1,058)
Changes attributable to divestments ⁽¹⁾	12	—	12	7	—	7	—	—	—
Net change during the year	923	1	924	(462)	(12)	(474)	(1,105)	47	(1,058)
Available-for-sale securities:									
Net unrealized gains (losses) arising during the year	1	—	1	—	—	—	(8)	1	(7)
Reclassification adjustments for net (gains) losses included in net income	—	—	—	—	—	—	1	—	1
Net change during the year	1	—	1	—	—	—	(7)	1	(6)
Pension and other postretirement plans:									
Prior service (costs) credits arising during the year	(20)	4	(16)	(46)	6	(40)	113	(25)	88
Net actuarial gains (losses) arising during the year	(184)	45	(139)	38	6	44	285	(75)	210
Amortization of prior service cost included in net income	6	—	6	28	(2)	26	29	(3)	26
Amortization of net actuarial loss included in net income	90	(27)	63	85	(23)	62	113	(31)	82
Net losses from pension settlements included in net income	13	(4)	9	37	(11)	26	15	(6)	9
Changes attributable to divestments ⁽¹⁾	8	(2)	6	—	—	—	—	—	—
Net change during the year	(87)	16	(71)	142	(24)	118	555	(140)	415
Cash flow hedge derivatives:									
Net gains (losses) arising during the year	45	(7)	38	21	(5)	16	(26)	6	(20)
Reclassification adjustments for net (gains) losses included in net income	(26)	4	(22)	(7)	1	(6)	39	(9)	30
Changes attributable to divestments ⁽¹⁾	(4)	1	(3)	—	—	—	—	—	—
Net change during the year	15	(2)	13	14	(4)	10	13	(3)	10
Total other comprehensive income (loss)	852	15	867	(306)	(40)	(346)	(544)	(95)	(639)

(1) Amounts in 2017 mainly relate to the divestment of the high-voltage cable system and cable accessories businesses and are included in the net gain from sale of businesses (see Note 3).

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 postretirement plan adjustments	Unrealized gains (losses) of cash flow hedge derivatives	Accumulated other comprehensive loss
Balance at January 1, 2015	(2,102)	13	(2,131)	(21)	(4,241)
Other comprehensive (loss) income before reclassifications	(1,058)	(7)	298	(20)	(787)
Amounts reclassified from OCI	—	1	117	30	148
Total other comprehensive (loss) income	(1,058)	(6)	415	10	(639)
<i>Less:</i>					
Amounts attributable to noncontrolling interests	(25)	—	3	—	(22)
Balance at December 31, 2015	(3,135)	7	(1,719)	(11)	(4,858)
Other comprehensive (loss) income before reclassifications	(481)	—	4	16	(461)
Amounts reclassified from OCI	—	—	114	(6)	108
Changes attributable to divestments	7	—	—	—	7
Total other comprehensive (loss) income	(474)	—	118	10	(346)
<i>Less:</i>					
Amounts attributable to noncontrolling interests	(17)	—	—	—	(17)
Balance at December 31, 2016	(3,592)	7	(1,601)	(1)	(5,187)
Other comprehensive (loss) income before reclassifications	912	1	(155)	38	796
Amounts reclassified from OCI	—	—	78	(22)	56
Changes attributable to divestments	12	—	6	(3)	15
Total other comprehensive (loss) income	924	1	(71)	13	867
<i>Less:</i>					
Amounts attributable to noncontrolling interests	25	—	—	—	25
Balance at December 31, 2017	(2,693)	8	(1,672)	12	(4,345)

The following table reflects amounts reclassified out of OCI in respect of Pension and other postretirement plan adjustments:

(\$ in millions)	Location of (gains) losses reclassified from OCI	2017	2016	2015
Details about OCI components				
<i>Pension and other postretirement plan adjustments:</i>				
Amortization of prior service cost	Net periodic benefit cost ⁽¹⁾	6	28	29
Amortization of net actuarial losses	Net periodic benefit cost ⁽¹⁾	90	85	113
Net losses from pension settlements	Net periodic benefit cost ⁽¹⁾	13	37	15
Total before tax		109	150	157
Tax	Provision for taxes	(31)	(36)	(40)
Amounts reclassified from OCI		78	114	117

(1) These components are included in the computation of net periodic benefit cost (see Note 17).

The amounts reclassified out of OCI in respect of Unrealized gains (losses) on available-for-sale securities and Unrealized gains (losses) of cash flow hedge derivatives were not significant in 2017, 2016 and 2015.

Note 22—Restructuring and related expenses

White Collar Productivity program

In September 2015, the Company announced a two-year program aimed at making the Company leaner, faster and more customer-focused. Productivity improvements include the rapid expansion and use of regional shared service centers as well as the streamlining of global operations and head office functions, with business units moving closer to their respective key markets. During this program, the Company implemented and executed various restructuring initiatives across all operating segments and regions. As of December 31, 2017, the Company had incurred substantially all costs related to the White Collar Productivity program.

The following table outlines the cumulative costs incurred and the total amount of costs under the program per operating segment:

(\$ in millions)	Costs incurred in			Cumulative costs
	2017	2016 ⁽¹⁾	2015 ⁽¹⁾	incurred up to December 31, 2017 ⁽¹⁾
Electrification Products	(17)	15	74	72
Robotics and Motion	(14)	26	44	56
Industrial Automation	(22)	36	96	110
Power Grids	(38)	33	70	65
Corporate and Other	(34)	30	86	82
Total	(125)	140	370	385

(1) Total costs have been recast to reflect the reorganization of the Company's operating segments as outlined in Note 23.

The Company recorded the following expenses, net of changes in estimates, under this program:

(\$ in millions)	2017	2016	2015	Cumulative costs
				incurred up to December 31, 2017
Employee severance costs	(129)	130	364	365
Estimated contract settlement, loss order and other costs	3	2	5	10
Inventory and long-lived asset impairments	1	8	1	10
Total	(125)	140	370	385

Expenses, net of changes in estimates, associated with this program are recorded in the following line items in the Consolidated Income Statements:

(\$ in millions)	2017	2016	2015
Total cost of sales	(79)	92	122
Selling, general and administrative expenses	(42)	38	187
Non-order related research and development expenses	(6)	(5)	38
Other income (expense), net	2	15	23
Total	(125)	140	370

Liabilities associated with the White Collar Productivity program are primarily included in “Other provisions”. The following table shows the activity from the beginning of the program to December 31, 2017, by expense type:

(\$ in millions)	Employee severance costs	Contract settlement, loss order and other costs	Total
Liability at January 1, 2015	—	—	—
Expenses	364	5	369
Cash payments	(34)	(1)	(35)
Liability at December 31, 2015	330	4	334
Expenses	232	3	235
Cash payments	(106)	(3)	(109)
Change in estimates	(102)	(1)	(103)
Exchange rate differences	(23)	—	(23)
Liability at December 31, 2016	331	3	334
Expenses	35	3	38
Cash payments	(110)	(5)	(115)
Change in estimates	(164)	—	(164)
Exchange rate differences	28	—	28
Liability at December 31, 2017	120	1	121

The change in estimates during 2016 of \$103 million is due to significantly higher than expected rates of attrition and internal redeployment and a lower than expected severance cost per employee for the employee groups affected by the first phase of restructuring initiated in 2015. The reduction in the liability was recorded in income from operations, primarily as reductions in “Total cost of sales” of \$49 million and in “Selling, general and administrative expenses” of \$38 million.

The change in estimates during 2017 of \$164 million is mainly due to higher than expected rates of attrition and internal redeployment. The reduction in the liability was recorded in income from operations, primarily as reductions in “Total cost of sales” of \$90 million and in “Selling, general and administrative expenses” of \$63 million.

Other restructuring-related activities

In 2017, 2016 and 2015, the Company executed various other restructuring-related activities and incurred charges of \$249 million, \$171 million and \$256 million, respectively.

(\$ in millions)	2017	2016	2015
Employee severance costs	184	90	207
Estimated contract settlement, loss order and other costs	40	40	27
Inventory and long-lived asset impairments	25	41	22
Total	249	171	256

In 2017, 2016 and 2015, \$166 million, \$90 million and \$162 million, respectively, of these expenses were recorded in “Total cost of sales” and \$68 million, \$71 million and \$57 million, respectively, were recorded in “Other income (expense), net”.

At December 31, 2017 and 2016, the balance of other restructuring-related liabilities is primarily included in “Other provisions”.

Change in estimates

In addition to the change in estimate of \$164 million and \$103 million, in 2017 and 2016, respectively, relating to the White Collar Productivity program, a further \$58 million and \$46 million was recorded in 2017 and 2016, respectively, as a change in estimate to reduce liabilities associated with the Company's other restructuring-related activities mainly due to changes in the planned scope of these activities. These were recorded in income from operations, primarily as reductions in "Total cost of sales". The combined total change in estimates during 2017 and 2016 of \$222 million and \$149 million, respectively, resulted in an increase in earnings per share (basic and diluted) of \$0.08 in 2017 and \$0.05 in 2016.

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's operating segments consist of Electrification Products, Robotics and Motion, Industrial Automation and Power Grids. The remaining operations of the Company are included in Corporate and Other.

Effective January 1, 2017, the Company re-allocated the management responsibilities for certain businesses among the four reported operating segments. The primary change was the transfer to the Electrification Products segment of the electric vehicle charging, solar, and power quality businesses from the Discrete Automation and Motion segment. In addition, the Discrete Automation and Motion segment was renamed the Robotics and Motion segment while the Process Automation segment was renamed the Industrial Automation segment.

The segment information for 2016 and 2015, and at December 31, 2016 and 2015, has been recast to reflect these organizational changes. In addition, total assets at December 31, 2016 and 2015, have been adjusted to reflect the additional netting of deferred tax assets and liabilities which resulted from the adoption of an accounting standard update on the classification of deferred taxes.

Furthermore, the results for both the Company's high-voltage cable and cables accessories businesses which, prior to their divestment in March 2017, were included within the Power Grids operating segment, and the Company's Oil & Gas EPC business which, prior to its divestment in December 2017, were included within the Industrial Automation segment, have been reclassified to Corporate and Other for all periods presented.

A description of the types of products and services provided by each reportable segment is as follows:

- *Electrification Products:* manufactures and sells products and services including electric vehicle charging, solar inverters, modular substation packages, switchgear, UPS solutions, circuit breakers, control products, wiring accessories, enclosures and cabling systems, and intelligent home and building solutions designed to integrate and automate the lighting, heating and ventilation, and security and data communication networks.
- *Robotics and Motion:* manufactures and sells robotics, motors, generators, drives, wind converters, components and systems for railways and related services and digital solutions for a wide range of applications in industry, transportation and infrastructure, and utilities.
- *Industrial Automation:* develops and sells integrated automation and electrification systems and solutions, such as process and discrete control solutions, advanced process control software and manufacturing execution systems, sensing, measurement and analytical instrumentation and solutions, electric ship propulsion systems, as well as solutions for modern machine and factory automation and large turbochargers. In addition, the division offers a comprehensive range of services ranging from repair to advanced services such as remote monitoring, preventive maintenance and cybersecurity services.
- *Power Grids:* offers a range of products, systems, service and software solutions across the power value chain of generation, transmission and distribution, to utility, industry, transportation and infrastructure customers. These offerings address existing and evolving grid needs such as the integration of renewables, network control, digital substations, microgrids and asset management. The division portfolio includes turnkey grid integration, transmission systems and substation solutions as well as a wide range of power, distribution and traction transformers, and an array of high-voltage products, such as circuit breakers, switchgear, capacitors.

- *Corporate and Other*: includes headquarters, central research and development, the Company's real estate activities, Group Treasury Operations, historical operating activities of certain divested businesses, and other minor business activities.

The Company evaluates the profitability of its segments based on Operational EBITA, which represents income from operations excluding:

- amortization expense on intangibles arising upon acquisition (acquisition-related amortization),
- restructuring and restructuring-related expenses,
- non-operational pension cost comprising: (a) interest cost, (b) expected return on plan assets, (c) amortization of prior service cost (credit), (d) amortization of net actuarial loss, and (e) curtailments, settlements and special termination benefits,
- changes in the amount recorded for retained obligations of divested businesses occurring after the divestment date (changes in retained obligations of 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,
- acquisition-related expenses and certain 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).

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 segment revenues, Operational EBITA, the reconciliations of consolidated Operational EBITA to income from continuing operations before taxes, as well as depreciation and amortization, and capital expenditures for 2017, 2016 and 2015, as well as total assets at December 31, 2017, 2016 and 2015.

(\$ in millions)	2017		
	Third-party revenues	Intersegment revenues	Total revenues
Electrification Products	9,591	503	10,094
Robotics and Motion	7,882	519	8,401
Industrial Automation	6,725	155	6,880
Power Grids	9,904	490	10,394
Corporate and Other	210	1,535	1,745
Intersegment elimination	—	(3,202)	(3,202)
Consolidated	34,312	—	34,312

	2016		
(\$ in millions)	Third-party revenues	Intersegment revenues	Total revenues
Electrification Products	9,337	583	9,920
Robotics and Motion	7,404	502	7,906
Industrial Automation	6,490	164	6,654
Power Grids	10,097	563	10,660
Corporate and Other	500	1,785	2,285
Intersegment elimination	—	(3,597)	(3,597)
Consolidated	33,828	—	33,828

	2015		
(\$ in millions)	Third-party revenues	Intersegment revenues	Total revenues
Electrification Products	9,634	641	10,275
Robotics and Motion	7,597	591	8,188
Industrial Automation	7,075	144	7,219
Power Grids	10,510	735	11,245
Corporate and Other	665	1,768	2,433
Intersegment elimination	—	(3,879)	(3,879)
Consolidated	35,481	—	35,481

(\$ in millions)	2017	2016	2015
<i>Operational EBITA:</i>			
Electrification Products	1,510	1,459	1,520
Robotics and Motion	1,178	1,223	1,288
Industrial Automation	953	897	977
Power Grids	972	998	810
Corporate and Other and Intersegment elimination	(483)	(386)	(386)
Consolidated Operational EBITA	4,130	4,191	4,209
Acquisition-related amortization	(264)	(279)	(310)
Restructuring and restructuring-related expenses ⁽¹⁾	(363)	(543)	(674)
Non-operational pension cost	42	(38)	(19)
Changes in retained obligations of divested businesses	(94)	—	—
Changes in pre-acquisition estimates	(8)	(131)	(21)
Gains and losses on sale of businesses	252	(10)	(20)
Acquisition-related expenses and certain non-operational items	(322)	(163)	(100)
Foreign exchange/commodity timing differences in income from operations:			
Unrealized gains and losses on derivatives where the underlying hedged transaction has not yet been realized	126	(65)	67
Realized gains and losses on derivatives where the underlying hedged transaction has not yet been realized	32	(5)	(68)
Unrealized foreign exchange movements on receivables/payables (and related assets/liabilities)	(97)	30	(15)
Income from operations	3,434	2,987	3,049
Interest and dividend income	74	73	77
Interest and other finance expense	(277)	(261)	(286)
Income from continuing operations before taxes	3,231	2,799	2,840

(1) Amounts also include the incremental implementation costs in relation to the White Collar Productivity program.

(\$ in millions)	Depreciation and amortization			Capital expenditure ⁽¹⁾			Total assets ⁽¹⁾ at December 31,		
	2017	2016	2015	2017	2016	2015	2017	2016	2015
Electrification Products	315	348	364	218	215	228	10,278	9,881	9,955
Robotics and Motion	216	249	246	118	112	126	8,061	7,943	8,600
Industrial Automation	114	76	80	71	53	57	7,239	4,184	4,586
Power Grids	239	242	259	171	172	150	9,017	8,623	9,032
Corporate and Other	217	220	211	371	279	315	8,667	8,571	8,899
Consolidated	1,101	1,135	1,160	949	831	876	43,262	39,202	41,072

(1) Capital expenditure and Total assets are after intersegment eliminations and therefore reflect third-party activities only.

Geographic information

Geographic information for revenues and long-lived assets was as follows:

(\$ in millions)	Revenues			Long-lived assets at December 31,	
	2017	2016	2015	2017	2016
Europe	11,840	11,315	11,602	3,195	2,768
The Americas	9,713	9,741	10,554	1,151	1,100
Asia, Middle East and Africa	12,759	12,772	13,325	1,017	875
Total	34,312	33,828	35,481	5,363	4,743

Revenues by geography reflect the location of the customer. Approximately 20 percent, 19 percent and 20 percent of the Company's total revenues in 2017, 2016 and 2015, respectively, came from customers in the United States. Approximately 15 percent, 14 percent and 14 percent of the Company's total revenues in 2017, 2016 and 2015, respectively, were generated from customers in China. In 2017, 2016 and 2015, more than 98 percent of the Company's total revenues were generated from customers outside Switzerland.

Long-lived assets represent "Property, plant and equipment, net" and are shown by location of the assets. At December 31, 2017, approximately 16 percent, 15 percent and 10 percent of the Company's long-lived assets were located in the U.S., Switzerland and Sweden, respectively. At December 31, 2016, approximately 17 percent, 17 percent and 10 percent of the Company's long-lived assets were located in Switzerland, the U.S. and Sweden.

The Company does not segregate revenues derived from transactions with external customers for each type or group of products and services. Accordingly, it is not practicable for the Company to present revenues from external customers by product and service type.

EPC business model change

On December 20, 2017, the Company announced a planned change to the management and oversight of the remaining activities of its engineering, procurement and construction (EPC) businesses. Effective January 1, 2018, management responsibility and oversight of certain remaining EPC businesses, currently included in the Power Grids and Robotics and Motion operating segments, will be transferred outside of the respective former operating divisions. The new management structure will result in these businesses being included in Corporate and Other starting in 2018.