

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549
FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2019

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from _____ to _____

Commission File No. 1-9328

ECOLAB INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

41-0231510
(I.R.S. Employer
Identification No.)

1 Ecolab Place, St. Paul, Minnesota 55102
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code: **1-800-232-6522**

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

Title of each class	Trading symbol(s)	Name of each exchange on which registered
Common Stock, \$1.00 par value	ECL	New York Stock Exchange
2.625% Euro Notes due 2025	ECL 25	New York Stock Exchange
1.000% Euro Notes due 2024	ECL 24	New York Stock Exchange

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

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

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

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

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

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

Large accelerated filer
Non-accelerated filer

Accelerated filer
Smaller reporting company
Emerging growth company

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

Indicate by check mark whether the registrant is a shell Company (as defined in Rule 12b-2 of the Exchange Act). YES NO

Aggregate market value of voting and non-voting common equity held by non-affiliates of registrant on June 28, 2019, the last business day of the Registrant's most recently completed second fiscal quarter: \$56,547,973,473 (see Item 12, under Part III hereof), based on a closing price of registrant's Common Stock of \$197.44 per share.

The number of shares of registrant's Common Stock, par value \$1.00 per share, outstanding as of January 31, 2020: 288,166,440 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the Annual Meeting of Stockholders to be held May 7, 2020, and to be filed within 120 days after the registrant's fiscal year ended December 31, 2019 (hereinafter referred to as "Proxy Statement"), are incorporated by reference into Part III.

ECOLAB INC.
FORM 10-K
For the Year Ended December 31, 2019

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PART I

Except where the context otherwise requires, references in this Form 10-K to (i) “Ecolab,” “Company,” “we” and “our” are to Ecolab Inc. and its subsidiaries, collectively; (ii) “Nalco” are to Nalco Company LLC, a wholly-owned subsidiary of the Company; (iii) “Nalco transaction” are to the merger of Ecolab and Nalco Holding Company completed in December 2011; and (iv) “Champion transaction” are to our acquisition of privately held Champion Technologies and its related company Corsicana Technologies in April 2013.

Item 1. Business.

General Development of Business.

Ecolab was incorporated as a Delaware corporation in 1924. Our fiscal year is the calendar year ending December 31. International subsidiaries are included in the consolidated financial statements on the basis of their U.S. GAAP (accounting principles generally accepted in the United States of America) November 30 fiscal year-ends to facilitate the timely inclusion of such entities in our consolidated financial reporting.

On December 18, 2019, we entered into definitive agreements with ChampionX Holding Inc., a wholly owned subsidiary of Ecolab (ChampionX), and Apergy Corporation (Apergy) pursuant to which we will separate the Upstream Energy business of our Global Energy segment and combine it with Apergy in a tax-efficient reverse Morris Trust transaction. Subject to the terms and conditions of those agreements, we will transfer the Upstream Energy business of our Global Energy segment to ChampionX, after which, we will distribute by means of a split-off all of the issued and outstanding shares of common stock of ChampionX held by Ecolab, and immediately after the distribution of ChampionX common stock, a wholly owned subsidiary of Apergy will merge with and into ChampionX, with ChampionX surviving as a wholly owned subsidiary of Apergy and the shares of ChampionX common stock being converted into shares of Apergy common stock. Upon completion of the merger, ChampionX’s stockholders will receive approximately 62% of the outstanding common stock of Apergy on a fully diluted basis. Completion of the transactions is subject to the satisfaction or waiver of customary closing conditions, including approval by Apergy’s stockholders, approval by certain foreign regulatory authorities and receipt of opinions with respect to the tax-free nature of the transactions.

We continued to invest in and build our business through various acquisitions that complement our strategic vision. See Part II, Item 8, Note 4 of this Form 10-K for additional information about the acquisitions and divestitures of the Company.

Narrative Description of Business.

General

With 2019 sales of \$14.9 billion, we believe we are the global leader in water, hygiene and energy technologies and services that protect people and vital resources. We deliver comprehensive programs, products and services to promote safe food, maintain clean environments, optimize water and energy use, and develop and improve operating efficiencies for customers in the food, healthcare, energy, hospitality and industrial markets in more than 170 countries around the world. Our cleaning and sanitizing programs and products, and pest elimination services, support customers in the foodservice, food and beverage processing, hospitality, healthcare, government and education, retail, textile care and commercial facilities management sectors. Our products and technologies are also used in water treatment, pollution control, energy conservation, oil production and refining, primary metals manufacturing, papermaking, mining and other industrial processes.

We pursue a “Circle the Customer – Circle the Globe” strategy by providing an array of innovative programs, products and services designed to meet the specific operational and sustainability needs of our customers throughout the world. Through this strategy and our varied product and service mix, one customer may utilize the offerings of several of our operating segments. Important in our business proposition for customers is our ability to produce improved results while reducing their water and energy use. With that in mind, we focus on continually innovating to optimize both our own operations and the solutions we provide to customers, aligning with our corporate strategy to address some of the world’s most pressing and complex sustainability challenges such as water scarcity and climate change. The work we do matters, and the way we do it matters to our employees, customers, investors and the communities in which we and our customers operate.

Sustainability is core to our business strategy. We deliver sustainable solutions that help companies around the world achieve their business goals while reducing environmental impacts. We partner with customers at approximately three million customer locations around the world to reduce water, energy and greenhouse gas emissions through our high-efficiency solutions in cleaning and sanitation, water, paper and energy services. By partnering with our customers to help them do more with less through the use of our innovative and differentiated solutions, we aim to help our customers conserve more than 300 billion gallons of water annually by 2030. Last year, we helped our customers conserve more than 190 billion gallons of water and avoid more than 1.2 million tons of greenhouse gas emissions.

The following description of our business is based upon our reportable segments as reported in our consolidated financial statements for the year ended December 31, 2019, which are located in Item 8 of Part II of this Form 10-K. Operating segments that share similar economic characteristics and future prospects, nature of the products and production processes, end-use markets, channels of distribution and regulatory environment have been aggregated into three reportable segments: Global Industrial, Global Institutional and Global Energy. Operating segments that were not aggregated and do not exceed the quantitative criteria to be separately reported have been combined into Other. We provide similar information for Other as compared to our three reportable segments as we consider the information regarding its underlying operating segments as useful in understanding our consolidated results.

Global Industrial

This reportable segment consists of the Water, Food & Beverage, Paper, Life Sciences and Textile Care operating segments, which provide water treatment and process applications, and cleaning and sanitizing solutions, primarily to large industrial customers within the manufacturing, food and beverage processing, transportation, chemical, primary metals and mining, power generation, pulp and paper, pharmaceutical and commercial laundry industries. The underlying operating segments exhibit similar manufacturing processes, distribution methods and economic characteristics. Descriptions of the five operating segments which comprise our Global Industrial reportable segment follow below.

Water

Water serves customers across industrial and institutional markets. Within Water, our light industry markets include food and beverage, manufacturing and transportation, and institutional clients including commercial buildings, hospitals, universities and hotels. Heavy industries served include power, chemicals and primary metals and mining.

Water provides water treatment products and water technologies programs for cooling water, waste water, boiler water and process water applications. Our cooling water treatment programs are designed to control challenges associated with cooling water systems — corrosion, scale and microbial fouling and contamination — in open recirculating, once-through and closed systems. Our wastewater products and programs focus on improving overall plant economics, addressing compliance issues, optimizing equipment efficiency and improving operator capabilities and effectiveness. We provide integrated chemical solutions, process improvements and mechanical component modifications to optimize boiler performance and control corrosion and scale build-up. Our programs assist in the use of water for plant processes by optimizing the performance of treatment chemicals and equipment in order to minimize costs and maximize returns on investment.

Our offerings include specialty products such as scale and corrosion inhibitors, antifoulants, pre-treatment solutions, membrane treatments, coagulants and flocculants, and anti-foamers, as well as our 3D TRASAR™ technology, which combines chemistry, remote services and monitoring and control. We provide products and programs for water treatment and process applications aimed at combining environmental benefits with economic gains for our customers. Typically, water savings, energy savings, and operating efficiency are among our primary sources of value creation for our customers, with product quality and production enhancement improvements also providing key differentiating features for many of our offerings. Our offerings are sold primarily by our corporate account and field sales employees.

We believe we are one of the leading global suppliers of products and programs for chemical applications within the industrial water treatment industry.

Food & Beverage

Food & Beverage addresses cleaning and sanitation to facilitate the processing of products for human consumption. Food & Beverage provides detergents, cleaners, sanitizers, lubricants and animal health products, as well as cleaning systems, electronic dispensers and chemical injectors for the application of chemical products, primarily to dairy plants, dairy farms, breweries, soft-drink bottling plants, and meat, poultry and other food processors. Food & Beverage is also a leading developer and marketer of antimicrobial products used in direct contact with meat, poultry, seafood and produce during processing in order to reduce microbial contamination. Food & Beverage also designs, engineers and installs CIP (“clean-in-place”) process control systems and facility cleaning systems for its customer base. Water savings, energy savings, and operating efficiency are among our sources of value creation for our customers. Products for use in processing facilities are sold primarily by our corporate account and field sales employees, while products for use on farms are sold through dealers and independent, third-party distributors.

We believe we are one of the leading global suppliers of cleaning and sanitizing products to the dairy plant, dairy farm, food, meat and poultry, and beverage/brewery processor industries.

Paper

Paper provides water and process applications for the pulp and paper industries, offering a comprehensive portfolio of programs that are used in all principal steps of the papermaking process and across all grades of paper, including graphic grades, board and packaging, and tissue and towel. Paper provides its customers similar types of products and programs for water treatment and wastewater treatment as those offered by Water. Also, Paper offers two specialty programs that differentiate its offerings from Water—pulp applications and paper applications. Our pulp applications maximize process efficiency and increase pulp cleanliness and brightness in bleaching operations, as well as predict and monitor scaling potential utilizing on-line monitoring to design effective treatment programs and avoid costly failures. Our paper process applications focus on improving our customers’ operational efficiency, in part through water savings, energy savings and operating efficiency. Advanced sensing, monitoring and automation combine with innovative chemistries and detailed process knowledge to provide a broad range of customer solutions. Specialty products include flocculants, coagulants, dewatering aids, and digester yield additives. Our offerings are sold primarily by our corporate account and field sales employees.

We believe we are one of the leading global suppliers of water treatment products and process aids to the pulp and papermaking industry.

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Life Sciences

Life Sciences provides end-to-end contamination control, cleaning and sanitizing solutions to personal care and pharmaceutical manufacturers. Life Sciences provides detergents, cleaners, sanitizers, disinfectants, as well as cleaning systems, electronic dispensers and chemical injectors for the application of chemical products. Additionally, we sell sterile alcohols, sterile biocides, residue removal and dilution solutions, surface wipes, dispensing equipment and aerosol sprays, which are primarily for application within clean room environments. The portfolio also includes decontamination systems and services utilizing hydrogen peroxide vapor. Products and programs are sold primarily through our field sales personnel and corporate account personnel, and to a lesser extent through distributors.

Life Sciences is comprised of customers and accounts related to manufacturing in the following industries: pharmaceutical, animal health and medicine, biologic products, cosmetics and medical devices. Our tailored, comprehensive solutions and technical know-how focus on ensuring product quality, safety and compliance standards are met while improving operational efficiency in customers' cleaning, sanitation and disinfection processes.

Textile Care

Textile Care provides products and services that manage the entire wash process through custom designed programs, premium products, dispensing equipment, water and energy management and reduction, and real time data management for large scale, complex commercial laundry operations including uniform rental, hospitality, linen rental and healthcare laundries. Textile Care's programs are designed to meet our customers' needs for exceptional cleaning, while extending the useful life of linen and reducing our customers' overall operating costs. Products and programs are marketed primarily through our field sales employees and, to a lesser extent, through distributors.

We believe we are one of the leading global suppliers in the laundry markets in which we compete.

Global Institutional

This reportable segment consists of the Institutional, Specialty and Healthcare operating segments, which provide specialized cleaning and sanitizing products to the foodservice, hospitality, lodging, healthcare, government, education and retail industries. The underlying operating segments exhibit similar manufacturing processes, distribution methods and economic characteristics. Descriptions of the three operating segments which comprise our Global Institutional reportable segment follow below.

Institutional

Institutional sells specialized cleaners and sanitizers for washing dishes, glassware, flatware, foodservice utensils and kitchen equipment ("warewashing"), plus specialized cleaners for various applications throughout food service operations, for on-premise laundries (typically used by hotel and healthcare customers) and for general housekeeping functions. We also sell food safety products and equipment, water filters, dishwasher racks and related kitchen sundries to the foodservice, lodging, educational and healthcare industries. Institutional also provides pool and spa treatment programs for hospitality and other commercial customers, as well as a broad range of janitorial cleaning and floor care products and programs to customers in hospitality, healthcare and commercial facilities. Institutional develops various chemical dispensing systems which are used by our customers to efficiently and safely dispense our cleaners and sanitizers, and through these products, systems and our on-site sales and service expertise, develop better results for our customers while also developing water savings, energy savings and operating efficiency. In addition, Institutional markets a lease program comprised of energy-efficient dishwashing machines, detergents, rinse additives and sanitizers, including full machine maintenance. Through our EcoSure Food Safety Management business, Institutional also provides customized on-site evaluations, training and quality assurance services to foodservice operations.

Institutional sells its products and programs primarily through its direct field sales and corporate account sales personnel. Corporate account sales personnel establish relationships and negotiate contracts with larger multi-unit or "chain" customers. We also utilize independent, third-party foodservice, broad-line and janitorial distributors to provide logistics to end customers that prefer to work through these distributors. Many of these distributors also participate in marketing our product and service offerings to the end customers. Through our field sales personnel, we generally provide the same customer support to end-use customers supplied by these distributors as we do to direct customers.

We believe we are one of the leading global suppliers of warewashing and laundry products and programs to the food service, hospitality and lodging markets.

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Specialty

Specialty supplies cleaning and sanitizing chemical products and related items primarily to regional, national and international quick service restaurant ("QSR") chains and food retailers (i.e., supermarkets and grocery stores). Its products include specialty and general purpose hard surface cleaners, degreasers, sanitizers, polishes, hand care products and assorted cleaning tools and equipment which are primarily sold under the "Ecolab" and "Kay" brand names. Specialty's cleaning and sanitation programs are customized to meet the needs of the market segments it serves and are designed to provide highly effective cleaning performance, promote food safety, reduce labor, water and energy costs and enhance user and guest safety. A number of dispensing options are available for products in the core product range. Specialty supports its product sales with training programs and technical support designed to meet the special needs of its customers.

Both Specialty's QSR business and its food retail business utilize their corporate account sales force which manages relationships with customers at the corporate and regional office levels (and, in the QSR market segment, at the franchisee level) and their field sales force which provides program support at the individual restaurant or store level. QSR customers are primarily supplied through third party distributors while most food retail customers utilize their own distribution networks. While Specialty's customer base has broadened over the years, Specialty's business remains largely dependent upon a limited number of major QSR chains and franchisees and large food retail customers.

We believe we are one of the leading suppliers of cleaning and sanitizing products to the global QSR market and a leading supplier of cleaning and sanitizing products to the global food retail market.

Healthcare

Healthcare provides infection prevention and surgical solutions to acute care hospitals, surgery centers and medical device Original Equipment Manufacturers ("OEM"). Healthcare's proprietary infection prevention and surgical solutions (hand hygiene, hard surface disinfection, instrument cleaning, patient drapes, equipment drapes and surgical fluid warming and cooling systems) are sold primarily under the "Ecolab," "Microtek," and "Anios" brand names to various departments within the acute care environment (Infection Control, Environmental Services, Central Sterile and Operating Room). Healthcare sells its products and programs primarily through its field sales personnel and corporate account personnel but also sells through healthcare distributors.

We believe we are a leading supplier of infection prevention and surgical solutions in the United States and Europe.

Global Energy

This reportable segment consists of the Energy operating segment, which serves the process chemicals and water treatment needs of the global petroleum and petrochemical industries in both upstream and downstream applications.

Energy provides on-site, technology-driven solutions to the global drilling and completion, oil and gas production and refining and petrochemical industries. Our product portfolio includes: additives for drilling and well stimulation, corrosion inhibitors, oil and water separation, scale control, paraffin and asphaltene control, biocides, hydrate control, hydrogen sulfide removal, oil dispersants, foamers and anti-foamers, flow improvers, anti-foulants, crude desalting, monomer inhibitors, anti-oxidants, fuel and lubricant additives, and traditional water treatment.

The Energy operating segment operates under an upstream group comprised of the WellChem and Oil Field Chemicals businesses (which is being renamed ChampionX) and a downstream refinery and petrochemical processing group. ChampionX provides solutions to the oil and gas production sector, including crude oil and natural gas production, pipeline gathering/transmission systems, gas processing, heavy oil and bitumen upgrading, water management and enhanced oil recovery. ChampionX also supplies chemicals for the cementing, drilling, fracturing and acidizing phases of well drilling and stimulation. Our priority is to safely manage the critical challenges facing today's oil and gas producers throughout the life cycle of their assets, with such an approach helping our customers minimize risk, achieve their production targets and maximize profitability. Our downstream group provides products and programs for process and water treatment applications specific to the petroleum refining and fuels industry, enabling our customers to profitably refine and upgrade hydrocarbons. Our heavy oil upgrading programs minimize operational costs and mitigate fouling, corrosion, foaming and the effects of heavy metals during the refining process. We also offer fuel additives, including corrosion inhibitors, to protect engine fuel systems and pre-market underground storage tanks and piping. Our customers include many of the largest publicly traded oil and gas companies, as well as national oil and gas companies and large independent oil and gas companies and service companies. Our Energy offerings are sold primarily by our corporate account and field sales employees and, to a lesser extent, through distributors, sales agents and joint ventures.

We believe we are one of the leading global providers of specialty chemicals to the upstream oil and gas industry, and downstream refineries and petrochemical operations.

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Other

Other consists of the Pest Elimination, Colloidal Technologies Group and (prior to its sale in November 2017) Equipment Care, operating segments. These operating segments do not meet the quantitative criteria to be separately reported. We disclose these operating segments within Other as we consider the information useful in understanding our consolidated results.

Pest Elimination

Pest Elimination provides services designed to detect, eliminate and prevent pests, such as rodents and insects, in restaurants, food and beverage processors, educational and healthcare facilities, hotels, quick service restaurant and grocery operations and other institutional and commercial customers. The services of Pest Elimination are sold and performed by our field sales and service personnel.

Pest Elimination continues to expand its geographic coverage. In addition to the United States, which constitutes the largest operation, we operate in various countries in Asia Pacific, Western Europe, Latin America and South Africa, with the largest operations in France, the United Kingdom and Greater China.

We believe Pest Elimination is a leading supplier of pest elimination programs to the commercial, hospitality and institutional markets in the geographies it serves.

Colloidal Technologies Group

The Colloidal Technologies Group ("CTG") produces and sells colloidal silica, which is comprised of nano-sized particles of silica in water. These products and associated programs are used primarily for binding and polishing applications. CTG serves customers across various industries, including semiconductor manufacturing, catalyst manufacturing, chemicals, and aerospace component manufacturing.

CTG incorporates strong collaboration with customers to develop customized solutions that meet the technical demands of their operations. Our silica-based applications are widely used for polishing of silicon wafers, semiconductor substrates and the precision surface finishing of optics, watch crystals and other glass components. We offer a variety of silica-based particles that can be used as binders in heterogeneous catalyst systems and as silica nutrients for manufacturing specialty zeolites. Our silica products are used worldwide as a binder for precision investment casting slurries, which ultimately facilitate the manufacture of near net-shape metal parts such as turbine blades and golf club heads.

Our products are sold primarily by our corporate account employees. We believe we are one of the leading global suppliers of colloidal silica.

Equipment Care

Prior to its sale in November 2017, Equipment Care provided equipment repair, maintenance and preventive maintenance services for the commercial food service industry. Repair services were offered for in-warranty repair, acting as the manufacturer's authorized service agent, as well as after-warranty repair. In addition, Equipment Care operated as a parts distributor to repair service companies and end-use customers.

Additional Information

International Operations

We directly operate in approximately 100 countries outside of the United States through wholly-owned subsidiaries or, in some cases, through a joint venture with a local partner. In certain countries, selected products are sold by our export operations to distributors, agents or licensees, although the volume of those sales is not significant in terms of our overall revenues. In general, our businesses conducted outside the United States are similar to those conducted in the United States.

Our business operations outside the United States are subject to the usual risks of foreign operations, including possible changes in trade and foreign investment laws, international business laws and regulations, tax laws, currency exchange rates and economic and political conditions. The profitability of our international operations is generally lower than the profitability of our businesses in the United States, due to (i) the additional cost of operating in numerous and diverse foreign jurisdictions with varying laws and regulations, (ii) higher costs of importing certain raw materials and finished goods in some regions, (iii) the smaller scale of international operations where certain operating locations are smaller in size, and (iv) the additional reliance on distributors and agents in certain countries which can negatively impact our margins. Proportionately larger investments in sales and technical support are also necessary in certain geographies in order to facilitate the growth of our international operations.

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Competition

In general, the markets in which the businesses in our Global Industrial reportable segment compete are led by a few large companies, with the rest of the market served by smaller entities focusing on more limited geographic regions or a smaller subset of products and services. Our businesses in this segment compete on the basis of their demonstrated value, technical expertise, innovation, chemical formulations, customer support, detection equipment, monitoring capabilities, and dosing and metering equipment.

The businesses in our Global Institutional reportable segment and Other have two significant classes of competitors. First, we compete with a small number of large companies selling directly or through distributors on a national or international scale. Second, we have numerous smaller regional or local competitors which focus on more limited geographies, product lines and/or end-use customer segments. We compete principally by providing superior value, premium customer support, and innovative and differentiated products to help our customers protect their brand reputation.

Our Global Energy reportable segment competes with a limited number of multinational companies, with the remainder of the market comprised of smaller, regional niche companies focused on limited geographic areas. We compete in this business on the basis of our product quality, technical expertise, chemical formulations, effective global supply chain, strong customer service and emphasis on safety and environmental leadership.

Sales

Products, systems and services are primarily marketed in domestic and international markets by our Company-trained direct field sales personnel who also advise and assist our customers in the proper and most efficient use of the products and systems in order to meet a full range of cleaning and sanitation, water treatment and process chemistry needs. Independent, third-party distributors and, to a lesser extent, sales agents, are utilized in several markets, as described in the segment descriptions found above.

Number of Employees

We had 50,200 employees as of December 31, 2019.

Customers and Classes of Products

We believe our business is not materially dependent upon a single customer. Additionally, although we have a diverse customer base and no customer or distributor constituted 10 percent or more of our consolidated revenues in 2019, 2018 or 2017, we do have customers and independent, third-party distributors, the loss of which could have a material adverse effect on results of operations for the affected earnings periods; however, we consider it unlikely that such an event would have a material adverse impact on our financial position. No material part of our business is subject to renegotiation or termination at the election of a governmental unit.

We sold one class of products within the Global Institutional reportable segment which comprised 10% or more of consolidated net sales in the last three years. Sales of warewashing products were approximately 11% of consolidated net sales in each of the years.

Patents and Trademarks

We own and license a number of patents, trademarks and other intellectual property. While we have an active program to protect our intellectual property by filing for patents or trademarks and pursuing legal action, when appropriate, to prevent infringement, except for the items listed below, we do not believe our overall business is materially dependent on any individual patent or trademark.

- Patents related to our TRASAR and 3D TRASAR technology, which are material to our Global Industrial reportable segment. U.S. and foreign patents protect aspects of our key TRASAR and 3D TRASAR technology until at least 2024.
- Trademarks related to Ecolab, Nalco and 3D TRASAR, which collectively are material to all of our reportable segments. The Ecolab, Nalco and 3D TRASAR trademarks are registered or applied for in all of our key markets, and we anticipate maintaining them indefinitely.

Seasonality

We experience variability in our quarterly operating results due to seasonal sales volume and business mix fluctuations in our operating segments. Part II, Item 8, Note 19, entitled "Quarterly Financial Data" of this Form 10-K is incorporated herein by reference.

Investments in Equipment

We have no unusual working capital requirements. We have invested in the past, and will continue to invest in the future, in process control and monitoring equipment consisting primarily of systems used by customers to dispense our products as well as to monitor water systems. The investment in such equipment is discussed under the heading "Investing Activities" in Management's Discussion and Analysis of Financial Condition and Results of Operations of this Form 10-K.

Manufacturing and Distribution

We manufacture most of our products and related equipment in Company-operated manufacturing facilities. Some products are also produced for us by third-party contract manufacturers. Other products and equipment are purchased from third-party suppliers. Additional information on product/equipment sourcing is found in the segment discussions above and additional information on our manufacturing facilities is located under Part I, Item 2. "Properties," of this Form 10-K.

Deliveries to customers are made from our manufacturing plants and a network of distribution centers and third-party logistics service providers. We use common carriers, our own delivery vehicles, and distributors for transport. Additional information on our plant and distribution facilities is located under Part I, Item 2. "Properties," of this Form 10-K.

Raw Materials

Raw materials purchased for use in manufacturing our products are inorganic chemicals, including alkalis, acids, biocides, phosphonates, phosphorous materials, silicates and salts; and organic chemicals, including acids, alcohols, amines, fatty acids, surfactants, solvents, monomers and polymers. Healthcare purchases plastic films and parts to manufacture medical devices that serve the surgical and infection prevention markets. Pesticides used by Pest Elimination are purchased as finished products under contract or purchase order from the producers or their distributors. We also purchase packaging materials for our manufactured products and components for our specialized cleaning equipment and systems. We purchase more than 10,000 raw materials, with the largest single raw material representing less than 4% of raw material purchases. Our raw materials, with the exception of a few specialized chemicals which we manufacture, are generally purchased on an annual contract basis and are ordinarily available in adequate quantities from a diverse group of suppliers globally. When practical, global sourcing is used so that purchasing or production locations can be shifted to control product costs at globally competitive levels.

Research and Development

Our research and development program consists principally of developing and validating the performance of new products, processes, techniques and equipment, improving the efficiency of those already existing, improving service program content, evaluating the environmental compatibility of products and technical support. Key disciplines include analytical and formulation chemistry, microbiology, data science and predictive analytics, process and packaging engineering, remote monitoring engineering and product dispensing technology. Substantially all of our principal products have been developed by our research, development and engineering personnel.

We believe continued research and development activities are critical to maintaining our leadership position within the industry and will provide us with a competitive advantage as we seek additional business with new and existing customers.

Joint Ventures

Over time, we have entered into partnerships or joint ventures in order to meet local ownership requirements, to achieve quicker operational scale, to expand our ability to provide our customers a more fully integrated offering or to provide other benefits to our business or customers. During 2019, the impact on our consolidated net income of our joint ventures, in the aggregate, was approximately three percent. The table below identifies our most significant consolidated and non-consolidated joint ventures, summarized by the primary purpose of the joint venture.

Local Ownership Requirements / Geographic Expansion		
Joint Venture	Location	Segment
Nalco Saudi Co. Limited	Saudi Arabia	Global Energy, Global Industrial
ChampionX Oilfield Solutions Nigeria Limited	Nigeria	Global Energy
ChampionX Equatorial Guinea, S.A.R.L.	Equatorial Guinea	Global Energy
ChampionX Químicos, Limitada	Angola	Global Energy
RauanNalco LLP	Kazakhstan	Global Energy
Operational Scale / Geographic Critical Mass		
Joint Venture	Location	Segment
Katayama Nalco Inc.	Japan	Global Industrial
Technology / Expanded Product Offering / Manufacturing Capability		
Joint Venture	Location	Segment
Derypol, S.A.	Spain	Global Industrial
Century LLC	United States	Global Institutional

We will continue to evaluate the potential for partnerships and joint ventures that can assist us in increasing our geographic, technological and product reach.

Environmental and Regulatory Considerations

Our businesses are subject to various legislative enactments and regulations relating to the protection of the environment and public health. While we cooperate with governmental authorities and take commercially practicable measures to meet regulatory requirements and avoid or limit environmental effects, some risks are inherent in our businesses. Among the risks are costs associated with transporting and managing hazardous materials and waste disposal and plant site clean-up, fines and penalties if we are found to be in violation of law, as well as modifications, disruptions or discontinuation of certain operations or types of operations including product recalls and reformulations. Similarly, the need for certain of our products and services is dependent upon or might be limited by governmental laws and regulations. Changes in such laws and regulations, including among others, air pollution regulations and regulations relating to oil and gas production (including those related to hydraulic fracturing), could impact the sales of some of our products or services. In addition to an increase in costs of manufacturing and delivering products, a change in production regulations or product regulations could result in interruptions to our business and potentially cause economic or consequential losses should we be unable to meet the demands of our customers for products.

Additionally, although we are not currently aware of any such circumstances, there can be no assurance that future legislation or enforcement policies will not have a material adverse effect on our consolidated results of operations, financial position or cash flows. Environmental and regulatory matters most significant to us are discussed below.

Ingredient Legislation: Various laws and regulations have been enacted by state, local and foreign jurisdictions pertaining to the sale of products which contain phosphorous, volatile organic compounds, or other ingredients that may impact human health or the environment. Under California Proposition 65, for example, label disclosures are required for certain products containing chemicals listed by California. Chemical management initiatives that promote pollution prevention through research and development of safer chemicals and safer chemical processes are being advanced by certain states, including California, Maine, Maryland, Massachusetts, Minnesota, Oregon and South Carolina.

Environmentally preferable purchasing programs for cleaning products have been enacted in a number of states to date, and in recent years have been considered by several other state legislatures. Cleaning product ingredient disclosure legislation has been introduced in the U.S. Congress in each of the past few years but has not passed, and several states are considering further regulations in this area. In 2017, California passed the Cleaning Product Right to Know Act of 2017, that will require ingredient transparency on-line and on-label by 2020 and 2021, respectively. New York has published ingredient disclosure guidance based on existing regulation but final compliance has been delayed due to litigation. The U.S. Government is monitoring "green chemistry" initiatives through a variety of initiatives, including its "Design for the Environment" ("DfE")/"Safer Choice" program. DfE/Safer Choice has three broad areas of work (recognition of safer products on a DfE/Safer Choice label, development of best practices for industrial processes and evaluation of safer chemicals), and we are involved in these to varying degrees. Our Global Institutional and Global Industrial cleaning products are subject to the regulations and may incur additional stay-in-market expenses associated with conducting the required alternatives analyses for chemicals of concern. To date, we generally have been able to comply with such legislative requirements by reformulation or labeling modifications. Such legislation has not had a material adverse effect on our consolidated results of operations, financial position or cash flows to date.

TSCA: The nation's primary chemicals management law, the Toxic Substances Control Act ("TSCA"), was updated for the first time in 40 years with the passage of the Frank R. Lautenberg Chemical Safety for the 21st Century Act ("LCSEA") in 2016. The LCSEA modernizes the original 1976 legislation, aiming to establish greater public confidence in the safety of chemical substances in commerce, improve the U.S. Environmental Protection Agency's ("EPA") capability and authority to regulate existing and new chemical substances, and prevent further state action or other notification programs like REACH (see below). For Ecolab, the TSCA changes mainly impact testing and submission costs for new chemical substances in the United States. In addition, the EPA likely will be more aggressively using the existing TSCA tools to manage chemicals of concern. We anticipate that compliance with new requirements under TSCA could be similar to the costs associated with REACH in the European Union, which is discussed below.

REACH: The European Union has enacted a regulatory framework for the Registration, Evaluation and Authorization of Chemicals ("REACH"). It established a new European Chemicals Agency ("ECHA") in Helsinki, Finland, which is responsible for evaluating data to determine hazards and risks and to manage this program for authorizing chemicals for sale and distribution in Europe. We met the pre-registration requirements of REACH, and the 2010, 2013 and 2018 registration deadlines. To help manage this program, we have been simplifying our product lines and working with chemical suppliers to comply with registration requirements. In addition, Korea, Taiwan, Turkey and other countries are implementing similar requirements. Potential costs to us are not yet fully quantifiable but are not expected to have a material adverse effect on our consolidated results of operations or cash flows in any one reporting period or on our financial position.

GHS: In 2003, the United Nations adopted a standard on hazard communication and labeling of chemical products known as the Globally Harmonized System of Classification and Labeling of Chemicals ("GHS"). GHS is designed to facilitate international trade and increase safe handling and use of hazardous chemicals through a worldwide system that classifies chemicals based on their intrinsic hazards and communicates information about those hazards through standardized product labels and safety data sheets ("SDSs"). Most countries in which we operate will adopt GHS-related legislation by 2020, and numerous countries already have done so. The primary cost of compliance revolves around reclassifying products and revising SDSs and product labels. We met the 2015 deadlines in the U.S. and European Union and are working toward a phased-in approach to mitigate the costs of GHS implementation in remaining countries (e.g., Peru, Chile, India). Potential costs to us are not expected to have a material adverse effect on our consolidated results of operations or cash flows in any one reporting period or on our financial position.

Pesticide and Biocide Legislation: Various international, federal and state environmental laws and regulations govern the manufacture and/or use of pesticides. We manufacture and sell certain disinfecting, sanitizing and material preservation products that kill or reduce microorganisms (bacteria, viruses, fungi) on hard environmental surfaces, in process fluids and on certain food products. Such products constitute "pesticides" or "antimicrobial pesticides" under the current definitions of the Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA"), as amended by the Food Quality Protection Act of 1996, the principal federal statute governing the manufacture, labeling, handling and use of pesticides. We maintain several hundred product registrations with the U.S. Environmental Protection Agency ("EPA"). Registration entails the necessity to meet certain efficacy, toxicity and labeling requirements and to pay on-going registration fees. In addition, each state in which these products are sold requires registration and payment of a fee. In general, the states impose no substantive requirements different from those required by FIFRA. However, California and certain other states have adopted additional regulatory programs, and California imposes a tax on total pesticide sales in that state. While the cost of complying with rules as to pesticides has not had a material adverse effect on our consolidated results of operations, financial condition, or cash flows to date, the costs and delays in receiving necessary approvals for these products continue to increase. Total fees paid to the EPA and the states to obtain or maintain pesticide registrations are not expected to significantly affect our consolidated results of operations or cash flows in any one reporting period or our financial position.

In Europe, the Biocidal Products Regulation established a program to evaluate and authorize marketing of biocidal active substances and products. We are working with suppliers and industry groups to manage these requirements and have met the first relevant deadline of the program by the timely submission of dossiers for active substances. Anticipated registration costs, which will be incurred through the multi-year phase-in period, will be significant; however, these costs are not expected to significantly affect our consolidated results of operations or cash flows in any one reporting period or our financial position. The same is true for emerging biocide regulations in Asia.

In addition, Pest Elimination applies restricted-use pesticides that it generally purchases from third parties. That business must comply with certain standards pertaining to the use of such pesticides and to the licensing of employees who apply such pesticides. Such regulations are enforced primarily by the states or local jurisdictions in conformity with federal regulations. We have not experienced material difficulties in complying with these requirements.

FDA Antimicrobial Product Requirements: Various laws and regulations have been enacted by federal, state, local and foreign jurisdictions regulating certain products manufactured and sold by us for controlling microbial growth on humans, animals and foods. In the United States, these requirements generally are administered by the U.S. Food and Drug Administration ("FDA"). However, the U.S. Department of Agriculture and EPA also may share in regulatory jurisdiction of antimicrobials applied to food. The FDA codifies regulations for these product categories in order to ensure product quality, safety and effectiveness. The FDA also has been expanding requirements applicable to such products, including proposing regulations for over-the-counter antiseptic drug products, which may impose additional requirements associated with antimicrobial hand care products and associated costs when finalized by the FDA. FDA regulations associated with the Food Safety Modernization Act may impose additional requirements related to safety product lines. To date, such requirements have not had a material adverse effect on our consolidated results of operations, financial position or cash flows.

Medical Device and Drug Product Requirements: As a manufacturer, distributor and marketer of medical devices and human drugs, we also are subject to regulation by the FDA and corresponding regulatory agencies of the state, local and foreign governments in which we sell our products. These regulations govern the development, testing, manufacturing, packaging, labeling, distribution and marketing of medical devices and medicinal products. We also are required to register with the FDA as a medical device and drug manufacturer, comply with post-market reporting (e.g., Adverse Event Reporting, MDR and Recall) requirements, and to comply with the FDA's current Good Manufacturing Practices and Quality System Regulations which require that we have a quality system for the design and production of our products intended for commercial distribution in the United States and satisfy recordkeeping requirements with respect to our manufacturing, testing and control activities. Countries in the European Union require that certain products being sold within their jurisdictions obtain a "CE mark," an international symbol of adherence to quality assurance standards, and be manufactured in compliance with certain requirements (e.g., Medical Device Directive 93/42/EE, Medical Device Regulation, and ISO 13485). We have CE mark approval to sell various medical device and medicinal products in Europe. Our other international non-European operations also are subject to government regulation and country-specific rules and regulations. Regulators at the federal, state and local level have imposed, are currently considering and are expected to continue to impose regulations on medical devices and drug products. No prediction can be made of the potential effect of any such future regulations, and there can be no assurance that future legislation or regulations will not increase the costs of our products or prohibit the sale or use of certain products.

Equipment: Ecolab's products are dispensed by equipment that is subject to state and local regulatory requirements, as well as being subject to UL, NSF, and other approval requirements. We have both dedicated manufacturing facilities and third-party production of our equipment. We are developing processes to monitor and manage changing regulatory regimes and assist with equipment systems compliance. To date, such requirements have not had a material adverse effect on our consolidated results of operations, financial position or cash flows.

Other Environmental Legislation: Our manufacturing plants are subject to federal, state, local or foreign jurisdiction laws and regulations relating to discharge of hazardous substances into the environment and to the transportation, handling and disposal of such substances. The primary federal statutes that apply to our activities in the United States are the Clean Air Act, the Clean Water Act and the Resource Conservation and Recovery Act. We are also subject to the Superfund Amendments and Reauthorization Act of 1986, which imposes certain reporting requirements as to emissions of hazardous substances into the air, land and water. The products we produce and distribute into Europe are also subject to directives governing electrical waste (WEEE Directive 2012/19/EU) and restrictive substances (RoHS Directive 2011/65/EU). Similar legal requirements apply to Ecolab's facilities globally. We make capital investments and expenditures to comply with environmental laws and regulations, to promote employee safety and to carry out our announced environmental sustainability principles. To date, such expenditures have not had a significant adverse effect on our consolidated results of operations, financial position or cash flows. Our capital expenditures for environmental, health and safety projects worldwide were approximately \$54 million in 2019 and \$60 million in 2018. Approximately \$56 million has been budgeted globally for projects in 2020.

Climate Change: Various laws and regulations pertaining to climate change have been implemented or are being considered for implementation at the international, national, regional and state levels, particularly as they relate to the reduction of greenhouse gas ("GHG") emissions. None of these laws and regulations directly apply to Ecolab at the present time; however, as a matter of corporate policy, we support a balanced approach to reducing GHG emissions while sustaining economic growth.

Furthermore, climate-related risks are assessed within our Enterprise Risk Management process and Annual Business Significance Risks Assessment, which is aligned with recommendations of the Financial Stability Board (FSB) Task Force on Climate-related Financial Disclosures (TCFD). We report TCFD disclosures in our annual Carbon Disclosure Project Climate report located at <https://www.ecolab.com/sustainability/download-sustainability-reports>. We are evaluating further application of the recommendations of the TCFD over the next three to five years, in alignment with the recommended timeline from the TCFD.

To further bolster our climate commitment, in December 2019, we announced new goals to reduce carbon emissions in half by 2030 and to net zero by 2050 and move to 100% renewable energy with positive implications for long-term risk management. We made these commitments as a part of aligning with the United Nations Global Compact's Business Ambition for 1.5°C.

Our current global sustainability targets were established in 2016. They include a 25 percent reduction in water withdrawals and a 10 percent reduction in GHG emissions by 2020. In addition to our internal sustainability performance, we partner with customers at more than three million customer locations around the world to reduce energy and GHG emissions through our high-efficiency solutions in cleaning and sanitation, water, paper and energy services. We also introduced a customer impact goal for the first time. By partnering with our customers to help them do more with less through the use of our solutions, we aim to help our customers conserve more than 300 billion gallons of water annually by 2030.

Environmental Remediation and Proceedings: Along with numerous other potentially responsible parties ("PRP"), we are currently involved with waste disposal site clean-up activities imposed by the federal Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") or state equivalents at 27 sites in the United States. Additionally, we have similar liability at eight sites outside the United States. In general, under CERCLA, we and each other PRP that actually contributed hazardous substances to a Superfund site are jointly and severally liable for the costs associated with cleaning up the site. Customarily, the PRPs will work with the EPA to agree and implement a plan for site remediation.

Based on an analysis of our experience with such environmental proceedings, our estimated share of all hazardous materials deposited on the sites referred to in the preceding paragraph, and our estimate of the contribution to be made by other PRPs which we believe have the financial ability to pay their shares, we have accrued our best estimate of our probable future costs relating to such known sites. In establishing accruals, potential insurance reimbursements are not included. The accrual is not discounted. It is not feasible to predict when the amounts accrued will be paid due to the uncertainties inherent in the environmental remediation and associated regulatory processes.

We have also been named as a defendant in lawsuits where our products have not caused injuries, but the claimants wish to be monitored for potential future injuries. We cannot predict with certainty the outcome of any such tort claims or the involvement we or our products might have in such matters in the future, and there can be no assurance that the discovery of previously unknown conditions will not require significant expenditures. In each of these chemical exposure cases, our insurance carriers have accepted the claims on our behalf (with or without reservation) and our financial exposure should be limited to the amount of our deductible; however, we cannot predict the number of claims that we may have to defend in the future and we may not be able to continue to maintain such insurance.

We have also been named as a defendant in a number of lawsuits alleging personal injury due to exposure to hazardous substances, including multi-party lawsuits alleging personal injury in connection with our products and services. While we do not believe that any of these suits will be material to us based upon present information, there can be no assurance that these environmental matters could not have, either individually or in the aggregate, a material adverse effect on our consolidated results of operations, financial position or cash flows.

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Our worldwide net expenditures for contamination remediation were approximately \$2 million in 2019 and \$3 million in 2018. Our worldwide accruals at December 31, 2019 for probable future remediation expenditures, excluding potential insurance reimbursements, totaled approximately \$16 million. We review our exposure for contamination remediation costs periodically and our accruals are adjusted as considered appropriate. While the final resolution of these issues could result in costs below or above current accruals and, therefore, have an impact on our consolidated financial results in a future reporting period, we believe the ultimate resolution of these matters will not have a material effect on our consolidated results of operations, financial position or cash flows.

Iran Threat Reduction and Syria Human Rights Act of 2012

Under the Iran Threat Reduction and Syria Human Rights Act of 2012, which added Section 13(r) of the Securities Exchange Act of 1934, the Company is required to disclose in its periodic reports if it or any of its affiliates knowingly engaged in certain activities, transactions or dealings relating to Iran or with entities or individuals designated pursuant to certain Executive Orders. Disclosure is required even where the activities are conducted outside the U.S. by non-U.S. affiliates in compliance with applicable law, and even if the activities are not covered or prohibited by U.S. law.

As authorized by the U.S. Treasury's Office of Foreign Assets Control (OFAC), a non-U.S. subsidiary of the Company completed sales of products used for process and water treatment applications in upstream oil and gas production related to the operation of and production from the Rhum gas field off the Scottish coast (Rhum) totaling \$0.7 million during the subsidiary's fiscal year ended November 30, 2019, and a nominal amount of sales of such products during December 2019. The net profit before taxes associated with these sales for each period were \$0.1 million and nominal, respectively. Rhum is jointly owned by Serica Energy plc and Iranian Oil Company (U.K.) Limited. Our non-U.S. subsidiary intends to continue the Rhum-related activities, consistent with a specific license obtained from OFAC by its customers, and such activities may require additional disclosure pursuant to the abovementioned statute.

Available Information.

We file annual, quarterly and current reports, proxy statements and other information with the SEC. The SEC maintains a website that contains reports, proxy and information statements, and other information regarding issuers, including the Company, that file electronically with the SEC at <https://www.sec.gov>.

General information about us, including our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as any amendments and exhibits to those reports, are available free of charge through our website at <https://investor.ecolab.com> as soon as reasonably practicable after we file them with, or furnish them to, the SEC.

In addition, the following governance materials are available on our web site at <https://investor.ecolab.com/corporate-governance>: (i) charters of the Audit, Compensation, Finance, Governance and Safety, Health and Environment Committees of our Board of Directors; (ii) our Board's Corporate Governance Principles; and (iii) our Code of Conduct.

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Executive Officers.

The persons listed in the following table are our current executive officers. Officers are elected annually. There is no family relationship among any of the directors or executive officers and no executive officer has been involved during the past ten years in any legal proceedings described in applicable Securities and Exchange Commission regulations.

Name	Age	Office	Positions Held Since Jan. 1, 2015
Douglas M. Baker, Jr.	61	Chairman of the Board and Chief Executive Officer	Jan. 2015 – Present
Christophe Beck	52	President and Chief Operating Officer Executive Vice President and President – Industrial Executive Vice President and President – Global Nalco Water Executive Vice President and President – Global Water & Process Services Executive Vice President and President – Regions	Apr. 2019 – Present May 2018 – Mar. 2019 May 2017 – May 2018 May 2015 – May 2017 Jan. 2015 – May 2015
Larry L. Berger	59	Executive Vice President and Chief Technical Officer	Jan. 2015 – Present
Darrell R. Brown	56	Executive Vice President and President – Global Industrial Executive Vice President and President – Energy Services Executive Vice President, Global Downstream & WellChem Executive Vice President and President – Europe	Apr. 2019 – Present Jan. 2018 – Mar. 2019 Apr. 2017 – Dec. 2017 Jan. 2015 – Mar. 2017
Deric D. Bryant	47	Executive Vice President and President – Upstream Energy Executive Vice President and General Manager – Energy Services Oil Field Chemicals Senior Vice President – Energy Services Oil Field Chemicals Vice President Sales – Oil Field Chemicals Latin America CAPX	July 2019 – Present Apr. 2017 – June 2019 Oct. 2016 – Mar. 2017 Jan. 2015 – Sept. 2016
Angela M. Busch	53	Executive Vice President – Corporate & Business Development Senior Vice President – Corporate Development	Aug. 2018 – Present Jan. 2015 – Aug. 2018
Machiel Duijser	48	Executive Vice President and Chief Supply Chain Officer	Feb. 2020 – Present(1)
Roberto Inchaustegui	64	Executive Vice President – Growth Initiatives Executive Vice President and President – Global Services and Specialty	Jan. 2020 – Present Jan. 2015 – Jan. 2020
Scott D. Kirkland	46	Senior Vice President and Corporate Controller Senior Vice President - Finance, Global Energy Services Vice President - Finance Global Institutional Vice President - Finance Institutional North America	June 2019 – Present May 2016 – May 2019 Jan. 2016 – Apr. 2016 Jan. 2015 – Dec. 2015
Laurie M. Marsh	56	Executive Vice President – Human Resources	Jan. 2015 – Present
Michael C. McCormick	57	Executive Vice President, General Counsel and Secretary Executive Vice President, General Counsel and Assistant Secretary Chief Compliance Officer, Deputy General Counsel and Assistant Secretary Chief Compliance Officer and Assistant Secretary	Oct. 2017 – Present Mar. 2017 – Sep. 2017 June 2016 – Feb. 2017 Jan. 2015 – May 2016
Timothy P. Mulhere	57	Executive Vice President and President – Global Institutional & Specialty Services Executive Vice President and President – Regions Executive Vice President and President – Global Water and Process Services	July 2018 – Present May 2015 – June 2018 Jan. 2015 – May 2015
Daniel J. Schmechel	60	Chief Financial Officer Chief Financial Officer and Treasurer Chief Financial Officer	Nov. 2019 – Present Jan. 2017 – Nov. 2019 Jan. 2015 – Dec. 2016

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<u>Name</u>	<u>Age</u>	<u>Office</u>	<u>Positions Held Since Jan. 1, 2015</u>
Elizabeth A. Simermeyer	55	Executive Vice President and President – Global Healthcare and Life Sciences	Dec. 2019 – Present
		Executive Vice President – Global Marketing & Communications and Life Sciences	July 2015 – Dec. 2019
		Senior Vice President – Global Marketing & Communications	Jan. 2015 – July 2015
Jill S. Wyant	48	Executive Vice President and President – Global Regions	Dec. 2019 – Present
		Executive Vice President and President – Global Regions and Global Healthcare	Jan. 2018 – Dec. 2019
		Executive Vice President and President – Global Food & Beverage, Healthcare and Life Sciences	May 2016 – Dec. 2017
		Executive Vice President and President – Global Food & Beverage	Jan. 2015 – Apr. 2016

(1) Prior to joining Ecolab in February 2020, Mr. Duijser was employed by Reckitt Benckiser (RB) Group plc as Chief Supply Officer since November 2018. Mr. Duijser joined RB from Amazon.com, Inc. where he served as Vice President Worldwide Engineering from 2015 to 2018.

Forward-Looking Statements

This Form 10-K, including Part I, Item 1, entitled “Business,” and the MD&A within Part II, Item 7, contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements include expectations concerning items such as:

- amount, funding and timing of cash expenditures relating to our restructuring and other initiatives
- future cash flows, access to capital, targeted credit rating metrics and impact of credit rating downgrade
- adequacy of cash reserves
- uses for cash, including dividends, share repurchases, debt repayments, capital investments and strategic business acquisitions
- global market risk
- impact of oil price fluctuations, comparative performance and prospects of businesses in our Global Energy segment
- long-term potential of our business
- impact of changes in exchange rates and interest rates
- customer retention rate
- bad debt experience, non-performance of counterparties and losses due to concentration of credit risk
- disputes, claims and litigation
- environmental contingencies
- impact and cost of complying with laws and regulations
- sustainability targets
- returns on pension plan assets
- contributions to pension and postretirement healthcare plans
- amortization expense
- impact of new accounting pronouncements
- income taxes, including valuation allowances, loss carryforwards, unrecognized tax benefits, uncertain tax positions and deductibility of goodwill
- recognition of share-based compensation expense
- payments under operating leases
- future benefit plan payments
- market position
- doing business relating to Iran
- the completion and timing of the proposed separation of our Upstream Energy business and subsequent merger with Apergy
- the expected strategic, operational and competitive benefits of the proposed separation of our Upstream Energy business, the effect of the separation on Ecolab and its shareholders, customers and employees
- the impact of the coronavirus outbreak

Without limiting the foregoing, words or phrases such as “will likely result,” “are expected to,” “will be,” “will continue,” “is anticipated,” “we believe,” “we expect,” “estimate,” “project” (including the negative or variations thereof), “intends,” “could,” or similar terminology, generally identify forward-looking statements. Forward-looking statements may also represent challenging goals for us. These statements, which represent the Company’s expectations or beliefs concerning various future events, are based on current expectations that involve a number of risks and uncertainties that could cause actual results to differ materially from those of such forward-looking statements. We caution that undue reliance should not be placed on such forward-looking statements, which speak only as of the date made. For a further discussion of these and other factors which could cause results to differ from those expressed in any forward-looking statement, see Item 1A of this Form 10-K, entitled “Risk Factors.” Except as may be required under applicable law, we undertake no duty to update our forward-looking statements.

Item 1A. Risk Factors.

The following are important factors which could affect our financial performance and could cause our actual results for future periods to differ materially from our anticipated results or other expectations, including those expressed in any forward-looking statements made in this Form 10-K. See the section entitled "Forward-Looking Statements" set forth above.

We may also refer to this disclosure to identify factors that may cause results to differ materially from those expressed in other forward-looking statements including those made in oral presentations, including telephone conferences and/or webcasts open to the public.

Our results depend upon the continued vitality of the markets we serve.

Economic downturns, and in particular downturns in our larger markets including the energy, foodservice, hospitality, travel, health care, food processing, pulp and paper, mining and steel industries, can adversely impact our end-users. The well completion and stimulation, oil and gas production and refinery and petrochemical plant markets served by our Global Energy segment may be impacted by substantial fluctuations in oil and gas prices; in 2015 and 2016, the Global Energy segment experienced decreased sales as a result of very challenging global energy market conditions. In recent years, the weaker global economic environment, particularly in Europe, has also negatively impacted certain of our end-markets. During these periods of weaker economic activity, our customers and potential customers may reduce or discontinue their volume of purchases of cleaning and sanitizing products and water treatment and process chemicals, which has had, and may continue to have, a material adverse effect on our business, financial condition, results of operation or cash flows.

Our results are impacted by general worldwide economic factors.

Economic factors such as the worldwide economy, capital flows, interest rates and currency movements, including, in particular, our exposure to foreign currency risk, have affected our business in the past and may have a material adverse impact on our business in the future. For example, in 2011 and 2012, the European Union's sovereign debt crisis negatively impacted economic activity in that region as well as the strength of the euro versus the U.S. dollar. Additionally, the June 2016 Brexit vote resulted in a sharp decline in the value of the British pound, as compared to the U.S. dollar and other currencies, and has caused increased fluctuations and unpredictability in foreign currency exchange rates. The possibility for referendum by other EU member states may lead to further market volatility. Other regions of the world, including emerging market areas, also expose us to foreign currency risk. As a result of increasing currency controls, importation restrictions, workforce regulations, pricing constraints and local capitalization requirements, we deconsolidated our Venezuelan subsidiaries effective as of the end of the fourth quarter of 2015. Prior to deconsolidation, across the second through fourth quarters of 2015, we devalued our Venezuelan bolivar operations within our Water, Paper, Food & Beverage, Institutional and Energy operating segments. Similar currency devaluations, credit market disruptions or other economic turmoil in other countries could have a material adverse impact on our consolidated results of operations, financial position and cash flows by negatively impacting economic activity, including in our key end-markets, and by further weakening the local currency versus the U.S. dollar, resulting in reduced sales and earnings from our foreign operations, which are generated in the local currency, and then translated to U.S. dollars.

If we are unsuccessful in executing on key business initiatives, including restructurings and our Enterprise Resource Planning ("ERP") system upgrades, our business could be materially and adversely affected.

We continue to execute key business initiatives, including restructurings and investments to develop business systems, as part of our ongoing efforts to improve our efficiency and returns. In particular, we are undertaking the Accelerate 2020 plan to simplify and automate processes and tasks, reduce complexity and management layers, consolidate facilities and focus on key long-term growth areas by leveraging technology and structural improvements as discussed under Note 3 entitled "Special (Gains) and Charges" of this Form 10-K. Additionally, we are continuing our implementation of our ERP system upgrades, which are expected to occur in phases over the next several years. These upgrades, which include supply chain and certain finance functions, are expected to improve the efficiency of certain financial and related transactional processes. These upgrades involve complex business process design and a failure of certain of these processes could result in business disruption. We are also making changes to our system in order to support our separation of the ChampionX business. If the projects in which we are investing or the initiatives which we are pursuing are not successfully executed, our consolidated results of operations, financial position or cash flows could materially and adversely be affected.

We may be subject to information technology system failures, network disruptions and breaches in data security.

We rely to a large extent upon information technology systems and infrastructure to operate our business. The size and complexity of our information technology systems make them potentially vulnerable to failure, malicious intrusion and random attack. Acquisitions have resulted in further de-centralization of systems and additional complexity in our systems infrastructure. Likewise, data security breaches by employees or others with permitted access to our systems may pose a risk that sensitive data may be exposed to unauthorized persons or to the public. While we have invested in protection of data and information technology, there can be no assurance that our efforts will prevent failures, cybersecurity attacks or breaches in our systems that could cause reputational damage, business disruption or legal and regulatory costs; could result in third-party claims; could result in compromise or misappropriation of our intellectual property, trade secrets or sensitive information; or could otherwise adversely affect our business. Certain of our customer offerings include digital components, such as remote monitoring of certain customer operations. A breach of those remote monitoring systems could expose customer data giving rise to potential third-party claims and reputational damage. There may be other related challenges and risks as we complete implementation of our ERP system upgrade.

We are pursuing a plan to separate and combine our Upstream Energy business with Apergy Corporation in a tax-efficient reverse Morris Trust transaction. The proposed transaction may not be completed on the currently contemplated timeline or at all and may not achieve the intended benefits.

We have entered into definitive agreements with ChampionX and Apergy pursuant to which we will separate the Upstream Energy business of our Global Energy segment and combine it with Apergy in a tax-efficient reverse Morris Trust transaction. There can be no assurance of the timing of a transaction with Apergy, or whether any such transaction will take place at all. The transaction is subject to closing conditions, including approval by Apergy's stockholders, approval by certain foreign regulatory authorities and receipt of opinions with respect to the tax-free nature of the proposed transaction, and there can be no assurance that we will receive the required approvals in a timely manner or at all, or that such approvals will not contain adverse conditions. We also have no assurance that we will be able to realize the intended benefits and tax treatment of the transaction or that the new combined company will perform as expected. The announcement and pendency of the transaction could also cause disruptions in our and Apergy's business, including potential adverse reactions or changes to business relationships and competitive responses to the transaction. The transaction will also require significant amounts of time and effort which could divert management's attention from operating and growing our business. In addition, depending on Apergy's stock price at the closing of the transaction, the transaction may result in a book gain or loss to Ecolab. Any such book gain or loss would be reported in Ecolab's financial statements as discontinued operations. Any of the foregoing could materially and adversely affect our business, financial condition and results of operations.

We depend on key personnel to lead our business.

Our continued success will largely depend on our ability to attract, retain and develop a high caliber of talent and on the efforts and abilities of our executive officers and certain other key employees, particularly those with sales and sales management responsibilities to drive business growth, development and profitability. As we continue to grow our business, make acquisitions, expand our geographic scope and offer new products and services, we need the organizational talent necessary to ensure effective succession for executive officer and key employee roles in order to meet the growth, development and profitability goals of our business. Our operations could be materially and adversely affected if for any reason we were unable to attract, retain or develop such officers or key employees.

Our growth depends upon our ability to successfully compete with respect to value, innovation and customer support.

We have numerous global, national, regional and local competitors. Our ability to compete depends in part on providing high quality and high value-added products, technology and service. We must also continue to identify, develop and commercialize innovative, profitable and high value-added products for niche applications and commercial digital applications. We have made significant investments in commercial digital product offerings, and our culture and expertise must continue to evolve to develop, support and profitably deploy commercial digital offerings, which are becoming an increasingly important part of our business. There can be no assurance that we will be able to accomplish our technology development goals or that technological developments by our competitors will not place certain of our products, technology or services at a competitive disadvantage in the future. In addition, certain of the new products that we have under development will be offered in markets in which we do not currently compete, and there can be no assurance that we will be able to compete successfully in those new markets. If we fail to introduce new technologies or commercialize our digital offerings on a timely and profitable basis, we may lose market share and our consolidated results of operations, financial position or cash flows could be materially and adversely affected.

Our significant non-U.S. operations expose us to global economic, political and legal risks that could impact our profitability.

We have significant operations outside the United States, including joint ventures and other alliances. We conduct business in approximately 170 countries and, in 2019, approximately 46% of our net sales originated outside the United States. There are inherent risks in our international operations, including:

- exchange controls and currency restrictions;
- currency fluctuations and devaluations;
- tariffs and trade barriers;
- export duties and quotas;
- changes in the availability and pricing of raw materials, energy and utilities;
- changes in local economic conditions;
- changes in laws and regulations, including the imposition of economic or trade sanctions affecting international commercial transactions;
- impact from Brexit and the possibility of similar events in other EU member states;
- difficulties in managing international operations and the burden of complying with international and foreign laws;
- requirements to include local ownership or management in our business;
- economic and business objectives that differ from those of our joint venture partners;
- exposure to possible expropriation, nationalization or other government actions;
- restrictions on our ability to repatriate dividends from our subsidiaries;
- unsettled political conditions, military action, civil unrest, acts of terrorism, force majeure, war or other armed conflict; and
- countries whose governments have been hostile to U.S.-based businesses.

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Effective January 31, 2020, the U.K. has formally left the European Union. The U.K.'s relationship with the EU will no longer be governed by the EU Treaties, but instead by the terms of the Withdrawal Agreement agreed between the U.K. and the EU in late 2019. The Withdrawal Agreement provides for a "transition" period, which commenced the moment the U.K. left the EU and is currently set to end on December 31, 2020. At the end of the transition period, there may be significant changes to the U.K.'s business environment. While the effects of Brexit will depend on any agreements the U.K. makes to retain access to EU markets or the failure to reach such agreements, the uncertainties created by Brexit, any resolution between the U.K. and EU countries or the failure to reach any such resolutions, could adversely affect our relationships with customers, suppliers and employees and could have a material adverse effect on our business.

In addition, changes in U.S. or foreign government policy on international trade, including the imposition or continuation of tariffs, could materially and adversely affect our business. In 2018, the U.S. imposed tariffs on certain imports from China and other countries, resulting in retaliatory tariffs by China and other countries. While the U.S. and China signed what is being known as the Phase One Deal in January 2020, which included the suspension and rollback of tariffs, any new tariffs imposed by the U.S., China or other countries or any additional retaliatory measures by any of these countries, could increase our costs, reduce our sales and earnings or otherwise have an adverse effect on our operations.

Also, because of uncertainties regarding the interpretation and application of laws and regulations and the enforceability of intellectual property and contract rights, we face risks in some countries that our intellectual property rights and contract rights would not be enforced by local governments. We are also periodically faced with the risk of economic uncertainty, which has impacted our business in some countries. Other risks in international business also include difficulties in staffing and managing local operations, including managing credit risk to local customers and distributors.

Further, our operations outside the United States require us to comply with a number of United States and international regulations, including anti-corruption laws such as the United States Foreign Corrupt Practices Act and the United Kingdom Bribery Act, as well as U.S. and international economic sanctions regulations. We have internal policies and procedures relating to such regulations; however, there is risk that such policies and procedures will not always protect us from the misconduct or reckless acts of employees or representatives, particularly in the case of recently acquired operations that may not have significant training in applicable compliance policies and procedures. Violations of such laws and regulations could result in disruptive investigations of the Company, significant fines and sanctions, which could have a material adverse effect on our consolidated results of operations, financial position or cash flows.

Our overall success as a global business depends, in part, upon our ability to succeed in differing economic, social, legal and political conditions. We may not continue to succeed in developing and implementing policies and strategies that are effective in each location where we do business, which could have a material adverse effect on our consolidated results of operations, financial position or cash flows.

Our results could be materially and adversely affected by difficulties in securing the supply of certain raw materials or by fluctuations in the cost of raw materials.

The prices of raw materials used in our business can fluctuate from time to time, and in recent years we have experienced periods of increased raw material costs. Changes in raw material prices, unavailability of adequate and reasonably priced raw materials or substitutes for those raw materials, or the inability to obtain or renew supply agreements on favorable terms can materially and adversely affect our consolidated results of operations, financial position or cash flows. In addition, volatility and disruption in economic activity and conditions could disrupt or delay the performance of our suppliers and thus impact our ability to obtain raw materials at favorable prices or on favorable terms, which may materially and adversely affect our business.

Consolidation of our customers and vendors could materially and adversely affect our results.

Customers and vendors in the foodservice, hospitality, travel, healthcare, energy, food processing and pulp and paper industries, as well as other industries we serve, have consolidated in recent years and that trend may continue. This consolidation could have a material adverse impact on our ability to retain customers and on our pricing, margins and consolidated results of operations.

Our business depends on our ability to comply with laws and governmental regulations, and we may be materially and adversely affected by changes in laws and regulations.

Our business is subject to numerous laws and regulations relating to the environment, including evolving climate change standards, and to the manufacture, storage, distribution, sale and use of our products as well as to the conduct of our business generally, including employment and labor laws. Compliance with these laws and regulations exposes us to potential financial liability and increases our operating costs. Regulation of our products and operations continues to increase with more stringent standards, causing increased costs of operations and potential for liability if a violation occurs. The potential cost to us relating to environmental and product registration laws and regulations is uncertain due to factors such as the unknown magnitude and type of possible contamination and clean-up costs, the complexity and evolving nature of laws and regulations, and the timing and expense of compliance. Changes to current laws (including tax laws), regulations and policies could impose new restrictions, costs or prohibitions on our current practices which would have a material adverse effect on our consolidated results of operations, financial position or cash flows. Changes to labor and employment laws and regulations, as well as related rulings by courts and administrative bodies, could materially and adversely affect our operations and expose us to potential financial liability.

Subsidiaries of ChampionX are defendants in pending lawsuits alleging negligence and injury resulting from the use of COREXIT™ dispersant in response to the Deepwater Horizon oil spill, which could expose these subsidiaries to monetary damages or settlement costs.

As described in Part II, Item 8, Note 15, “Commitments and Contingencies,” of this Form 10-K, certain entities that are or will become subsidiaries of ChampionX upon completion of the transactions to separate and combine our Upstream Energy business with Apergy Corporation (collectively the “COREXIT Defendants”) are among the defendants in a number of class action and individual plaintiff lawsuits arising from the use of COREXIT™ dispersant in response to the Deepwater Horizon oil spill, which could expose the COREXIT Defendants to monetary damages or settlement costs. The plaintiffs in these matters have claimed damages under products liability, tort and other theories.

There currently remain three cases pending against the COREXIT Defendants. It is expected that they will be dismissed pursuant to a November 28, 2012 order granting the COREXIT Defendants’ motion for summary judgment. ChampionX cannot predict whether there will be an appeal of the dismissal, the involvement the COREXIT Defendants might have in these matters in the future or the potential for future litigation. However, although ChampionX believes it has rights to contribution and/or indemnification from third parties in connection with these lawsuits if an appeal by plaintiffs in these lawsuits is brought and won, these suits could have a material adverse effect on the business of ChampionX and its financial condition, results of operations or cash flows.

The COREXIT Defendants continue to sell the COREXIT™ oil dispersant product and previously sold product remains in the inventories of individual customers and oil spill response organizations. ChampionX cannot predict the potential for future litigation with respect to such sales or inventory. However, if one or more of such lawsuits are brought and won, these suits could have a material adverse impact on the combined company’s financial results.

We enter into multi-year contracts with customers that could impact our results.

Our multi-year contracts with some of our customers include terms affecting our pricing flexibility. There can be no assurance that these restraints will not have a material adverse impact on our margins and consolidated results of operations.

If we are unsuccessful in integrating acquisitions, our business could be materially and adversely affected.

As part of our long-term strategy, we seek to acquire complementary businesses. There can be no assurance that we will find attractive acquisition candidates or succeed at effectively managing the integration of acquired businesses into existing businesses. If the underlying business performance of such acquired businesses deteriorates, the expected synergies from such transactions do not materialize or we fail to successfully integrate new businesses into our existing businesses, our consolidated results of operations, financial position or cash flows could be materially and adversely affected.

Changes in tax laws and unanticipated tax liabilities could materially and adversely affect the taxes we pay and our profitability.

We are subject to income and other taxes in the United States and foreign jurisdictions, and our operations, plans and results are affected by tax and other initiatives around the world. In particular, we are affected by the impact of changes to tax laws or related authoritative interpretations in the United States, including tax reform under the 2017 Tax Cuts and Jobs Act (the “Tax Act”), which includes broad and complex changes to the United States tax code, and the state tax response to the Tax Act, including, but not limited to variability in our future tax rate. We are also subject to changes in tax law outside the United States. In addition, we are impacted by settlements of pending or any future adjustments proposed by the IRS or other taxing authorities in connection with our tax audits, all of which will depend on their timing, nature and scope. Increases in income tax rates, changes in income tax laws (including regulations which interpret the Tax Act) or unfavorable resolution of tax matters could have a material adverse impact on our financial results.

Future events may impact our deferred tax position, including the utilization of foreign tax credits and undistributed earnings of international affiliates that are considered to be reinvested indefinitely.

We evaluate the recoverability of deferred tax assets and the need for deferred tax liabilities based on available evidence. This process involves significant management judgment about assumptions that are subject to change from period to period based on changes in tax laws or variances between future projected operating performance and actual results. We are required to establish a valuation allowance for deferred tax assets if we determine, based on available evidence at the time the determination is made, that it is more likely than not that some portion or all of the deferred tax assets will not be realized. In making this determination, we evaluate all positive and negative evidence as of the end of each reporting period. Future adjustments (either increases or decreases), to the deferred tax asset valuation allowance are determined based upon changes in the expected realization of the net deferred tax assets. The realization of the deferred tax assets ultimately depends on the existence of sufficient taxable income in either the carry-back or carry-forward periods under the tax law. Due to significant estimates used to establish the valuation allowance and the potential for changes in facts and circumstances, it is reasonably possible that we will be required to record adjustments to the valuation allowance in future reporting periods. Changes to the valuation allowance or the amount of deferred tax liabilities could have a material adverse effect on our consolidated results of operations or financial position. Further, should we change our assertion regarding the permanent reinvestment of the undistributed earnings of international affiliates, a deferred tax liability may need to be established.

Our indebtedness may limit our operations and our use of our cash flow, and any failure to comply with the covenants that apply to our indebtedness could materially and adversely affect our liquidity and financial statements.

As of December 31, 2019, we had approximately \$6.3 billion in outstanding indebtedness, with approximately \$80 million in the form of floating rate debt. Our debt level and related debt service obligations may have negative consequences, including:

- requiring us to dedicate significant cash flow from operations to the payment of principal and interest on our debt, which reduces the funds we have available for other purposes such as acquisitions and capital investment;
- reducing our flexibility in planning for or reacting to changes in our business and market conditions;
- exposing us to interest rate risk since a portion of our debt obligations are at variable rates. For example, a one percentage point increase in the average interest rate on our floating rate debt at December 31, 2019 would increase future interest expense by approximately \$1 million per year; and
- increasing our cost of funds and materially and adversely affecting our liquidity and access to the capital markets should we fail to maintain the credit ratings assigned to us by independent rating agencies.

If we add new debt, the risks described above could increase.

Severe public health outbreaks may materially and adversely impact our business.

Our business could be adversely affected by the effect of a public health epidemic. The United States and other countries have experienced, and may experience in the future, public health outbreaks such as coronavirus, Zika virus, Avian Flu, SARS and H1N1 influenza. A prolonged occurrence of a contagious disease such as these could result in a significant downturn in the foodservice, hospitality and travel industries and also may result in health or other government authorities imposing restrictions on travel further impacting our end markets. Any of these events could result in a significant drop in demand for some of our products and services and materially and adversely affect our business. Uncertainty with respect to the impact on our financial results of the coronavirus outbreak is discussed further in Management Discussion & Analysis located at Part II, Item 7, of this form 10-K under the heading “Global Economic and Political Environment.”

We incur significant expenses related to the amortization of intangible assets and may be required to report losses resulting from the impairment of goodwill or other assets recorded in connection with the Nalco and Champion transactions and other acquisitions.

We expect to continue to complete selected acquisitions and joint venture transactions in the future. In connection with acquisition and joint venture transactions, applicable accounting rules generally require the tangible and intangible assets of the acquired business to be recorded on the balance sheet of the acquiring company at their fair values. Intangible assets other than goodwill are required to be amortized over their estimated useful lives and this expense may be significant. Any excess in the purchase price paid by the acquiring company over the fair value of tangible and intangible assets of the acquired business is recorded as goodwill. If it is later determined that the anticipated future cash flows from the acquired business may be less than the carrying values of the assets and goodwill of the acquired business, the assets or goodwill may be deemed to be impaired. In this case, the acquiring company may be required under applicable accounting rules to write down the value of the assets or goodwill on its balance sheet to reflect the extent of the impairment. This write-down of assets or goodwill is generally recognized as a non-cash expense in the statement of operations of the acquiring company for the accounting period during which the write down occurs. As of December 31, 2019, we had goodwill of \$7.3 billion which is maintained in various reporting units, including goodwill from the Nalco and Champion transactions. If we determine that any of the assets or goodwill recorded in connection with the Nalco and Champion transactions or any other prior or future acquisitions or joint venture transactions have become impaired, we will be required to record a loss resulting from the impairment. Impairment losses could be significant and could have a material adverse effect on our consolidated results of operations and financial position.

A chemical spill or release could materially and adversely impact our business.

As a manufacturer and supplier of chemical products, there is a potential for chemicals to be accidentally spilled, released or discharged, either in liquid or gaseous form, during production, transportation, storage or use. Such a release could result in environmental contamination as well as a human or animal health hazard. Accordingly, such a release could have a material adverse effect on our consolidated results of operations, financial position or cash flows.

Extraordinary events may significantly impact our business.

The occurrence of (a) litigation or claims, (b) the loss or insolvency of a major customer or distributor, (c) repeated or prolonged federal government shutdowns or similar events, (d) war (including acts of terrorism or hostilities which impact our markets), (e) natural or manmade disasters, (f) water shortages or (g) severe weather conditions affecting our operations or the energy, foodservice, hospitality and travel industries may have a material adverse effect on our business.

Defense of litigation, particularly certain types of actions such as antitrust, patent infringement, personal injury, product liability, wage hour and class action lawsuits, can be costly and time consuming even if ultimately successful, and if not successful could have a material adverse effect on our consolidated results of operations, financial position or cash flows.

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While we have a diverse customer base and no customer or distributor constitutes 10 percent or more of our consolidated revenues, we do have customers and independent, third-party distributors, the loss of which could have a material adverse effect on our consolidated results of operations or cash flows for the affected earnings periods.

Federal government shutdowns can have a material adverse effect on our consolidated results of operations or cash flows by disrupting or delaying new product launches, renewals of registrations for existing products and receipt of import or export licenses for raw materials or products.

War (including acts of terrorism or hostilities), natural or manmade disasters, water shortages or severe weather conditions affecting the energy, foodservice, hospitality, travel, health care, food processing, pulp and paper, mining, steel and other industries can cause a downturn in the business of our customers, which in turn can have a material adverse effect on our consolidated results of operations, financial position or cash flows. In particular, the U.S. Gulf Coast is a region with significant refining, petrochemicals and chemicals operations which provide us raw materials, as well as being an important customer base for our Energy and Water operating segments. Hurricanes or other severe weather events impacting the Gulf Coast could materially and adversely affect our ability to obtain raw materials at reasonable cost, or at all, and could adversely affect our business with our customers in the region.

[Item 1B. Unresolved Staff Comments.](#)

We have no unresolved comments from the staff of the Securities and Exchange Commission.

[Item 2. Properties.](#)

Our manufacturing philosophy is to manufacture products wherever an economic, process or quality assurance advantage exists or where proprietary manufacturing techniques dictate in-house production. Currently, most products that we sell are manufactured at our facilities. We position our manufacturing locations and warehouses in a manner to permit ready access to our customers.

Our manufacturing facilities produce chemical products as well as medical devices and equipment for all of our operating segments, although Pest Elimination purchases the majority of their products and equipment from outside suppliers. Our chemical production process consists of blending purchased raw materials into finished products in powder, liquid, and solid form. Additionally, intermediates from reaction chemistries are used in some of the blends and are also packaged directly into finished goods. Our devices and equipment manufacturing operations consist of producing chemical product dispensers and injectors and other mechanical equipment, medical devices, dishwasher racks, related sundries, dish machine refurbishment and water monitoring and maintenance equipment system from purchased components and subassemblies.

The following table profiles our more significant physical properties with approximately 70,000 square feet or more with ongoing production activities, as well as certain other facilities important in terms of specialization and sources of supply. In general, manufacturing facilities located in the United States serve our U.S. markets and facilities located outside of the United States serve our international markets. However, most of the United States facilities do manufacture products for export.

PLANT PROFILES

Location	Approximate Size (Sq. Ft.)	Segment	Owned or Leased
Joliet, IL USA	610,000	Global Institutional, Global Industrial	Owned
Tai Cang, CHINA	468,000	Global Institutional, Global Industrial	Owned
Odessa, TX USA	435,000	Global Energy	Owned
Sainghin, FRANCE	360,000	Global Institutional, Global Industrial	Owned
Sugar Land, TX USA	350,000	Global Energy, Global Industrial	Owned
South Beloit, IL USA	313,000	Global Institutional, Global Industrial, Other	Owned
Jianghai, CHINA	296,000	Global Energy, Global Industrial	Owned
Chalons, FRANCE	280,000	Global Institutional, Global Industrial	Owned
Soledad, COLUMBIA	276,000	Global Energy	Owned
Clearing, IL USA	270,000	Global Energy, Global Industrial	Owned
Jurong Island, SINGAPORE	250,000	Global Energy, Global Industrial	Owned
Nanjing, CHINA	240,000	Global Energy, Global Industrial	Owned
Garland, TX USA	239,000	Global Institutional, Global Industrial	Owned
Martinsburg, WV USA	228,000	Global Institutional, Global Industrial	Owned
Elwood City, PA USA	222,000	Global Energy, Global Industrial	Owned
Weavergate, UNITED KINGDOM	222,000	Global Industrial, Global Institutional	Owned
Celra, SPAIN	218,000	Global Institutional, Global Industrial	Owned
Greensboro, NC USA	193,000	Global Institutional	Owned
Fresno, TX USA	192,000	Global Energy	Owned
Freeport, TX USA	189,000	Global Energy	Owned

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Location	Approximate Size (Sq. Ft.)	Segment	Ownership Owned or Leased
Las Americas, DOMINICAN REPUBLIC	182,000	Global Institutional	Owned
Jacksonville, FL USA	181,000	Global Institutional	Leased
Garyville, LA USA	178,000	Global Energy, Global Industrial	Owned
Nieuwegein, NETHERLANDS	168,000	Global Institutional, Global Industrial	Owned
La Romana, DOMINICAN REPUBLIC	160,000	Global Institutional	Leased
Tessenderlo, BELGIUM	153,000	Global Institutional	Owned
Cheltenham, AUSTRALIA	145,000	Global Institutional, Global Industrial	Owned
Suzano, BRAZIL	142,000	Global Energy, Global Industrial	Owned
McDonough, GA USA	141,000	Global Institutional, Global Industrial	Owned
Darra, AUSTRALIA	138,000	Global Institutional, Global Industrial	Owned
Corsicana, TX USA	137,000	Global Energy	Owned
Burlington, ON CANADA	136,000	Global Energy, Global Industrial	Owned
Eagan, MN USA	133,000	Global Institutional, Global Industrial, Other	Owned
Huntington, IN USA	127,000	Global Institutional, Global Industrial	Owned
Rozzano, ITALY	126,000	Global Institutional, Global Industrial	Owned
City of Industry, CA USA	125,000	Global Institutional, Global Industrial	Owned
Mississauga, ON CANADA	120,000	Global Institutional, Global Industrial	Leased
Aberdeen, UNITED KINGDOM	118,000	Global Energy	Owned
Elk Grove Village, IL USA	115,000	Global Institutional	Leased
Biebesheim, GERMANY	109,000	Global Energy, Global Industrial	Owned
Fort Worth, TX USA	101,000	Global Institutional	Leased
Johannesburg, SOUTH AFRICA	100,000	Global Institutional, Global Industrial	Owned
Hamilton, NEW ZEALAND	96,000	Global Institutional, Global Industrial	Owned
Calgary, AB CANADA	94,000	Global Energy	Owned
Kwinana, AUSTRALIA	87,000	Global Institutional, Global Industrial	Owned
Yangsan, KOREA	85,000	Global Energy, Global Industrial	Owned
Cisterna, ITALY	80,000	Global Industrial	Owned
Cuautitlan, MEXICO	76,000	Global Institutional, Global Industrial	Owned
Barueri, BRAZIL	75,000	Global Institutional, Global Industrial	Leased
Mullingar, IRELAND	74,000	Global Institutional, Global Industrial	Leased
Mosta, MALTA	73,000	Global Institutional	Leased
Noviciado, CHILE	70,000	Global Industrial, Global Institutional	Owned
Navanakorn, THAILAND	67,000	Global Institutional, Global Industrial	Leased
Aubagne, FRANCE	65,000	Global Institutional	Leased
Rovigo, ITALY	60,000	Global Institutional	Owned
Siegsdorf, GERMANY	56,000	Global Institutional, Global Industrial	Owned
Verona, ITALY	55,000	Global Institutional	Owned
Guangzhou, CHINA	55,000	Global Institutional, Global Industrial	Owned
Lerma, MEXICO	49,000	Global Industrial	Owned
Maribor, SLOVENIA	46,400	Global Institutional, Global Industrial	Owned
Leeds, UNITED KINGDOM	25,000	Global Institutional	Owned
Baglan, UNITED KINGDOM	24,400	Global Institutional	Leased
Noda, JAPAN	22,000	Global Institutional, Global Industrial	Owned
Steritimak, RUSSIA	20,000	Global Energy, Global Industrial	Owned

Generally, our manufacturing facilities are adequate to meet our existing in-house production needs. We continue to invest in our plant sites to maintain viable operations and to add capacity as necessary to meet business imperatives.

Most of our manufacturing plants also serve as distribution centers. In addition, we operate distribution centers around the world, most of which are leased, and utilize third party logistics service providers to facilitate the distribution of our products and services.

Our corporate headquarters is comprised of a six-story building and a 17-story building that we own in St. Paul, Minnesota. We also own a 90-acre campus in Eagan, Minnesota that houses a significant research and development center, a data center and training facilities as well as several of our administrative functions.

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We also have a significant business presence in Naperville, Illinois, where our Water and Paper operating segments maintain their principal administrative offices and research center, as well as in Greensboro, North Carolina, where our Specialty operating segment maintains its principal administrative offices and a research center. Our Energy operating segment maintains Company-owned administrative and research facilities in Sugar Land, Texas and additional research facilities in Fresno, Texas.

Significant regional administrative and/or research facilities are located in Campinas, Brazil; Leiden, Netherlands; and Pune, India, which we own, and in Dubai, UAE; Lille, France; Miramar, Florida; Monheim, Germany; Singapore, Shanghai, China; and Zurich, Switzerland; which we lease. We also have a network of small leased sales offices in the United States and, to a lesser extent, in other parts of the world.

Item 3. Legal Proceedings.

Discussion of legal proceedings is incorporated by reference from Part II, Item 8, Note 15, "Commitments and Contingencies," of this Form 10-K and should be considered an integral part of Part I, Item 3, "Legal Proceedings."

Discussion of other environmental-related legal proceedings is incorporated by reference from Part I, Item 1 above, under the heading "Environmental and Regulatory Considerations."

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information

Our common stock is listed on the New York Stock Exchange under the symbol "ECL." Our common stock is also traded on an unlisted basis on certain other United States exchanges.

Holdings

On January 31, 2020, we had 5,698 holders of record of our Common Stock.

Issuer Purchases of Equity Securities

Period	Total number of shares purchased (1)	Average price paid per share (2)	Total number of shares purchased as part of publicly announced plans or programs (3)	Maximum number of shares that may yet be purchased under the plans or programs (3)
October 1-31, 2019	-	\$-	-	6,820,810
November 1-30, 2019	2,833	192.0670	-	6,820,810
December 1-31, 2019	24,260	188.7098	15,800	6,805,010
Total	27,093	\$189.0609	15,800	6,805,010

- (1) Includes 11,293 shares reacquired from employees and/or directors to satisfy the exercise price of stock options or shares surrendered to satisfy statutory tax obligations under our stock incentive plans.
- (2) The average price paid per share includes brokerage commissions associated with publicly announced plan purchases plus the value of such other reacquired shares.
- (3) As announced on February 24, 2015, our Board of Directors authorized the repurchase of up to 20,000,000 shares. Subject to market conditions, we expect to repurchase all shares under these authorizations, for which no expiration date has been established, in open market or privately negotiated transactions, including pursuant to Rule 10b5-1 and accelerated share repurchase program.

Item 6. Selected Financial Data.

(millions, except per share amounts)	2019 ⁽¹⁾	2018 ⁽²⁾	2017 ⁽³⁾	2016 ⁽⁴⁾	2015 ⁽⁵⁾
Year ended December 31:					
Net sales	\$14,906.3	\$14,668.2	\$13,835.9	\$13,151.8	\$13,545.1
Operating income	2,013.8	1,947.0	1,950.1	1,870.2	1,561.3
Net income attributable to Ecolab	1,558.9	1,429.1	1,504.6	1,229.0	1,002.1
Basic earnings per share	5.41	4.95	5.20	4.20	3.38
Diluted earnings per share, as reported (U.S. GAAP)	5.33	4.88	5.12	4.14	3.32
Cash dividends declared per common share	1.85	1.69	1.52	1.42	1.34
Diluted earnings per share, as reported (U.S. GAAP)					
Adjustments:	\$5.33	\$4.88	\$5.12	\$4.14	\$3.32
Special (gains) and charges	0.69	0.35	0.19	0.21	1.25
Discrete tax expense (benefits)	(0.20)	0.02	(0.63)	0.01	(0.21)
Adjusted diluted earnings per share (Non-GAAP)	\$5.82	\$5.25	\$4.68	\$4.37	\$4.37
At December 31:					
Total assets	\$20,869.1	\$20,074.5	\$19,963.5	\$18,331.1	\$18,641.7
Long-term debt (excluding portions due within one year)	5,973.5	6,301.6	6,758.3	6,145.7	4,260.2

Selected financial data for 2015 is not presented on a comparable basis due to the adoption of ASU 2014-09, *Revenue from Contracts with Customers*. Per share amounts do not necessarily sum due to rounding.

(1) Special (gains) and charges for 2019 include the following charges net of tax, net restructuring charges of \$106.6 million, ChampionX separation charges of \$71.5 million, acquisition and integration charges of \$9.9 million and litigation and other charges of \$7.5 million.

Discrete tax expense (benefits) for 2019 include benefits associated with stock compensation excess tax benefits of \$43.1 million, favorable adjustments to the estimate for U.S. tax reform one-time repatriation tax benefit of \$3.1 million and other tax net benefits of \$12.5 million.

(2) Special (gains) and charges for 2018 include the following charges net of tax, a commitment to the Ecolab Foundation of \$18.9 million, net restructuring charges of \$77.2 million, acquisition and integration charges of \$5.7 million and litigation and other charges of \$1.0 million.

Discrete tax expense (benefits) for 2018 include adjustments to the estimate for U.S. tax reform one-time repatriation tax expense of \$66.0 million, benefits associated with stock compensation excess tax benefits of \$28.1 million, a favorable adjustment related to changes in estimates and an IRS approved method change in the Company's filed U.S. federal tax returns of \$39.9 million and other tax expense of \$6.7 million.

(3) Special (gains) and charges for 2017 include the following charges net of tax, acquisition and integration charges of \$18.5 million, net restructuring charges of \$32.4 million, charges related to a Global Energy vendor contract termination of \$14.4 million and charges on extinguished debt of \$13.6 million. Gains, net of tax, include gain on sale of Equipment Care of \$12.4 million, tax benefits on the repatriation of cash to the U.S. of \$7.8 million and a net gain of \$2.7 million from other activity.

Discrete tax expense (benefits) for 2017 include a net benefit of \$158.9 million for repricing of U.S. deferred tax positions to the U.S. tax reform rate, offset by a one-time repatriation tax on foreign earnings and stock compensation excess tax benefits of \$39.6 million. Expenses include recognizing adjustments from filing our 2016 U.S. federal income tax return and release of uncertain tax positions totaling \$14.3 million.

(4) Special (gains) and charges for 2016 include net of tax, charges of \$50.0 million associated with the downturn in the global energy market and litigation related charges of \$26.4 million. Gains, net of tax, include a net gain for restructuring and a net gain for other activity of \$3.2 million.

Discrete tax expense (benefits) for 2016 include net expense of \$3.9 million driven primarily from adjustments to deferred tax asset and liability positions, recognizing adjustments from filing our 2015 U.S. federal income tax return, tax charges related to optimizing our business structure and settlement of international tax matters offset by benefits driven primarily by the release of reserves for uncertain tax positions due to expiration of statute of limitations in non-U.S. jurisdictions, settlement of international tax matters, remeasurements of certain deferred tax assets and liabilities resulting from the application of an updated tax rate in an international jurisdiction and valuation allowance releases.

(5) Special (gains) and charges for 2015 include the following charges net of tax, Venezuelan charges of \$235.7 million, restructuring charges of \$75.5 million, charges of \$38.3 million related to litigation related charges, a loss on the sale of a portion of our Ecovation business and the net impact of inventory reserve and inventory cost policy harmonization efforts, fixed asset impairment of \$15.4 million and integration costs of \$12.0 million.

Discrete tax expense (benefits) for 2015 include net benefits of \$63.3 million driven primarily from our ability to recognize a worthless stock deduction for the tax basis in a wholly owned domestic subsidiary, release of valuation allowances on certain deferred tax assets and a refund claim for taxes paid in a prior period resulting from updated IRS regulations, finalization of prior year IRS audits and other statute of limitation tax reserve releases offset by a change to a deferred tax liability resulting from the Naperville facility transaction.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The following management discussion and analysis ("MD&A") provides information that we believe is useful in understanding our operating results, cash flows and financial condition. We provide quantitative information about the material sales drivers including the impact of changes in volume and pricing and the effect of acquisitions and changes in foreign currency at the corporate and reportable segment level. We also provide quantitative information regarding special (gains) and charges, discrete tax items and other significant factors we believe are useful for understanding our results. Such quantitative drivers are supported by comments meant to be qualitative in nature. Qualitative factors are generally ordered based on estimated significance.

The discussion should be read in conjunction with the consolidated financial statements and related notes included in this Form 10-K. Our consolidated financial statements are prepared in accordance with U.S. GAAP. This discussion contains various Non-GAAP Financial Measures and also contains various forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. We refer readers to the statements and information set forth in the sections entitled "Non-GAAP Financial Measures" at the end of this MD&A, and "Forward-Looking Statements" and "Risk Factors" within Items 1 and 1A of this Form 10-K. We also refer readers to the tables within the section entitled "Results of Operations" of this MD&A for reconciliation information of Non-GAAP measures to U.S. GAAP.

Comparability of Results

Fixed Currency Foreign Exchange Rates

Management evaluates the sales and operating income performance of our non-U.S. dollar functional currency international operations based on fixed currency exchange rates, which eliminate the impact of exchange rate fluctuations on our international operations. Fixed currency amounts are updated annually at the beginning of each year based on translation into U.S. dollars at foreign currency exchange rates established by management, with all periods presented using such rates. Public currency rate data provided within the "Segment Performance" section of this MD&A reflect amounts translated at actual public average rates of exchange prevailing during the corresponding period and is provided for informational purposes only.

Comparability of Reportable Segments

We made immaterial changes to our reportable segments, including the movement of certain customers and cost allocations between reportable segments. All comparisons and discussion throughout the MD&A reflect these changes.

Impact of Acquisitions and Divestitures

Acquisition adjusted growth rates exclude the results of our acquired businesses from the first twelve months post acquisition and exclude the results of our divested businesses from the twelve months prior to divestiture.

EXECUTIVE SUMMARY

We achieved improved sales and strong earnings growth in 2019 as we drove new product introductions, new business wins and improved operating efficiency in a generally steady market environment. Increased pricing was achieved to more than offset unfavorable sales mix. Along with higher other income and lower interest expense, adjusted diluted earnings per share leveraged the good operating income growth and delivered the year's double-digit adjusted diluted EPS growth.

Sales

Reported sales increased 2% to \$14.9 billion in 2019 from \$14.7 billion in 2018. Sales were positively impacted by pricing. When measured in fixed rates of foreign currency exchange, fixed currency sales increased 4% compared to the prior year. Acquisition adjusted fixed currency sales increased 3% compared to the prior year.

Gross Margin

Our reported gross margin was 41.5% of sales for 2019, compared to our 2018 reported gross margin of 41.2%. Excluding the impact of special (gains) and charges included in cost of sales from both 2019 and 2018, our adjusted gross margin was 41.7% in 2019 and 41.3% in 2018.

Operating Income

Reported operating income increased 3% to \$2.01 billion in 2019, compared to \$1.95 billion in 2018. Adjusted operating income, excluding the impact of special (gains) and charges, increased 9% in 2019. When measured in fixed rates of foreign currency exchange, adjusted fixed currency operating income increased 11% in 2019.

Earnings Attributable to Ecolab Per Common Share ("EPS")

Reported diluted EPS increased 9% to \$5.33 in 2019 compared to \$4.88 in 2018. Special (gains) and charges had an impact on both years. Special (gains) and charges in 2019 were driven primarily by the impact of restructuring charges, the ChampionX separation charges, discrete tax items, acquisition and integration charges, litigation and other charges. Special (gains) and charges in 2018 were driven primarily by the impact of restructuring charges and our commitment to the Ecolab Foundation. Special (gains) and charges in 2017 were driven primarily by the impact of income tax reform, restructuring charges, other discrete taxes, acquisition and integration charges and the gain on sale of Equipment Care. Adjusted diluted EPS, which exclude the impact of special (gains) and charges and discrete tax items increased 11% to \$5.82 in 2019 compared to \$5.25 in 2018.

Balance Sheet

We remain committed to maintaining "A" range ratings metrics, supported by our current credit ratings of A-/Baa1/A- by Standard & Poor's, Moody's Investor Services and Fitch. Our strong balance sheet has allowed us continued access to capital at attractive rates.

Net Debt to EBITDA

Our net debt to earnings before interest, taxes, depreciation and amortization ("EBITDA") was 2.0 and 2.3 for 2019 and 2018, respectively. We view these ratios as important indicators of the operational and financial health of our organization. See the "Net Debt to EBITDA" table on page 43 for reconciliation information.

Cash Flow

Cash flow from operating activities was \$2.4 billion in 2019 compared to \$2.3 billion in 2018. We continued to generate strong cash flow from operations, allowing us to fund our ongoing operations, acquisitions, investments in our business, debt repayments, pension obligations and return cash to our shareholders through share repurchases and dividend payments.

Dividends

We increased our quarterly cash dividend 2% in December 2019 to an indicated annual rate of \$1.88 per share. The increase represents our 28th consecutive annual dividend rate increase and the 83rd consecutive year we have paid cash dividends. Our outstanding dividend history reflects our continued growth and development, strong cash flows, solid financial position and confidence in our business prospects for the years ahead.

CRITICAL ACCOUNTING ESTIMATES

Our consolidated financial statements are prepared in accordance with U.S. GAAP. We have adopted various accounting policies to prepare the consolidated financial statements in accordance with U.S. GAAP. Our significant accounting policies are disclosed in Note 2 of the Notes to the Consolidated Financial Statements ("Notes").

Preparation of our consolidated financial statements, in conformity with U.S. GAAP, requires us to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Estimates are considered to be critical if they meet both of the following criteria: (1) the estimate requires assumptions to be made about matters that are highly uncertain at the time the accounting estimate is made, and (2) different estimates that we reasonably could have used for the accounting estimate in the current period, or changes in the accounting estimate that are reasonably likely to occur from period to period, have a material impact on the presentation of our financial condition or results of operations.

Besides estimates that meet the "critical" estimate criteria, we make many other accounting estimates in preparing our financial statements and related disclosures. All estimates, whether or not deemed critical, affect reported amounts of assets, liabilities, revenues or expenses as well as disclosures of contingent assets and liabilities. Estimates are based on experience and other information available prior to the issuance of the financial statements. Materially different results can occur as circumstances change and additional information becomes known, even from estimates not deemed critical. Our critical accounting estimates include the following:

Revenue Recognition

Revenue is measured as the amount of consideration expected to be received in exchange for transferring goods or providing service. Revenue from product and sold equipment is recognized when obligations under the terms of a contract with the customer are satisfied, which generally occurs with the transfer of the product or delivery of the equipment. Revenue from service and leased equipment is recognized when the services are provided, or the customer receives the benefit from the leased equipment, which is over time. Service revenue is recognized over time utilizing an input method and aligns with when the services are provided. Typically, revenue is recognized over time using costs incurred to date because the effort provided by the field selling and service organization represents services provided, which corresponds with the transfer of control. Revenue for leased equipment is accounted for under Topic 842 Leases and recognized on a straight-line basis over the length of the lease contract.

Our revenue policies do not provide for general rights of return. We record estimated reductions to revenue for customer programs and incentive offerings including pricing arrangements, promotions and other volume-based incentives based primarily on historical experience and anticipated performance over the contract period. Depending on market conditions, we may increase customer incentive offerings, which could reduce gross profit margins over the term of the incentive. We also record estimated reserves for product returns and credits based on specific circumstances and credit conditions, and when it is deemed probable that the balance is uncollectible. For additional information on our allowance for doubtful accounts, see discussion below.

The revenue standard can be applied to a portfolio of contracts with similar characteristics if it is reasonable that the effects of applying the standard at the portfolio would not be significantly different than applying the standard at the individual contract level. We apply the portfolio approach primarily within each operating segment by geographical region. Application of the portfolio approach was focused on those characteristics that have the most significant accounting consequences in terms of their effect on the timing of revenue recognition or the amount of revenue recognized. We determined the key criteria to assess with respect to the portfolio approach, including the related deliverables, the characteristics of the customers and the timing and transfer of goods and services, which most closely aligned within the operating segments. In addition, the accountability for the business operations, as well as the operational decisions on how to go to market and the product offerings, are performed at the operating segment level. For additional information on revenue recognition, see Note 17.

Valuation Allowances and Accrued Liabilities

Allowances for Doubtful Accounts

We estimate our allowance for doubtful accounts by analyzing accounts receivable balances by age and applying historical write-off and collection trend rates. In addition, our estimates also include separately providing for customer receivables based on specific circumstances and credit conditions, and when it is deemed probable the balance is uncollectible. We estimate our sales returns and allowances by analyzing historical returns and credits and apply these trend rates to calculate estimated reserves for future credits. Actual results could differ from these estimates.

Our allowance for doubtful accounts balance was \$62 million and \$61 million, as of December 31, 2019 and 2018, respectively. These amounts include our allowance for sales returns and credits of \$18 million and \$17 million as of December 31, 2019 and 2018, respectively. Our bad debt expense as a percent of reported net sales was 0.1% in each of the years 2019, 2018 and 2017. We believe it is reasonably likely that future results will be consistent with historical trends and experience. However, if the financial condition of our customers were to deteriorate, resulting in an inability to make payments, or if unexpected events, economic downturns, or significant changes in future trends were to occur, additional allowances may be required. For additional information on our allowance for doubtful accounts, see Note 2.

Accrued Liabilities

Our business and operations are subject to extensive environmental laws and regulations governing, among other things, air emissions, wastewater discharges, the use and handling of hazardous substances, waste disposal and the investigation and remediation of soil and groundwater contamination. Some risk of environmental liability is inherent in our operations.

We record liabilities related to pending litigation, environmental claims and other contingencies when a loss is probable and can be reasonably estimated. Estimates used to record such liabilities are based on our best estimate of probable future costs. We record the amounts that represent the points in the range of estimates that we believe are most probable or the minimum amount when no amount within the range is a better estimate than any other amount. Potential insurance reimbursements generally are not anticipated in our accruals for environmental liabilities or other insured losses. Expected insurance proceeds are recorded as receivables when recovery is deemed certain. While the final resolution of litigation and environmental contingencies could result in amounts different than current accruals, and therefore have an impact on our consolidated financial results in a future reporting period, we believe the ultimate outcome will not have a significant impact on our consolidated financial position. For additional information on our commitments and contingencies, see Note 15.

Actuarially Determined Liabilities

Pension and Postretirement Healthcare Benefit Plans

The measurement of our pension and postretirement benefit obligations are dependent on a variety of assumptions determined by management and used by our actuaries. These assumptions affect the amount and timing of future contributions and expenses.

The significant assumptions used in developing the required estimates are the discount rate, expected return on assets, projected salary and health care cost increases and mortality table.

- The discount rate assumptions for our U.S. plans are assessed using a yield curve constructed from a subset of bonds yielding greater than the median return from a population of non-callable, corporate bond issues that have an average rating of AA when averaging available Moody's Investor Services, Standard & Poor's and Fitch ratings. The discount rate is calculated by matching the plans' projected cash flows to the bond yield curve. For 2019 and 2018, we elected to measure service and interest costs by applying the specific spot rates along that yield curve to the plans' liability cash flows. We believe this approach provides a more precise measurement of service and interest costs by aligning the timing of the plans' liability cash flows to the corresponding spot rates on the yield curve. In determining our U.S. pension obligations for 2019, our weighted-average discount rate decreased to 3.20% from 4.34% at year-end 2018. In determining our U.S. postretirement health care obligation for 2019, our weighted-average discount rate decreased to 3.16% from 4.29% at year-end 2018.
- The expected rate of return on plan assets reflects asset allocations, investment strategies and views of investment advisors, and represents our expected long-term return on plan assets. Our weighted-average expected return on U.S. plan assets used in determining the U.S. pension and U.S. postretirement health care expenses was 7.25% for 2020 and 2019 and 7.75% for 2018.
- Projected salary and health care cost increases are based on our long-term actual experience, the near-term outlook and assumed inflation. Our weighted-average projected salary increase used in determining the U.S. pension expenses was 4.03% for 2019, 2018 and 2017.
- For postretirement benefit measurement purposes as of December 31, 2019, the annual rates of increase in the per capita cost of covered health care were assumed to be 8.00% for pre-65 costs and 10.75% for post-65 costs. The rates are assumed to decrease each year until they reach 5% in 2028 and remain at those levels thereafter.
- In determining our U.S. pension and U.S. postretirement health care obligation for 2019, we utilized the most recent mortality table, MP-2019 projection scale (applied to the Pri-2012 mortality table).

The effects of actual results differing from our assumptions, as well as changes in assumptions, are reflected in the unrecognized actuarial loss and amortized over future periods and, therefore, will generally affect our recognized expense in future periods. Significant differences in actual experience or significant changes in assumptions may materially affect future pension and other postretirement obligations. The unrecognized net actuarial loss on our U.S. qualified and non-qualified pension plans increased to \$632 million as of December 31, 2019 from \$539 million as of December 31, 2018 (both before tax), primarily due to current year net actuarial losses.

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The effect of a decrease in the discount rate or decrease in the expected return on assets assumption as of December 31, 2019, on the December 31, 2019 defined benefit obligation and 2020 expense is shown below, assuming no changes in benefit levels and no amortization of gains or losses for our significant U.S. plans. Expense amounts reflect the accounting for actuarial gains as a component of other comprehensive income and recognition of the impacts into income over the remaining service period:

(millions)	Effect on U.S. Pension Plans		
	Assumption Change	Increase in Recorded Obligation	Higher 2020 Expense
Discount rate	-0.25 pts	\$74.1	\$5.3
Expected return on assets	-0.25 pts	N/A	5.3

(millions)	Effect on U.S. Postretirement Health Care Benefits Plans		
	Assumption Change	Increase in Recorded Obligation	Higher 2020 Expense
Discount rate	-0.25 pts	\$4.1	\$0.2
Expected return on assets	-0.25 pts	N/A	-

Our international pension obligations and underlying plan assets represent approximately one third of our global pension plans, with the majority of the amounts held in the U.K. and Eurozone countries. We use assumptions similar to our U.S. plan assumptions to measure our international pension obligations, however, the assumptions used vary by country based on specific local country requirements and information.

See Note 16 for further discussion concerning our accounting policies, estimates, funded status, contributions and overall financial positions of our pension and postretirement plan obligations.

Self-Insurance

Globally we have insurance policies with varying deductible levels for property and casualty losses. We are insured for losses in excess of these deductibles, subject to policy terms and conditions and have recorded both a liability and an offsetting receivable for amounts in excess of these deductibles. We are self-insured for health care claims for eligible participating employees, subject to certain deductibles and limitations. We determine our liabilities for claims on an actuarial basis.

Restructuring

Our restructuring activities are associated with plans to enhance our efficiency, effectiveness and sharpen the competitiveness of our businesses. These restructuring plans include net costs associated with significant actions involving employee-related severance charges, contract termination costs and asset write-downs and disposals. Employee termination costs are largely based on policies and severance plans, and include personnel reductions and related costs for severance, benefits and outplacement services. These charges are reflected in the quarter in which the actions are probable and the amounts are estimable, which typically is when management approves the associated actions. Contract termination costs include charges to terminate leases prior to the end of their respective terms and other contract termination costs. Asset write-downs and disposals include leasehold improvement write-downs, other asset write-downs associated with combining operations and disposal of assets.

Restructuring charges have been included as a component of cost of sales and special (gains) and charges on the Consolidated Statement of Income. Amounts included as a component of cost of sales include supply chain related severance and other asset write-downs associated with combining operations. Restructuring liabilities have been classified as a component of both other current and other noncurrent liabilities on the Consolidated Balance Sheet. Our restructuring liability balance was \$112 million and \$79 million as of December 31, 2019 and 2018, respectively. For additional information on our restructuring activities, see Note 3.

Income Taxes

Judgment is required to determine the annual effective income tax rate, deferred tax assets and liabilities, valuation allowances recorded against net deferred tax assets and uncertain tax positions.

On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Act") was enacted, which reduces the U.S. federal corporate tax rate from 35% to 21%, required companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and created new taxes on certain foreign sourced earnings. The Tax Act added many new provisions including changes to bonus depreciation, the deduction for executive compensation and interest expense, a tax on global intangible low taxed income (GILTI), the base erosion anti abuse tax (BEAT) and a deduction for foreign derived intangible income (FDII).

We recorded an estimate of the one-time transition tax in the fourth quarter of 2017 of \$160 million and in 2018 and 2019 we recorded additional discrete expense of \$66 million and benefit of \$3.1 million, respectively, primarily due to the issuance of technical guidance in both years, the finalization of certain estimates as a result of filing the 2017 and 2018 U.S. federal tax return and the finalization of the balance sheet positions used in the calculation of the transition tax. We have completed our accounting for the effects of the Tax Act as they relate to the repricing of deferred tax balances and the one-time transition tax.

Additionally, proposed regulations were released during 2019. Certain of the proposed regulations may be subject to challenge; therefore, we recorded tax expense based on our interpretation of the changes in law affected by the Tax Act and not the proposed regulations. If the proposed regulations become final, we will record the impact at that time.

Effective Income Tax Rate

Our effective income tax rate is based on annual income, statutory tax rates and tax planning available in the various jurisdictions in which we operate. Our annual effective income tax rate includes the impact of reserve provisions. We recognize the largest amount of tax benefit that is greater than 50% likely of being realized upon settlement with a taxing authority. We adjust these reserves in light of changing facts and circumstances. This expected annual rate is then applied to our year-to-date operating results. In the event there is a significant discrete item recognized in our interim operating results, the tax attributable to that item would be separately calculated and recorded in the same period.

Tax regulations require items to be included in our tax returns at different times than the items are reflected in our financial statements. As a result, the effective income tax rate reflected in our financial statements differs from that reported in our tax returns. Some of these differences are permanent, such as expenses that are not deductible on our tax return, and some are temporary differences, such as depreciation expense.

Deferred Tax Assets and Liabilities and Valuation Allowances

Temporary differences create deferred tax assets and liabilities. Deferred tax assets generally represent items that can be used as a tax deduction or credit in our tax return in future years for which we have already recorded the tax benefit in our income statement. We establish valuation allowances for our deferred tax assets when the amount of expected future taxable income is not likely to support the utilization of the entire deduction or credit. Relevant factors in determining the realizability of deferred tax assets include historical results, future taxable income, the expected timing of the reversal of temporary differences, tax planning strategies and the expiration dates of the various tax attributes. Deferred tax liabilities generally represent items for which we have already taken a deduction in our tax return but have not yet recognized that tax benefit in our financial statements.

During 2019, due to the adoption of the new lease standard and the recording of operating lease assets and operating lease liabilities on the Consolidated Balance Sheet, we recorded related deferred tax liabilities and deferred tax assets, respectively.

Uncertain Tax Positions

A number of years may elapse before a particular tax matter, for which we have established a reserve, is audited and finally resolved. The number of tax years with open tax audits varies depending on the tax jurisdiction. The Internal Revenue Service ("IRS") has completed its examinations of our U.S. federal income tax returns through 2016 and the years 2017 and 2018 are currently under audit. In addition to the U.S. federal examinations, we have ongoing audit activity in several U.S. state and foreign jurisdictions.

The tax positions we take are based on our interpretations of tax laws and regulations in the applicable federal, state and international jurisdictions. We believe our tax returns properly reflect the tax consequences of our operations, and our reserves for tax contingencies are appropriate and sufficient for the positions taken. Because of the uncertainty of the final outcome of these examinations, we have reserved for potential reductions of tax benefits (including related interest and penalties) for amounts that do not meet the more-likely-than-not thresholds for recognition and measurement as required by authoritative guidance. The tax reserves are reviewed throughout the year, taking into account new legislation, regulations, case law and audit results. Settlement of any particular issue could result in offsets to other balance sheet accounts, cash payments or receipts and/or adjustments to tax expense. Tax reserves are presented in the Consolidated Balance Sheet within other non-current liabilities. Our gross liability for uncertain tax positions was \$28 million and \$50 million as of December 31, 2019 and 2018, respectively. For additional information on income taxes see Note 12.

Long-Lived Assets, Intangible Assets and Goodwill

Long-Lived and Amortizable Intangible Assets

We review our long-lived and amortizable intangible assets, the net value of which was \$7.0 billion and \$7.1 billion as of December 31, 2019 and 2018, respectively, for impairment and when significant events or changes in business circumstances indicate that the carrying value of the assets may not be recoverable. Such circumstances may include a significant decrease in the market price of an asset, a significant adverse change in the manner in which the asset is being used or in its physical condition or history of operating or cash flow losses associated with the use of the asset. Impairment losses could occur when the carrying amount of an asset exceeds the anticipated future undiscounted cash flows expected to result from the use of the asset and its eventual disposition. The amount of the impairment loss to be recorded, if any, is calculated as the excess of the asset's carrying value over its estimated fair value.

We use the straight-line method to recognize amortization expense related to our amortizable intangible assets, including our customer relationships. We consider various factors when determining the appropriate method of amortization for our customer relationships, including projected sales data, customer attrition rates and length of key customer relationships.

Globally, we have a broad customer base. Our retention rate of significant customers has aligned with our acquisition assumptions, including the customer bases acquired from our Nalco and Champion transactions, which make up the majority of our unamortized customer relationships. Our historical retention rate, coupled with our consistent track record of keeping long-term relationships with our customers, supports our expectation of consistent sales generation for the foreseeable future from the acquired customer base. If our customer retention rate or other post-acquisition operational activities changed materially, we would evaluate the financial impact and any corresponding triggers which could result in an acceleration of amortization or impairment of our customer relationship intangible assets.

In addition, we periodically reassess the estimated remaining useful lives of our long-lived and amortizable intangible assets. Changes to estimated useful lives would impact the amount of depreciation and amortization expense recorded in earnings. We have experienced no significant changes in the carrying value or estimated remaining useful lives of our long-lived or amortizable intangible assets.

Goodwill and Indefinite Life Intangible Assets

We had total goodwill of \$7.3 billion and \$7.1 billion as of December 31, 2019 and 2018, respectively. We test our goodwill for impairment at the reporting unit level on an annual basis during the second quarter. Our reporting units are aligned with our eleven operating segments.

For our 2019 impairment assessment, we completed our assessment for goodwill impairment across our reporting units using a two-step quantitative analysis, utilizing a discounted cash flow approach. The first step of the analysis involved determining the estimated fair value of each reporting unit and comparing them to the respective carrying values, including goodwill. If the fair value of a reporting unit exceeds its carrying value, goodwill of the reporting unit is considered not to be impaired, and the second step of the impairment test is unnecessary. If the carrying amount of the reporting unit exceeds its fair value, the second step of the goodwill impairment test would be performed to measure the amount of impairment loss to be recorded, if any. Our goodwill impairment assessment for 2019 indicated the estimated fair value of each of our reporting units exceeded the unit's carrying amount by a significant margin. We assess the need to test our reporting units for impairment during interim periods between our scheduled annual assessments when significant events or changes in business circumstances indicate that the carrying value of the reporting unit may not be recoverable. There has been no impairment of goodwill in any of the years presented.

As part of the Nalco merger, we added the "Nalco" trade name as an indefinite life intangible asset, the total value of which was \$1.2 billion as of December 31, 2019 and 2018. The carrying value of the indefinite life trade name was subject to annual impairment testing, using a relief from royalty assessment method, during the second quarter of 2019. Our Nalco trade name assessment for 2019 indicated the estimated fair value of the asset exceeded its carrying amount by a significant margin. We assess the need to test the Nalco trade name for impairment during interim periods between our scheduled annual assessments when significant events or changes in business circumstances indicate that the carrying value of the asset may not be recoverable. There has been no impairment of the Nalco trade name in any of the years presented.

RESULTS OF OPERATIONS

Net Sales

(millions)	Percent Change				
	2019	2018	2017	2019	2018
Product and equipment sales	\$12,238.9	\$12,128.6	\$11,431.8		
Service and lease sales	2,667.4	2,539.6	2,404.1		
Reported GAAP net sales	\$14,906.3	\$14,668.2	\$13,835.9	2 %	6 %
Effect of foreign currency translation	140.6	(137.5)	(37.8)		
Non-GAAP fixed currency sales	\$15,046.9	\$14,530.7	\$13,798.1	4 %	5 %

The percentage components of the year-over-year sales change are shown below:

(percent)	2019	2018
Volume	0%	4%
Price changes	2	2
Acquisition adjusted fixed currency sales change	3	6
Acquisitions & divestitures	1	0
Fixed currency sales change	4	6
Foreign currency translation	(2)	0
Reported GAAP net sales change	2%	6%

Amounts do not necessarily sum due to rounding.

Cost of Sales ("COS") and Gross Profit Margin ("Gross Margin")

(millions/percent)	2019		2018		2017	
	COS	Gross Margin	COS	Gross Margin	COS	Gross Margin
Product and equipment cost of sales	\$7,106.4		\$7,078.5		\$6,576.9	
Service and lease cost of sales	1,617.0		1,547.4		1,487.3	
Reported GAAP COS and gross margin	\$8,723.4	41.5 %	\$8,625.9	41.2 %	\$8,064.2	41.7 %
Special (gains) and charges	38.5	0.2	9.3	0.1	44.0	0.3
Non-GAAP adjusted COS and gross margin	\$8,684.9	41.7 %	\$8,616.6	41.3 %	\$8,020.2	42.0 %

Our COS values and corresponding gross margin are shown in the previous table. Our gross margin is defined as sales less cost of sales divided by sales.

Our reported gross margin was 41.5%, 41.2%, and 41.7% for 2019, 2018, and 2017, respectively. Our 2019, 2018 and 2017 reported gross margins were negatively impacted by special (gains) and charges of \$38.5 million, \$9.3 million, and \$44.0 million, respectively. Special (gains) and charges items impacting COS are shown within the "Special (Gains) and Charges" table on page 33.

Excluding the impact of special (gains) and charges, our 2019 adjusted gross margin was 41.7% compared against a 2018 adjusted gross margin of 41.3%. The increase was driven primarily by pricing, which more than offset unfavorable sales mix.

Excluding the impact of special (gains) and charges, our adjusted gross margin was 41.3% and 42.0% for 2018 and 2017, respectively. The decrease was driven primarily by higher delivered product costs more than offsetting the impact from increased pricing and cost savings.

Selling, General and Administrative Expenses ("SG&A")

(percent)	2019	2018	2017
SG&A Ratio	26.5 %	27.1 %	27.6 %

The decreased SG&A ratio (SG&A expenses as a percentage of reported net sales) comparing 2019 against 2018 and comparing 2018 against 2017 were driven primarily by sales leverage, restructuring efforts and cost savings, which more than offset investments in the business.

Special (Gains) and Charges

Special (gains) and charges reported on the Consolidated Statement of Income included the following items:

(millions)	2019	2018	2017
Cost of sales			
Restructuring activities	\$20.4	\$12.1	\$4.6
Acquisition and integration activities	7.6	(0.6)	13.2
Other	10.5	(2.2)	26.2
Cost of sales subtotal	38.5	9.3	44.0
Special (gains) and charges			
Restructuring activities	116.8	89.4	39.9
ChampionX separation	77.3	-	-
Acquisition and integration activities	5.6	8.8	15.4
Gain on sale of business	-	-	(46.1)
Venezuela related gain	-	-	(11.5)
Other	11.9	28.5	(1.4)
Special (gains) and charges subtotal	211.6	126.7	(3.7)
Operating income subtotal	250.1	136.0	40.3
Interest expense, net	0.2	0.3	21.9
Other (income) expense	9.5	-	-
Total special (gains) and charges	\$259.8	\$136.3	\$62.2

For segment reporting purposes, special (gains) and charges are not allocated to reportable segments, which is consistent with our internal management reporting.

Restructuring Activities

Restructuring activities are primarily related to Accelerate 2020 (described below). These activities have been included as a component of cost of sales, special (gains) and charges, and other (income) expense on the Consolidated Statement of Income. Restructuring liabilities have been classified as a component of other current and other noncurrent liabilities on the Consolidated Balance Sheet.

Further details related to our restructuring charges are included in Note 3.

Accelerate 2020

During the third quarter of 2018, we formally commenced a restructuring plan Accelerate 2020 (“the Plan”), to leverage technology and system investments and organizational changes. In 2019, we raised our goals for the Plan to further simplify and automate processes and tasks, reduce complexity and management layers, consolidated facilitates and focus on key long-term growth areas by further leveraging technology and structural improvements. We expect that the restructuring activities will be completed by the end of 2020, with total anticipated costs of \$260 million (\$200 million after tax), or an estimated \$0.68 per diluted share, over this period of time. Costs are expected to be primarily cash expenditures for severance costs and some facility closure costs relating to team reorganizations. Actual costs may vary from these estimates depending on actions taken.

We recorded restructuring charges of \$136.6 million (\$104.4 million after tax) or \$0.36 per diluted share in 2019. Of these expenses, \$2.0 million (\$1.5 million after tax) or less than \$0.01 per diluted share is recorded in other (income) expense. The liability related to the Plan was \$104.0 million as of the end of the year. We have recorded \$241.2 million (\$184.0 million after tax), or \$0.63 per diluted share, of cumulative restructuring charges under the Plan. The majority of the pretax charges represent net cash expenditures which are expected to be paid over a period of a few months to several quarters which continue to be funded from operating activities.

The Plan has delivered \$125 million of cumulative cost savings with estimated annual cost savings of \$325 million by 2021.

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Other Restructuring Activities

During 2019, we incurred restructuring charges of \$4.1 million (\$3.3 million after tax), or \$0.01 per diluted share, related to an immaterial restructuring plan. The charges are comprised of severance, facility closure costs, including asset disposals, and consulting fees.

Prior to 2018, we engaged in a number of restructuring plans. During 2017, we commenced restructuring and other cost-saving actions in order to streamline operations. These actions include a reduction of our global workforce, as well as asset disposals and lease terminations. Actions were substantially completed in 2017. We also have restructuring plans that commenced prior to 2016. During 2019, net restructuring gains related to prior year plans were \$1.5 million (\$1.1 million after tax) or less than \$0.01 per diluted share. During 2018, net restructuring gains related to prior year plans were \$3.1 million (\$2.4 million after tax) or \$0.01 per diluted share. The gains recorded were due to finalizing estimates upon completion of projects. During 2017, we recorded restructuring charges of \$44.5 million (\$32.3 million after tax) or \$0.11 per diluted share.

The restructuring liability balance for all plans excluding Accelerate 2020 was \$7.7 million and \$14.9 million as of December 31, 2019 and 2018, respectively. The reduction in liability was driven primarily by severance payments. The remaining liability is expected to be paid over a period of a few months to several quarters and will continue to be funded from operating activities. Cash payments during 2019 related to these plans were \$8.3 million.

ChampionX Separation

On December 18, 2019, we entered into definitive agreements with ChampionX and Apergy pursuant to which we will separate the Upstream Energy business of our Global Energy segment and combine it with Apergy in a tax-efficient reverse Morris Trust transaction. During 2019, the charges associated with the separation reported in special (gains) and charges on the Consolidated Statement of Income include \$77.3 million (\$65.8 million after tax) or \$0.22 per diluted share. The charges are primarily related to professional fees to support the separation. ChampionX separation costs reported in other (income) expense on the Consolidated Statement of Income in 2019 include \$7.5 million (\$5.7 million after tax) or \$0.02 per diluted share related to pension curtailments and settlements due to the separation.

Acquisition and integration related costs

Acquisition and integration costs reported in special (gains) and charges on the Consolidated Statement of Income in 2019 include \$5.6 million (\$4.1 million after tax) or \$0.01 per diluted share. Charges are primarily related to Bioquell PLC ("Bioquell") and Laboratoires Anios ("Anios") acquisitions and consist of integration costs, advisory and legal fees. Acquisition and integration costs reported in product and equipment cost of sales on the Consolidated Statement of Income in 2019 include \$7.6 million (\$5.6 million after tax) or \$0.02 per diluted share and are related to recognition of fair value step-up in the Bioquell inventory and facility closure costs. In conjunction with our acquisitions, we incurred \$0.2 million (\$0.1 million after tax), or less than \$0.01 per diluted share, of interest expense in 2019.

During 2018, acquisition and integration costs reported in special (gains) and charges on the Consolidated Statement of Income included \$8.8 million (\$6.1 million after tax), or \$0.02 per diluted share, of charges primarily related to Anios integration costs, advisory and legal fees. The acquisition and integration gains reported in cost of sales on the Consolidated Statement of Income in 2018 related to changes in estimates related to an early lease exist. In conjunction with our acquisitions, we incurred \$0.3 million (\$0.2 million after tax), or less than \$0.01 per diluted share, of interest expense in 2018.

During 2017, acquisition and integration costs reported in special (gains) and charges on the Consolidated Statement of Income included \$15.4 million (\$9.9 million after tax), or \$0.03 per diluted share, of acquisition costs, advisory and legal fees, and integration charges for the Anios and Swisher acquisitions. Acquisition and integration costs reported in cost of sales on the Consolidated Statement of Income in 2017 included \$13.2 million (\$8.6 million after tax), or \$0.03 per diluted share, which related primarily to disposal of excess inventory upon the closure of Swisher plants, accelerated rent expense, and amounts related to recognition of fair value step-up in the Anios inventory. Further information related to our acquisitions is included in Note 4.

Gain on sale of business

During 2017, we disposed of the Equipment Care business and recorded a gain of \$46.1 million (\$12.4 million after tax primarily due to non-deductible goodwill), or \$0.04 per diluted share, net of working capital adjustments, costs to sell and other transaction expenses. The gain was included as a component of special (gains) and charges on the Consolidated Statement of Income.

Venezuela related activities

Effective as of the end of the fourth quarter of 2015, we deconsolidated our Venezuelan subsidiaries. We recorded gains due to U.S. dollar cash recoveries of intercompany receivables written off at the time of deconsolidation of \$11.5 million (\$7.2 million after tax) or \$0.02 per diluted share in 2017. No such gains occurred in 2018 and 2019.

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Other

During 2019, we recorded other special charges of \$11.9 million (\$7.5 million after tax), or \$0.03 per diluted share, which primarily related to legal charges partially offset by a litigation settlement. Other special charges reported in product and equipment cost of sales on the Consolidated Statement of Income in 2019 of \$10.5 million (\$7.1 million after tax), or \$0.02 per diluted share, relate to a Healthcare product recall in Europe.

During 2018, we recorded other special charges of \$28.5 million (\$21.5 million after tax), or \$0.07 per diluted share, which primarily consisted of a \$25.0 million (\$18.9 million after tax), or \$0.06 per diluted share, commitment to the Ecolab Foundation. Other charges, primarily litigation related charges, were minimal and have been included as a component of special (gains) and charges on the Consolidated Statement of Income. Other special gains reported in product and equipment cost of sales on the Consolidated Statement of Income in 2018 of \$2.2 million (\$1.7 million after tax), or \$0.01 per diluted share, relate to changes in estimates for an inventory LIFO reserve.

During 2017, we recorded other charges of \$24.8 million (\$19.0 million after tax), or \$0.06 per diluted share, primarily related to fixed asset impairments, a Global Energy vendor contract termination and litigation related charges. These charges have been included as a component of both cost of sales and special (gains) and charges on the Consolidated Statement of Income.

Other (Income) Expense

During 2019, the Company recorded other expense of \$9.5 million (\$7.2 million after tax) or \$0.02 per diluted share related to pension curtailments and settlements for ChampionX separation and Accelerate 2020, respectively, as discussed further above. These charges have been included as a component of other (income) expense on the Consolidated Statement of Income.

Interest expense, net

During 2019 and 2018, an immaterial amount of interest expense was recorded due to acquisition and integration costs.

During 2017, in anticipation of U.S. tax reform and a potential limit on interest deductibility in future years, we entered into transactions to exchange or retire certain long-term debt, and incurred debt exchange and extinguishment charges of \$21.9 million (\$13.6 million after tax) or \$0.05 per diluted share. This charge has been included as a component of interest expense, net on the Consolidated Statement of Income.

Operating Income and Operating Income Margin

	Percent Change				
(millions)	2019	2018	2017	2019	2018
Reported GAAP operating income	\$2,013.8	\$1,947.0	\$1,950.1	3 %	(0)%
Special (gains) and charges	250.1	136.0	40.3		
Non-GAAP adjusted operating income	2,263.9	2,083.0	1,990.4	9	5
Effect of foreign currency translation	20.4	(20.4)	(12.1)		
Non-GAAP adjusted fixed currency operating income	\$2,284.3	\$2,062.6	\$1,978.3	11 %	4 %
(percent)	2019	2018	2017		
Reported GAAP operating income margin	13.5 %	13.3 %	14.1 %		
Non-GAAP adjusted operating income margin	15.2 %	14.2 %	14.4 %		
Non-GAAP adjusted fixed currency operating income margin	15.2 %	14.2 %	14.3 %		

Our operating income and corresponding operating income margin are shown in the previous tables. Operating income margin is defined as operating income divided by sales.

Our reported operating income increased 3% when comparing 2019 to 2018 and was flat when comparing 2018 to 2017. Our reported operating income for 2019, 2018 and 2017 was impacted by special (gains) and charges. Excluding the impact of special (gains) and charges from all three years, 2019 adjusted operating income increased 9% when compared to 2018 adjusted operating income and 2018 adjusted operating income increased 5% when compared to 2017 adjusted operating income.

As shown in the previous table, foreign currency translation had a minimal impact on adjusted operating income growth for 2019 and 2018.

Other (Income) Expense

(millions)	2019	2018	2017
Reported GAAP other (income) expense	\$(76.3)	\$(79.9)	\$(67.3)
Special (gains) and charges	9.5	-	-
Non-GAAP adjusted other (income) expense	\$(85.8)	\$(79.9)	\$(67.3)

Our reported other income was \$76.3 million, \$79.9 million and \$67.3 million in 2019, 2018, and 2017, respectively. Excluding the impact of pension curtailments and settlements in 2019, our adjusted other income was \$85.8 million reflecting the return on pension assets and non-service costs of our pension obligations.

Interest Expense, Net

(millions)	2019	2018	2017
Reported GAAP interest expense, net	\$191.2	\$222.3	\$255.0
Special (gains) and charges	0.2	0.3	21.9
Non-GAAP adjusted interest expense, net	\$191.0	\$222.0	\$233.1

Our reported net interest expense totaled \$191.2 million, \$222.3 million and \$255.0 million during 2019, 2018 and 2017 respectively.

We incurred \$0.2 million (\$0.1 million after tax), or less than \$0.01 per diluted share and \$0.3 million (\$0.2 million after tax), or less than \$0.01 per diluted share, of interest expense in conjunction with our acquisitions during 2019 and 2018, respectively.

During 2017, in anticipation of U.S. tax reform and a potential limit on interest deductibility in future years, we entered into transactions to exchange or retire certain long-term debt, and incurred debt exchange and extinguishment charges of \$21.9 million (\$13.6 million after tax) or \$0.05 per diluted share.

The decrease in our 2019 adjusted net interest expense compared to 2018 was driven primarily by lower outstanding debt and higher interest income. The decrease in our 2018 adjusted net interest expense compared to 2017 was driven primarily by lower interest rates on debt.

Provision for Income Taxes

The following table provides a summary of our tax rate:

(percent)	2019	2018	2017
Reported GAAP tax rate	17.0 %	20.2 %	13.8 %
Tax rate impact of:			
The Tax Act	0.1	(3.4)	8.7
Special (gains) and charges	0.6	0.3	(0.1)
Discrete tax items	2.6	3.2	1.4
Non-GAAP adjusted tax rate	20.3 %	20.3 %	23.8 %

Our reported tax rate was 17.0%, 20.2%, and 13.8% for 2019, 2018 and 2017, respectively. The change in our tax rate includes the tax impact of special (gains) and charges and discrete tax items, which have impacted the comparability of our historical reported tax rates, as amounts included in our special (gains) and charges are derived from tax jurisdictions with rates that vary from our tax rate, and discrete tax items are not necessarily consistent across periods. The tax impact of special (gains) and charges and discrete tax items will likely continue to impact comparability of our reported tax rate in the future. The enactment of the Tax Act also significantly impacted the comparability of our reported tax rate.

We recognized total net benefit related to discrete tax items of \$58.4 million during 2019. Share-based compensation excess tax benefit contributed \$43.1 million in 2019. The extent of excess tax benefits is subject to variation in stock price and stock option exercises. We recognized \$15.6 million tax benefit related to changes in local tax law, which primarily includes \$30.4 million benefit due to the passage of the Swiss Tax Reform and AHV Financing Act, a Swiss federal tax law, offset by a tax expense of \$10.2 million due to the release of the final Treasury Regulation governing taxation of foreign dividends. We recorded changes in reserves in non-U.S. and U.S. jurisdictions due to audit settlements and statutes of limitations which resulted in a \$16.8 million tax benefit. We finalized the 2015 and 2016 IRS audit, which also resulted in discrete tax expense of \$11.0 million. The remaining discrete tax expense was primarily related to changes in estimates in non-U.S. jurisdictions.

We recognized total net expense related to discrete tax items of \$4.7 million during 2018. In the third quarter of 2018, we filed U.S. federal tax returns which resulted in favorable adjustments of \$39.9 million related to changes in estimates and an IRS approved method change. U.S. tax reform (as described further below) resulted in \$66.0 million expense for 2018. Share-based compensation excess tax benefit contributed \$28.1 million in 2018. The extent of excess tax benefits is subject to variation in stock price and stock option exercises. Included within the 2018 provision for income taxes in \$44.2 million of discrete charges recorded in the fourth quarter to correct immaterial errors in prior years. The remaining discrete tax expense was primarily related to changes in reserves in non-U.S. jurisdictions, audit settlements and both international and U.S. changes in estimates.

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On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Act") was enacted, which reduced the U.S. federal corporate tax rate from 35% to 21%, required companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and created new taxes on certain foreign sourced earnings. The Tax Act added many new provisions including changes to bonus depreciation, the deduction for executive compensation and interest expense, a tax on global intangible low taxed income (GILTI), the base erosion anti abuse tax (BEAT) and a deduction for foreign derived intangible income (FDII). In January 2018, accounting guidance was issued requiring a company to make an accounting policy election to either treat taxes due on future U.S. inclusions in taxable income related to GILTI as a current-period expense when incurred (the "period cost method") or factor such amounts into a company's measurement of our deferred taxes (the "deferred method"). We have elected the period cost method and included the GILTI impact in our tax expense.

We initially recorded an estimate of the one-time transition tax in the fourth quarter of 2017 of \$160.1 million and in 2018 we recorded additional discrete expense of \$66.0 million associated with finalizing our accounting for the Tax Act, primarily due to the issuance of technical guidance during the year and finalization of estimates related to asset balances and calculation of foreign earnings and profits. Our 2017 reported rate also includes a \$319.0 million tax benefit for recording deferred tax assets and liabilities at the U.S. enacted tax rate of 21%. Our 2017 reported tax rate also includes the tax impact of special (gains) and charges, as well as additional tax benefits utilized in anticipation of U.S. tax reform of \$7.8 million. During 2017, we also recorded a discrete tax benefit of \$39.7 million related to excess tax benefits. In addition, we recorded net discrete expenses of \$14.4 million related to recognizing adjustments from filing our 2016 U.S. federal income tax return and international adjustments due to changes in estimates, partially offset by the release of reserves for uncertain tax positions due to the expiration of statute of limitations in state tax matters.

The adjusted rate was 20.3% for both 2019 and 2018. The change in our adjusted tax rate from 2018 to 2017 was primarily driven by enactment of the Tax Act, global tax planning projects and geographic income mix. Future comparability of our adjusted tax rate may be impacted by various factors, including but not limited to, the Tax Act, other changes in global tax rules, further tax planning projects and geographic income mix.

Net Income Attributable to Ecolab

	Percent Change				
(millions)	2019	2018	2017	2019	2018
Reported GAAP net income attributable to Ecolab	\$1,558.9	\$1,429.1	\$1,504.6	9 %	(5)%
Adjustments:					
Special (gains) and charges, after tax	202.6	102.8	56.0		
Discrete tax net expense (benefit)	(58.4)	4.7	(184.2)		
Non-GAAP adjusted net income attributable to Ecolab	\$1,703.1	\$1,536.6	\$1,376.4	11 %	12 %

Diluted EPS

	Percent Change				
(dollars)	2019	2018	2017	2019	2018
Reported GAAP diluted EPS	\$ 5.33	\$ 4.88	\$ 5.12	9 %	(5)%
Adjustments:					
Special (gains) and charges	0.69	0.35	0.19		
Discrete tax net expense (benefit)	(0.20)	0.02	(0.63)		
Non-GAAP adjusted diluted EPS	\$ 5.82	\$ 5.25	\$ 4.68	11 %	12 %

Per share amounts do not necessarily sum due to rounding.

Currency translation had an unfavorable \$0.13 impact on reported and adjusted diluted EPS when comparing 2019 to 2018 and minimal impact when comparing 2018 to 2017.

SEGMENT PERFORMANCE

The non-U.S. dollar functional currency international amounts included within our reportable segments are based on translation into U.S. dollars at the fixed currency exchange rates established by management for 2019. The difference between the fixed currency exchange rates and the actual currency exchange rates is reported as "effect of foreign currency translation" in the following tables. All other accounting policies of the reportable segments are consistent with U.S. GAAP and the accounting policies described in Note 2. Additional information about our reportable segments is included in Note 18.

Fixed currency net sales and operating income for 2019, 2018 and 2017 for our reportable segments are shown in the following tables.

	Percent Change				
	2019	2018	2017	2019	2018
(millions)					
Global Industrial	\$5,569.9	\$5,220.2	\$4,895.8	7 %	7 %
Global Institutional	5,235.5	5,066.0	4,785.8	3	6
Global Energy	3,334.0	3,388.8	3,205.8	(2)	6
Other	907.5	855.7	910.7	6	(6)
Subtotal at fixed currency	15,046.9	14,530.7	13,798.1	4	5
Effect of foreign currency translation	(140.6)	137.5	37.8		
Total reported net sales	\$14,906.3	\$14,668.2	\$13,835.9	2 %	6 %

	Percent Change				
	2019	2018	2017	2019	2018
(millions)					
Global Industrial	\$854.7	\$724.4	\$722.0	18 %	0 %
Global Institutional	1,042.2	1,007.3	962.7	3	5
Global Energy	379.1	338.5	322.9	12	5
Other	167.3	160.0	140.7	5	14
Corporate	(409.1)	(303.6)	(210.3)		
Subtotal at fixed currency	2,034.2	1,926.6	1,938.0	6	(1)
Effect of foreign currency translation	(20.4)	20.4	12.1		
Total reported operating income	\$2,013.8	\$1,947.0	\$1,950.1	3 %	0%

The following tables reconcile the impact of acquisitions and divestitures within our reportable segments.

	Year ended December 31					
	2019			2018		
	Fixed Currency	Impact of Acquisitions and Divestitures	Acquisition Adjusted	Fixed Currency	Impact of Acquisitions and Divestitures	Acquisition Adjusted
(millions)						
Global Industrial	\$5,569.9	\$(103.3)	\$5,466.6	\$5,220.2	\$(11.9)	\$5,208.3
Global Institutional	5,235.5	(35.4)	5,200.1	5,066.0	-	5,066.0
Global Energy	3,334.0	(0.1)	3,333.9	3,388.8	(2.5)	3,386.3
Other	907.5	(1.6)	905.9	855.7	(0.3)	855.4
Subtotal at fixed currency	15,046.9	(140.4)	14,906.5	14,530.7	(14.7)	14,516.0
Effect of foreign currency translation	(140.6)			137.5		
Total reported net sales	\$14,906.3			\$14,668.2		

	Year ended December 31					
	2019			2018		
	Fixed Currency	Impact of Acquisitions and Divestitures	Acquisition Adjusted	Fixed Currency	Impact of Acquisitions and Divestitures	Acquisition Adjusted
(millions)						
Global Industrial	\$854.7	\$1.3	\$856.0	\$724.4	\$(3.0)	\$721.4
Global Institutional	1,042.2	4.3	1,046.5	1,007.3	-	1,007.3
Global Energy	379.1	0.3	379.4	338.5	2.6	341.1
Other	167.3	(0.4)	166.9	160.0	-	160.0
Corporate	(159.0)	-	(159.0)	(167.6)	-	(167.6)
Non-GAAP adjusted fixed currency operating income	2,284.3	5.5	2,289.8	2,062.6	(0.4)	2,062.2
Special (gains) and charges	250.1			136.0		
Subtotal at fixed currency	2,034.2			1,926.6		
Effect of foreign currency translation	(20.4)			20.4		
Total reported operating income	\$2,013.8			\$1,947.0		

Global Industrial

	2019	2018	2017
Sales at fixed currency (millions)	\$5,569.9	\$5,220.2	\$4,895.8
Sales at public currency (millions)	5,500.7	5,286.5	4,918.0
Volume	2 %	4 %	
Price changes	3 %	2 %	
Acquisition adjusted fixed currency sales change	5 %	6 %	
Acquisitions and divestitures	2 %	1 %	
Fixed currency sales change	7 %	7 %	
Foreign currency translation	(3)%	1 %	
Public currency sales change	4 %	7 %	
Operating income at fixed currency (millions)	\$854.7	\$724.4	\$722.0
Operating income at public currency (millions)	844.5	735.6	727.1
Fixed currency operating income change	18 %	0 %	
Fixed currency operating income margin	15.3 %	13.9 %	14.7 %
Acquisition adjusted fixed currency operating income change	19 %	1 %	
Acquisition adjusted fixed currency operating income margin	15.7 %	13.9 %	*
Public currency operating income change	15 %	1 %	

* Not meaningful

Amounts do not necessarily sum due to rounding.

Net Sales

Fixed currency sales growth for Global Industrial in both 2019 and 2018 was driven by pricing and volume gains. The 2019 sales increase was impacted by growth in all regions. Regional results for 2018 were impacted by good growth in North America and Europe.

At an operating segment level, **Water** fixed currency sales increased 6% and 7% in 2019 and 2018, respectively. In both 2019 and 2018, Light industry sales growth was led by innovative technology and service offerings. Heavy industry sales benefited from sales force investments and improved market conditions while mining sales were led by new business wins. **Food & Beverage** fixed currency sales increased 9% (6% acquisition adjusted) in 2019 as share gains and pricing more than offset generally flat industry trends. Globally, we saw strong growth in our dairy, food, beverage and brewing segments, with moderate growth in the protein business. Fixed currency sales growth was strong across major regions. Fixed currency sales increased 6% in 2018, benefiting from corporate account wins, share gains and pricing, which more than offset generally flat industry trends. Growth was led by the beverage and brewing, dairy and protein businesses. **Paper** fixed currency sales increased 1% in 2019 despite softer containerboard market conditions which reduced volumes in major regions. Fixed currency sales increased 11% (6% acquisition adjusted) in 2018 driven by business wins and pricing. **Textile Care** fixed currency sales increased 2% and 1% in 2019 and 2018, respectively. **Life Sciences** fixed currency sales increased 37% in 2019 (12% acquisition adjusted). Results were led by business wins and pricing in our cleaning and disinfection programs for both the pharmaceutical and personal care markets, with strong growth in Europe and moderate North America gains. Fixed currency sales increased 14% in 2018 driven by good growth from business wins and pricing execution in both the pharmaceutical and personal care markets.

Operating Income

Fixed currency operating income for Global Industrial increased in 2019 while 2018 was flat when compared to prior periods. Fixed currency operating income margins increased in 2019 and decreased in 2018.

Acquisition adjusted fixed currency operating income margins increased 1.8 percentage points in 2019. The favorable impact of pricing added approximately 2.7 percentage points during 2019. Investments in the business negatively impacted margins by approximately 1.1 percentage points. Acquisition adjusted fixed currency operating income margins decreased in 2018 compared to 2017, negatively impacted by higher delivered product costs and investments in the business, partially offset by favorable impact of pricing and volume gains.

Global Institutional

	2019	2018	2017
Sales at fixed currency (millions)	\$5,235.5	\$5,066.0	\$4,785.8
Sales at public currency (millions)	5,187.0	5,098.5	4,776.2
Volume	1 %	3 %	
Price changes	2 %	2 %	
Acquisition adjusted fixed currency sales change	3 %	5 %	
Acquisitions and divestitures	1 %	1 %	
Fixed currency sales change	3 %	6 %	
Foreign currency translation	(2)%	1 %	
Public currency sales change	2 %	7 %	
Operating income at fixed currency (millions)	\$1,042.2	\$1,007.3	\$962.7
Operating income at public currency (millions)	1,035.7	1,010.6	963.9
Fixed currency operating income change	3 %	5 %	
Fixed currency operating income margin	19.9 %	19.9 %	20.1 %
Acquisition adjusted fixed currency operating income change	4 %	4 %	
Acquisition adjusted fixed currency operating income margin	20.1 %	19.9 %	*
Public currency operating income change	2 %	5 %	

* Not meaningful

Amounts do not necessarily sum due to rounding.

Net Sales

Fixed currency sales growth for Global Institutional in both 2019 and 2018 benefited from pricing, volume growth and acquisitions. At a regional level, the 2019 sales increases were led by good growth in North America.

At an operating segment level, **Institutional** fixed currency sales increased 2% in 2019, reflecting the benefits of new products and business wins. Fixed currency sales increased 5% in 2018. Global lodging demand continued to show moderate growth while global full-service restaurant industry foot traffic remained soft. **Specialty** fixed currency sales increased 9% in 2019, reflecting strong ongoing business and program wins. Fixed currency sales increased 8% in 2018, led primarily from strong ongoing business and new account wins. **Healthcare** fixed currency sales increased 1% in 2019. At a regional level, good growth in Europe was offset by a product recall while North America sales were flat with good differentiated product and program growth which was partially offset by lower sales of deemphasized non-core products. Fixed currency sales increased 7% (2% acquisition adjusted) in 2018, with strong sales of environmental hygiene programs partially offset by lower sales of non-core products.

Operating Income

Fixed currency operating income for our Global Institutional segment increased in both 2019 and 2018 when compared to prior periods. Fixed currency operating income margins remained flat in 2019 and declined slightly in 2018.

Acquisition adjusted fixed currency operating income margins increased 0.2 percentage points during 2019. The favorable impact of pricing and volume added approximately 1.9 percentage points during 2019. Investments in the business and selling related expenses negatively impacted margins by approximately 1.7 percentage points. Acquisition adjusted fixed currency operating income margins decreased in 2018, negatively impacted by investments in the business, including innovative digital technologies, and higher delivered product costs, partially offset by favorable impact of sales volume gains, pricing and cost savings.

Global Energy

	2019	2018	2017
Sales at fixed currency (millions)	\$3,334.0	\$3,388.8	\$3,205.8
Sales at public currency (millions)	3,317.7	3,421.1	3,230.0
Volume	(3)%	5 %	
Price changes	2 %	2 %	
Acquisition adjusted fixed currency sales change	(2)%	7 %	
Acquisitions and divestitures	(0)%	(1)%	
Fixed currency sales change	(2)%	6 %	
Foreign currency translation	(1)%	0 %	
Public currency sales change	(3)%	6 %	
Operating income at fixed currency (millions)	\$379.1	\$338.5	\$322.9
Operating income at public currency (millions)	375.3	344.7	327.7
Fixed currency operating income change	12 %	5 %	
Fixed currency operating income margin	11.4 %	10.0 %	10.1 %
Acquisition adjusted fixed currency operating income change	11 %	7 %	
Acquisition adjusted fixed currency operating income margin	11.4 %	10.1 %	*
Public currency operating income change	9 %	5 %	

* Not meaningful

Amounts do not necessarily sum due to rounding.

Net Sales

Fixed currency sales for Global Energy decreased 2% in 2019. Upstream (being renamed ChampionX) sales declined 3% as a significant decline in the well stimulation business (reflecting the reduced North American industry drilling and completion activity) was partially offset by good growth in production sales. Downstream fixed currency sales increased 1% driven by pricing and new business wins in Europe and Asia Pacific. Fixed currency sales for Global Energy in 2018 had strong growth in the well stimulation business and moderate growth in the production business driven by increased North America activity. Downstream fixed currency sales increased driven by pricing and new business wins in North America, Asia Pacific, and Middle East.

Operating Income

Fixed currency operating income for Global Energy increased during 2019 and 2018 as compared to the prior year. Fixed currency operating income margins increased in 2019 and decreased in 2018.

Acquisition adjusted fixed currency operating income margins improved in 2019 and were flat in 2018. Pricing and cost savings favorably impacted margins by approximately 2.5 percentage points during 2019. These gains more than offset the 0.9 percentage point unfavorable impact of lower sales volume. Sales volume gains and pricing favorably impacted 2018, equally offset by higher delivered product costs and investments in the business.

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Other

	2019	2018	2017
Sales at fixed currency (millions)	\$907.5	\$855.7	\$910.7
Sales at public currency (millions)	900.9	862.1	911.7
Volume	4 %	6 %	
Price changes	2 %	2 %	
Acquisition adjusted fixed currency sales change	6 %	7 %	
Acquisitions and divestitures	0 %	(13)%	
Fixed currency sales change	6 %	(6)%	
Foreign currency translation	(2)%	1 %	
Public currency sales change	5 %	(5)%	
Operating income at fixed currency (millions)	\$167.3	\$160.0	\$140.7
Operating income at public currency (millions)	166.2	160.7	141.5
Fixed currency operating income change	5 %	14 %	
Fixed currency operating income margin	18.4 %	18.7 %	15.4 %
Acquisition adjusted fixed currency operating income change	4 %	17 %	
Acquisition adjusted fixed currency operating income margin	18.4 %	18.7 %	*
Public currency operating income change	3 %	14 %	

* Not meaningful

Amounts do not necessarily sum due to rounding.

Net Sales

Fixed currency sales for Other increased in 2019 with growth in all regions. Fixed currency sales decreased in 2018 driven by the divestiture of Equipment Care in the fourth quarter of 2017.

At an operating segment level, **Pest Elimination** fixed currency sales increased 6% in 2019 with good growth across all major regions and markets. Fixed currency sales increased 13% (7% acquisition adjusted) in 2018 led by sales to food, beverage and hospitality markets. **CTG** fixed currency sales increased 5% in 2019 and 10% in 2018.

Operating Income

Fixed currency operating income in Other increased during 2019 and 2018 as compared to the prior year. Fixed currency operating income margins decreased in 2019 and increased in 2018.

Acquisition adjusted fixed currency operating income margins in Other decreased 0.3 percentage points in 2019. Field investments negatively impacted margins by approximately 2.2 percentage points, which more than offset the 1.7 percentage points of favorable pricing increases. Acquisition adjusted fixed currency operating income margins increased in 2018, positively impacted by sales volume and pricing increases, partially offset by field investments.

Corporate

Consistent with our internal management reporting, Corporate expense amounts in the table on page 38 include intangible asset amortization specifically from the Nalco merger and special (gains) and charges that are not allocated to our reportable segments. Items included within special (gains) and charges are shown in the table on page 33.

FINANCIAL POSITION, CASH FLOW AND LIQUIDITY

Financial Position

Total assets were \$20.9 billion as of December 31, 2019, compared to total assets of \$20.1 billion as of December 31, 2018.

Total liabilities were \$12.1 billion as of December 31, 2019, compared to total liabilities of \$12.0 billion as of December 31, 2018. Total debt was \$6.4 billion as of December 31, 2019 and \$7.0 billion as of December 31, 2018. See further discussion of our debt activity within the "Liquidity and Capital Resources" section of this MD&A.

Our net debt to EBITDA is shown in the following table. EBITDA is a non-GAAP measure discussed further in the "Non-GAAP Financial Measures" section of this MD&A.

	2019	2018	2017
(ratio)			
Net debt to EBITDA	2.0	2.3	2.4
(millions)			
Total debt	\$6,354.1	\$7,045.2	\$7,322.7
Cash	186.4	114.7	211.4
Net debt	\$6,167.7	\$6,930.5	\$7,111.3
Net income including noncontrolling interest	\$1,576.2	\$1,440.3	\$1,518.6
Provision for income taxes	322.7	364.3	243.8
Interest expense, net	191.2	222.3	255.0
Depreciation	654.1	621.3	585.7
Amortization	319.2	317.0	307.6
EBITDA	\$3,063.4	\$2,965.2	\$2,910.7

Cash Flows

Operating Activities

	2019	2018	2017	2019	2018
				Dollar Change	
(millions)					
Cash provided by operating activities	\$2,420.7	\$2,277.7	\$2,091.3	\$143.0	\$186.4

We continue to generate strong cash flow from operations, allowing us to fund our ongoing operations, acquisitions, investments in the business and pension obligations along with returning cash to our shareholders through dividend payments and share repurchases.

Comparability of cash generated from operating activities across 2019 to 2017 was impacted by fluctuations in accounts receivable, inventories and accounts payable ("working capital"), the combination of which increased \$74 million, \$192 million and \$56 million in 2019, 2018 and 2017 respectively. The cash flow impact across the three years from working capital accounts was driven by changes in sales volumes and timing of collections; timing of purchases and production and usage levels; and volume of purchases and timing of payments.

The impact on operating cash flows of pension and postretirement plan contributions, cash activity related to restructuring, cash paid for income taxes and cash paid for interest, are shown in the following table:

	2019	2018	2017	2019	2018
				Dollar Change	
(millions)					
Pensions and postretirement plan contributions	\$186.0	\$60.0	\$144.1	\$126.0	\$(84.1)
Restructuring payments	100.9	57.9	39.2	43.0	18.7
Income tax payments	356.3	395.2	402.8	(38.9)	(7.6)
Interest payments	189.4	206.4	239.3	(17.0)	(32.9)

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Investing Activities

	Dollar Change				
(millions)	2019	2018	2017	2019	2018
Cash used for investing activities	\$(1,199.1)	\$(1,030.0)	\$(1,727.0)	\$(169.1)	\$697.0

Cash used for investing activities is primarily impacted by the timing of business acquisitions and dispositions as well as from capital investments in the business.

Total cash paid for acquisitions, net of cash acquired and net of cash received from dispositions, in 2019, 2018 and 2017 was \$385 million, \$221 million and \$870 million, respectively. Our acquisitions and divestitures are discussed further in Note 4. We continue to target strategic business acquisitions which complement our growth strategy and expect to continue to make capital investments and acquisitions in the future to support our long-term growth.

We continue to make capital investments in the business, including merchandising and customer equipment and manufacturing facilities. Total capital expenditures were \$801 million, \$847 million and \$869 million in 2019, 2018 and 2017, respectively.

Financing Activities

	Dollar Change				
(millions)	2019	2018	2017	2019	2018
Cash used for financing activities	\$(1,349.6)	\$(1,172.7)	\$(522.7)	\$(176.9)	\$(650.0)

Our cash flows from financing activities primarily reflect the issuances and repayment of debt, common stock repurchases, proceeds from common stock issuances related to our equity incentive programs, dividend payments and acquisition-related contingent considerations.

Shares are repurchased for the purpose of partially offsetting the dilutive effect of our equity compensation plans and stock issued in acquisitions, to manage our capital structure and to efficiently return capital to shareholders. We repurchased a total of \$354 million, \$562 million, and \$600 million of shares in 2019, 2018 and 2017, respectively. 2017 amount includes \$300 million of shares repurchased through an Accelerated Stock Repurchase ("ASR") agreement. See Note 10 for further information regarding the ASR agreement.

The impact on financing cash flows of commercial paper and notes payable repayments, long-term debt borrowings and long-term debt repayments, are shown in the following table:

	Dollar Change				
(millions)	2019	2018	2017	2019	2018
Net issuances (repayments) of commercial paper and notes payable	\$(252.0)	\$341.8	\$(43.7)	\$(593.8)	\$385.5
Long-term debt borrowings	-	-	1,309.4	-	(1,309.4)
Long-term debt repayments	(400.6)	(551.6)	(799.0)	151.0	247.4

In December 2019, we increased our indicated annual dividend rate by 2%. This represents the 28th consecutive year we have increased our dividend. We have paid dividends on our common stock for 83 consecutive years. Cash dividends declared per share of common stock, by quarter, for each of the last three years were as follows:

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
2019	\$0.46	\$0.46	\$0.46	\$0.47	\$1.85
2018	\$0.41	\$0.41	\$0.41	\$0.46	\$1.69
2017	\$0.37	\$0.37	\$0.37	\$0.41	\$1.52

Liquidity and Capital Resources

We currently expect to fund all of our cash requirements which are reasonably foreseeable for the next twelve months, including scheduled debt repayments, new investments in the business, share repurchases, dividend payments, possible business acquisitions and pension and postretirement contributions with cash from operating activities, and as needed, additional short-term and/or long-term borrowings. We continue to expect our operating cash flow to remain strong.

As of December 31, 2019, we had \$186 million of cash and cash equivalents on hand, of which \$159 million was held outside of the U.S. As of December 31, 2018, we had \$115 million of cash and cash equivalents on hand, substantially all of which was held outside of the U.S.

As of December 31, 2019, we had a \$2.0 billion multi-year credit facility, which expires in November 2022. The credit facility has been established with a diverse syndicate of banks and supports our U.S. and Euro commercial paper programs. The maximum aggregate amount of commercial paper that may be issued under our U.S. commercial paper program and our Euro commercial paper program may not exceed \$2.0 billion. At year-end, we had \$55.1 million (€50.0 million) of commercial paper outstanding under the Euro commercial paper program and no borrowings under the U.S. commercial paper program. There were no borrowings under our credit facility as of December 31, 2019 or 2018. As of December 31, 2019, both programs were rated A-2 by Standard & Poor's, P-2 by Moody's and F-1 by Fitch.

Additionally, we have uncommitted credit lines with major international banks and financial institutions. These credit lines support our daily global funding needs, primarily our global cash pooling structures. We have \$165 million of bank supported letters of credit, surety bonds and guarantees outstanding in support of our commercial business transactions. We do not have any other significant unconditional purchase obligations or commercial commitments.

As of December 31, 2019, Standard & Poor's and Fitch both rated our long-term credit at A- (stable outlook) and Moody's rated our long-term credit at Baa1 (positive outlook). A reduction in our credit ratings could limit or preclude our ability to issue commercial paper under our current programs or could also adversely affect our ability to renew existing, or negotiate new, credit facilities in the future and could increase the cost of these facilities.

We are in compliance with our debt covenants and other requirements of our credit agreements and indentures.

A schedule of our various obligations as of December 31, 2019 are summarized in the following table:

(millions)	Total	Payments Due by Period			More Than 5 Years
		Less Than 1 Year	2-3 Years	4-5 Years	
Notes payable	\$ 25	\$ 25	\$ -	\$ -	\$ -
One-time transition tax	106	7	-	27	72
Long-term debt	6,271	300	1,516	1,276	3,179
Operating leases	659	174	259	105	121
Interest*	2,240	212	370	260	1,398
Total	\$ 9,301	\$ 718	\$ 2,145	\$ 1,668	\$ 4,770

* Interest on variable rate debt was calculated using the interest rate at year-end 2019.

As of December 31, 2019, our gross liability for uncertain tax positions was \$28 million. We are not able to reasonably estimate the amount by which the liability will increase or decrease over an extended period of time or whether a cash settlement of the liability will be required. Therefore, these amounts have been excluded from the schedule of contractual obligations.

We do not have required minimum cash contribution obligations for our qualified pension plans in 2020. We are required to fund certain international pension benefit plans in accordance with local legal requirements. We estimate contributions to be made to our international plans will approximate \$46 million in 2020. These amounts have been excluded from the schedule of contractual obligations.

We lease certain sales and administrative office facilities, distribution centers, research and manufacturing facilities and other equipment under longer-term operating leases. Vehicle leases are generally shorter in duration. Vehicle leases have residual value requirements that have historically been satisfied primarily by the proceeds on the sale of the vehicles.

Off-Balance Sheet Arrangements

We do not participate in off-balance sheet financing arrangements. Operating leases were not recorded on the Consolidated Balance Sheet in 2018 or 2017. Through the normal course of business, we have established various joint ventures, some of which have not been consolidated within our financial statements as we neither control, nor are the primary beneficiary. The joint ventures help us meet local ownership requirements, achieve quicker operational scale, expand our ability to provide customers a more fully integrated offering or provide other benefits to our business or customers. These entities have not been utilized as special purposes entities, which are sometimes established for the purpose of facilitating off-balance sheet financial arrangements or other contractually narrow or limited purposes. As such, we are not exposed to financing, liquidity, market or credit risk that could arise if we had engaged in such relationships.

Market Risk

We enter into contractual arrangements (derivatives) in the ordinary course of business to manage foreign currency exposure and interest rate risks. We do not enter into derivatives for speculative or trading purposes. Our use of derivatives is subject to internal policies that provide guidelines for control, counterparty risk, and ongoing monitoring and reporting, and is designed to reduce the volatility associated with movements in foreign exchange and interest rates on our income statement and cash flows.

We enter into foreign currency forward contracts to hedge certain intercompany financial arrangements, and to hedge against the effect of exchange rate fluctuations on transactions related to cash flows denominated in currencies other than U.S. dollars. We use net investment hedges as hedging instruments to manage risks associated with our investments in foreign operations. As of December 31, 2019, we had a total of €1,150 million senior notes designated as net investment hedges.

We manage interest expense using a mix of fixed and floating rate debt. To help manage borrowing costs, we may enter into interest rate swap agreements. Under these arrangements, we agree to exchange, at specified intervals, the difference between fixed and floating interest amounts calculated by reference to an agreed-upon notional principal amount. As of December 31, 2019, we had no interest rate swaps outstanding.

See Note 8 for further information on our hedging activity.

Based on a sensitivity analysis (assuming a 10% change in market rates) of our foreign exchange and interest rate derivatives and other financial instruments, changes in exchange rates or interest rates would increase/decrease our financial position and liquidity by approximately \$257 million. The effect on our results of operations would be substantially offset by the impact of the hedged items.

GLOBAL ECONOMIC AND POLITICAL ENVIRONMENT

Energy Markets

Approximately 22% of our sales are generated from our Global Energy segment, the results of which are subject to volatility in the oil and gas commodity markets. During 2019, the North American oil industry drilling and production activity slowed from 2018 levels, while international activity showed modest improvement. Demand for oil and overall energy consumption has shown modest growth with oil prices well above their lows in early 2016.

Our global footprint and broad business portfolio within the Global Energy segment, as well as our strong execution capabilities are expected to provide the required resilience to perform well in the current market. As such, we continue to remain confident in the long-term growth prospects of the segment.

Global Economies

Almost half of our sales are outside of the United States. Our international operations subject us to changes in economic conditions and foreign currency exchange rates as well as political uncertainty in some countries which could impact future operating results.

Argentina has continued to experience negative economic trends, evidenced by multiple periods of increasing inflation rates, devaluation of the Argentine Peso, and increasing borrowing rates. Argentina is classified as a highly inflationary economy in accordance with U.S. GAAP, and the U.S. dollar is the functional currency for our subsidiaries in Argentina. During 2019, sales in Argentina represented less than 1% of our consolidated sales. Assets held in Argentina at the end of 2019 represented less than 1% of our consolidated assets.

The coronavirus has had a negative impact on market conditions and customer demand, starting in China. We anticipate an impact to our 2020 sales from lower market demand, but we are not yet able to estimate the full impact of the coronavirus outbreak as it continues to spread beyond China.

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Brexit Referendum

Effective on January 31, 2020, the U.K. has formally left the European Union. The U.K.'s relationship with the EU will no longer be governed by the EU Treaties, but instead by the terms of the Withdrawal Agreement agreed between the U.K. and the EU in late 2019. The Withdrawal Agreement provides for a "transition" period, which commenced the moment the U.K. leaves the EU and is currently set to end on December 31, 2020. At the end of the transition period, there may be significant changes to the U.K.'s business environment. While the effects of Brexit will depend on any agreements the U.K. makes to retain access to EU markets or the failure to reach such agreements, the uncertainties created by Brexit, any resolution between the U.K. and EU countries or the failure to reach any such resolutions, could adversely affect our relationships with customers, suppliers and employees and could adversely affect our business.

During 2019, net sales of our U.K. operations were approximately 3% of our consolidated net sales.

NEW ACCOUNTING PRONOUNCEMENTS

Information regarding new accounting pronouncements is included in Note 2.

SUBSEQUENT EVENTS

Subsequent to year-end, we reached an agreement to purchase CID Lines, a leading global provider of livestock biosecurity and hygiene solutions. The acquisition is expected to close in the second quarter of 2020 subject to various regulatory clearances.

NON-GAAP FINANCIAL MEASURES

This MD&A includes financial measures that have not been calculated in accordance with U.S. GAAP. These non-GAAP measures include:

- Fixed currency sales
- Acquisition adjusted fixed currency sales
- Adjusted cost of sales
- Adjusted gross margin
- Fixed currency operating income
- Fixed currency operating income margin
- Adjusted operating income
- Adjusted operating income margin
- Adjusted fixed currency operating income
- Adjusted fixed currency operating income margin
- Acquisition adjusted fixed currency operating income
- Acquisition adjusted fixed currency operating income margin
- Adjusted other (income) expense
- Adjusted interest expense, net
- EBITDA
- Adjusted tax rate
- Adjusted net income attributable to Ecolab
- Adjusted diluted EPS

We provide these measures as additional information regarding our operating results. We use these non-GAAP measures internally to evaluate our performance and in making financial and operational decisions, including with respect to incentive compensation. We believe that our presentation of these measures provides investors with greater transparency with respect to our results of operations and that these measures are useful for period-to-period comparison of results.

Our non-GAAP financial measures for cost of sales, gross margin, interest expense and operating income exclude the impact of special (gains) and charges, and our non-GAAP measures for tax rate, net income attributable to Ecolab and diluted EPS further exclude the impact of discrete tax items. We include items within special (gains) and charges and discrete tax items that we believe can significantly affect the period-over-period assessment of operating results and not necessarily reflect costs and/or income associated with historical trends and future results. After tax special (gains) and charges are derived by applying the applicable local jurisdictional tax rate to the corresponding pre-tax special (gains) and charges.

EBITDA is defined as the sum of net income including non-controlling interest, provision for income taxes, net interest expense, depreciation and amortization. EBITDA is used in our net debt to EBITDA ratio, which we view as important indicators of the operational and financial health of our organization.

We evaluate the performance of our international operations based on fixed currency rates of foreign exchange. Fixed currency amounts included in this Form 10-K are based on translation into U.S. dollars at the fixed foreign currency exchange rates established by management at the beginning of 2019. Fixed currency amounts during 2018 for Argentina operations are reflected at the Argentine Peso rate established by management at the beginning of the year.

Acquisition adjusted growth rates exclude the results of our acquired businesses from the first twelve months post acquisition, exclude the results of our divested businesses from the twelve months prior to divestiture.

These non-GAAP measures are not in accordance with, or an alternative to U.S. GAAP, and may be different from non-GAAP measures used by other companies. Investors should not rely on any single financial measure when evaluating our business. We recommend that investors view these measures in conjunction with the U.S. GAAP measures included in this MD&A and we have provided reconciliations of reported U.S. GAAP amounts to the non-GAAP amounts.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk.

The discussion under the heading entitled "Market Risk" and "Global Economic and Political Environment" is incorporated by reference from Part II, Item 7 of this Form 10-K.

[Item 8. Financial Statements and Supplementary Data.](#)

REPORTS OF MANAGEMENT

To our Shareholders:

Management's Responsibility for Financial Statements

Management is responsible for the integrity and objectivity of the consolidated financial statements. The statements have been prepared in accordance with accounting principles generally accepted in the United States of America and, accordingly, include certain amounts based on management's best estimates and judgments.

The Board of Directors, acting through its Audit Committee composed solely of independent directors, is responsible for determining that management fulfills its responsibilities in the preparation of financial statements and maintains internal control over financial reporting. The Audit Committee recommends to the Board of Directors the appointment of the Company's independent registered public accounting firm, subject to ratification by the shareholders. It meets regularly with management, the internal auditors and the independent registered public accounting firm.

The independent registered public accounting firm has audited the consolidated financial statements included in this annual report and have expressed their opinion regarding whether these consolidated financial statements present fairly in all material respects our financial position and results of operation and cash flows as stated in their report presented separately herein.

Management's Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Under the supervision and with the participation of management, including the principal executive officer and principal financial officer, an evaluation of the design and operating effectiveness of internal control over financial reporting was conducted based on the 2013 framework in Internal Control — Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on the evaluation under the framework in Internal Control — Integrated Framework, management concluded that internal control over financial reporting was effective as of December 31, 2019.

The Company's independent registered public accounting firm, PricewaterhouseCoopers LLP, has audited the effectiveness of the Company's internal control over financial reporting as of December 31, 2019 as stated in their report which is included herein.



Douglas M. Baker, Jr.
Chairman and Chief Executive Officer



Daniel J. Schmechel
Chief Financial Officer

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors of Ecolab Inc.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Ecolab Inc. and its subsidiaries (the "Company") as of December 31, 2019 and 2018, and the related consolidated statements of income, comprehensive income, equity and cash flows for each of the three years in the period ended December 31, 2019, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("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 audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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 (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) 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 (iii) 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.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Goodwill Impairment Assessment – Global Energy Reporting Unit

As described in Note 2 to the consolidated financial statements, the carrying value of goodwill was \$7.3 billion as of December 31, 2019, which includes \$3.1 billion allocated to the Global Energy reporting unit. During the second quarter, management completed its annual assessment for goodwill impairment across its eleven reporting units. Management continued to assess the need to test its reporting units for impairment during interim periods since its scheduled annual assessments. The goodwill impairment assessment was completed through a two-step quantitative analysis, utilizing a discounted cash flow approach, which incorporates assumptions regarding future growth rates, terminal values, and discount rates. The first step involved comparing the estimated fair value of each reporting unit to the reporting unit's carrying value, including goodwill. If the carrying amount of the reporting unit exceeds its fair value, the second step of the goodwill impairment test would be performed to measure the amount of impairment loss to be recorded, if any.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment of the Global Energy reporting unit is a critical audit matter are i) there was a high degree of auditor judgment and subjectivity involved in applying procedures due to the significant amount of judgment by management when estimating the fair value of the reporting unit, ii) a high degree of audit effort was necessary to perform procedures and evaluate audit evidence related to the discount rate assumption, and (iii) the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing procedures and evaluating the audit evidence obtained from these procedures.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment assessment, including controls over the discount rate assumption used in the discounted cash flow approach to estimate the fair value of the Global Energy reporting unit. These procedures also included, among others, testing management's process for estimating the fair value, evaluating the appropriateness of the valuation approach used in management's estimate, and evaluating the reasonableness of the discount rate assumption used by management. The discount rate was evaluated by considering the cost of capital of comparable businesses and other industry factors. Professionals with specialized skill and knowledge were used to assist in evaluating the Company's valuation approach and the discount rate assumption.



PricewaterhouseCoopers LLP
Minneapolis, Minnesota
February 28, 2020

We have served as the Company's auditor since 1970.

CONSOLIDATED STATEMENT OF INCOME

(millions, except per share amounts)	2019	2018	2017
Product and equipment sales	\$12,238.9	\$12,128.6	\$11,431.8
Service and lease sales	2,667.4	2,539.6	2,404.1
Net sales	14,906.3	14,668.2	13,835.9
Product and equipment cost of sales	7,106.4	7,078.5	6,576.9
Service and lease cost of sales	1,617.0	1,547.4	1,487.3
Cost of sales (including special charges (a))	8,723.4	8,625.9	8,064.2
Selling, general and administrative expenses	3,957.5	3,968.6	3,825.3
Special (gains) and charges	211.6	126.7	(3.7)
Operating income	2,013.8	1,947.0	1,950.1
Other (income) expense (b)	(76.3)	(79.9)	(67.3)
Interest expense, net (c)	191.2	222.3	255.0
Income before income taxes	1,898.9	1,804.6	1,762.4
Provision for income taxes	322.7	364.3	243.8
Net income including noncontrolling interest	1,576.2	1,440.3	1,518.6
Net income attributable to noncontrolling interest	17.3	11.2	14.0
Net income attributable to Ecolab	\$1,558.9	\$1,429.1	\$1,504.6
Earnings attributable to Ecolab per common share			
Basic	\$ 5.41	\$ 4.95	\$ 5.20
Diluted	\$ 5.33	\$ 4.88	\$ 5.12
Weighted-average common shares outstanding			
Basic	288.1	288.6	289.6
Diluted	292.5	292.8	294.0

- (a) Cost of sales includes special charges of \$38.5 in 2019, \$9.3 in 2018, and \$44.0 in 2017, which is included in product and equipment cost of sales.
- (b) Other (income) expense includes special charges of \$9.5 in 2019.
- (c) Interest expense, net includes special charges of \$0.2 in 2019, \$0.3 in 2018 and \$21.9 in 2017.

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

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

(millions)	2019	2018	2017
Net income including noncontrolling interest	\$1,576.2	\$1,440.3	\$1,518.6
Other comprehensive income (loss), net of tax			
Foreign currency translation adjustments			
Foreign currency translation	(45.1)	(223.3)	208.0
Gain (loss) on net investment hedges	31.4	57.5	(109.7)
Total foreign currency translation adjustments	(13.7)	(165.8)	98.3
Derivatives and hedging instruments	(3.4)	28.4	(17.9)
Pension and postretirement benefits			
Current period net actuarial loss	(251.1)	(37.8)	(33.4)
Pension and postretirement prior period service (costs) and benefits	(0.3)	(2.3)	(0.5)
Amortization of net actuarial loss and prior service costs included in net periodic pension and postretirement costs	(0.2)	13.2	24.7
Postretirement benefits changes	-	44.9	-
Total pension and postretirement benefits	(251.6)	18.0	(9.2)
Subtotal	(268.7)	(119.4)	71.2
Total comprehensive income, including noncontrolling interest	1,307.5	1,320.9	1,589.8
Comprehensive income attributable to noncontrolling interest	15.4	10.1	15.7
Comprehensive income attributable to Ecolab	\$1,292.1	\$1,310.8	\$1,574.1

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

CONSOLIDATED BALANCE SHEET

(millions, except per share amounts)	2019	2018
ASSETS		
Current assets		
Cash and cash equivalents	\$186.4	\$114.7
Accounts receivable, net	2,796.5	2,662.5
Inventories	1,505.6	1,546.4
Other current assets	339.9	354.1
Total current assets	4,828.4	4,677.7
Property, plant and equipment, net	3,954.9	3,836.0
Goodwill	7,251.7	7,078.0
Other intangible assets, net	3,672.5	3,797.7
Operating lease assets	577.5	-
Other assets	584.1	685.1
Total assets	\$20,869.1	\$20,074.5
LIABILITIES AND EQUITY		
Current liabilities		
Short-term debt	\$380.6	\$743.6
Accounts payable	1,284.3	1,255.6
Compensation and benefits	599.5	579.7
Income taxes	142.8	100.6
Other current liabilities	1,223.4	1,006.1
Total current liabilities	3,630.6	3,685.6
Long-term debt	5,973.5	6,301.6
Postretirement health care and pension benefits	1,088.0	944.3
Deferred income taxes	740.4	764.6
Operating lease liabilities	425.2	-
Other liabilities	285.6	324.8
Total liabilities	12,143.3	12,020.9
Commitments and contingencies (Note 15)		
Equity (a)		
Common stock	359.6	357.0
Additional paid-in capital	5,907.1	5,633.2
Retained earnings	9,993.7	8,909.5
Accumulated other comprehensive loss	(2,089.7)	(1,761.7)
Treasury stock	(5,485.4)	(5,134.8)
Total Ecolab shareholders' equity	8,685.3	8,003.2
Noncontrolling interest	40.5	50.4
Total equity	8,725.8	8,053.6
Total liabilities and equity	\$20,869.1	\$20,074.5

(a) Common stock, 800.0 shares authorized, \$1.00 par value, 288.4 shares outstanding at December 31, 2019 and 287.7 shares outstanding at December 31, 2018. Shares outstanding are net of treasury stock.

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

CONSOLIDATED STATEMENT OF CASH FLOWS

(millions)	2019	2018	2017
OPERATING ACTIVITIES			
Net income including noncontrolling interest	\$1,576.2	\$1,440.3	\$1,518.6
Adjustments to reconcile net income to cash provided by operating activities:			
Depreciation	654.1	621.3	585.7
Amortization	319.2	317.0	307.6
Deferred income taxes	(37.6)	85.1	(353.5)
Share-based compensation expense	91.1	94.4	90.5
Pension and postretirement plan contributions	(186.0)	(60.0)	(144.1)
Pension and postretirement plan expense	28.1	31.9	36.9
Restructuring charges, net of cash paid	35.2	43.5	5.2
Gain on sale of businesses	-	-	(50.6)
Asset charges and write-downs	-	-	15.1
Other, net	19.8	24.0	37.4
Changes in operating assets and liabilities, net of effect of acquisitions:			
Accounts receivable	(137.2)	(164.1)	(91.5)
Inventories	41.0	(141.1)	(85.5)
Other assets	(81.5)	(80.7)	(48.9)
Accounts payable	22.3	113.5	121.1
Other liabilities	76.0	(47.4)	147.3
Cash provided by operating activities	2,420.7	2,277.7	2,091.3
INVESTING ACTIVITIES			
Capital expenditures	(800.6)	(847.1)	(868.6)
Property and other assets sold	10.9	30.0	10.7
Acquisitions and investments in affiliates, net of cash acquired	(391.4)	(229.8)	(989.2)
Divestiture of businesses	6.8	9.2	118.8
Settlement of net investment hedges	-	14.1	2.1
Other, net	(24.8)	(6.4)	(0.8)
Cash used for investing activities	(1,199.1)	(1,030.0)	(1,727.0)
FINANCING ACTIVITIES			
Net issuances (repayments) of commercial paper and notes payable	(252.0)	341.8	(43.7)
Long-term debt borrowings	-	-	1,309.4
Long-term debt repayments	(400.6)	(551.6)	(799.0)
Reacquired shares	(353.7)	(562.4)	(600.3)
Dividends paid	(554.9)	(496.5)	(448.7)
Exercise of employee stock options	186.8	114.5	83.8
Acquisition related liabilities and contingent consideration	(1.5)	(10.1)	(8.5)
Other, net	26.3	(8.4)	(15.7)
Cash used for financing activities	(1,349.6)	(1,172.7)	(522.7)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	20.4	7.6	(10.6)
(Decrease) increase in cash, cash equivalents and restricted cash	(107.6)	82.6	(169.0)
Cash, cash equivalents and restricted cash, beginning of period (a)	294.0	211.4	380.4
Cash, cash equivalents and restricted cash, end of period (b)	\$186.4	\$294.0	\$211.4
SUPPLEMENTAL CASH FLOW INFORMATION			
Income taxes paid	\$356.3	\$395.2	\$402.8
Net interest paid	189.4	206.4	239.3

Restricted cash is recorded in Other assets on the Consolidated Balance Sheet

- (a) Beginning of period 2019, 2018, and 2017 included restricted cash of \$179.3, \$0 and \$53.0, respectively.
- (b) Restricted cash was \$0, \$179.3 and \$0 as of December 31, 2019, 2018 and 2017, respectively.

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

CONSOLIDATED STATEMENT OF EQUITY

(millions, except shares and per share amounts)	Common Stock	Additional Paid-in Capital	Retained Earnings	OCI (Loss)	Treasury Stock	Ecolab Shareholders' Equity	Non-Controlling Interest	Total Equity
Balance, December 31, 2016	\$352.6	\$5,270.8	\$6,945.1	\$(1,712.9)	\$(3,984.4)	\$6,871.2	\$69.8	\$6,941.0
New accounting guidance adoption (a)			1.9			1.9		1.9
Net income			1,504.6			1,504.6	14.0	1,518.6
Comprehensive income (loss) activity				69.5		69.5	1.7	71.2
Cash dividends declared (b)			(440.0)			(440.0)	(19.3)	(459.3)
Acquisition of noncontrolling interests							4.0	4.0
Stock options and awards	2.1	170.3			4.3	176.7		176.7
Reacquired shares		(5.4)			(594.9)	(600.3)		(600.3)
Balance, December 31, 2017	354.7	5,435.7	8,011.6	(1,643.4)	(4,575.0)	7,583.6	70.2	7,653.8
New accounting guidance adoption (c)			(43.6)			(43.6)		(43.6)
Net income			1,429.1			1,429.1	11.2	1,440.3
Comprehensive income (loss) activity				(118.3)		(118.3)	(1.1)	(119.4)
Cash dividends declared (b)			(487.6)			(487.6)	(22.7)	(510.3)
Changes in noncontrolling interests		(7.7)				(7.7)	(7.2)	(14.9)
Stock options and awards	2.3	205.2			2.5	210.0		210.0
Reacquired shares					(562.3)	(562.3)		(562.3)
Balance, December 31, 2018	357.0	5,633.2	8,909.5	(1,761.7)	(5,134.8)	8,003.2	50.4	8,053.6
New accounting guidance adoption (d)			58.4	(61.2)		(2.8)		(2.8)
Net income			1,558.9			1,558.9	17.3	1,576.2
Comprehensive income (loss) activity				(266.8)		(266.8)	(1.9)	(268.7)
Cash dividends declared (b)			(533.1)			(533.1)	(25.1)	(558.2)
Changes in noncontrolling interests		0.2				0.2	(0.2)	-
Stock options and awards	2.6	273.7			3.1	279.4		279.4
Reacquired shares					(353.7)	(353.7)		(353.7)
Balance, December 31, 2019	\$359.6	\$5,907.1	\$9,993.7	\$(2,089.7)	\$(5,485.4)	\$8,685.3	\$40.5	\$8,725.8

- (a) In 2017, upon adoption of ASU 2016-09, Compensation – Stock Compensation, the Company released a valuation allowance for previously unrecognized excess tax benefits resulting in an adjustment to retained earnings.
- (b) Dividends declared per common share were \$1.85, \$1.69 and \$1.52 in 2019, 2018 and 2017, respectively.
- (c) In 2018, upon adoption of ASU 2016-16, Intra-Entity Transfers of Assets Other than Inventory, the Company recorded an adjustment to retained earnings representing the write-off of income tax effects that had been deferred from past transactions and the recording of deferred tax assets which previously were not allowed to be recognized.
- (d) In 2019, upon adoption of ASU 2018-02, Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income, the Company reclassified stranded tax effects resulting from the Tax Cut and Jobs Act from accumulated other comprehensive income to retained earnings. Also, upon adoption of ASU 2016-02, Leases (Topic 842), the Company has established right-of-use assets and lease liabilities for operating leases and the cumulative effect of applying the standard is recognized in retained earnings at the beginning of the period adopted.

See Note 2 for additional information regarding adoption of new accounting standards.

COMMON STOCK ACTIVITY

Year ended December 31	2019		2018		2017	
	Common Stock	Treasury Stock	Common Stock	Treasury Stock	Common Stock	Treasury Stock
Shares, beginning of year	356,958,100	(69,243,979)	354,715,896	(65,393,098)	352,607,741	(60,782,667)
Stock options	2,220,815	41,575	1,833,004	38,679	1,714,214	41,767
Stock awards	390,319	29,173	409,200	18,481	393,941	55,431
Reacquired shares	-	(1,986,241)	-	(3,908,041)	-	(4,707,629)
Shares, end of year	359,569,234	(71,159,472)	356,958,100	(69,243,979)	354,715,896	(65,393,098)

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

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. NATURE OF BUSINESS

Ecolab is the global leader in water, hygiene and energy technologies and services that protect people and vital resources. The Company delivers comprehensive solutions and on-site service to promote safe food, maintain clean environments, optimize water and energy use and improve operational efficiencies for customers in the food, healthcare, energy, hospitality and industrial markets in more than 170 countries.

The Company's cleaning and sanitizing programs and products and pest elimination services support customers in the foodservice, food and beverage processing, hospitality, healthcare, government and education, retail, textile care and commercial facilities management sectors. The Company's products and technologies are also used in water treatment, pollution control, energy conservation, oil production and refining, steelmaking, papermaking, mining and other industrial processes.

ChampionX Separation

On December 18, 2019, the Company entered into definitive agreements with ChampionX Holding Inc., a wholly owned subsidiary of the Company (ChampionX), and Apergy Corporation (Apergy) pursuant to which the Company will separate the Upstream Energy business of its Global Energy segment and combine it with Apergy in a tax-efficient reverse Morris Trust transaction. Subject to the terms and conditions of those agreements, the Company will transfer the Upstream Energy business of its Global Energy segment to ChampionX, after which, the Company will distribute by means of a split-off all of the issued and outstanding shares of common stock of ChampionX held by the Company, and immediately after the distribution of ChampionX common stock, a wholly owned subsidiary of Apergy, will merge with and into ChampionX, with ChampionX surviving as a wholly owned subsidiary of Apergy and the shares of ChampionX common stock being converted into shares of Apergy common stock. Upon completion of the merger, ChampionX's stockholders will receive approximately 62% of the outstanding common stock of Apergy on a fully diluted basis. Completion of the transaction is subject to the satisfaction or waiver of customary closing conditions, including approval by Apergy's stockholders, approval by certain foreign regulatory authorities and receipt of opinions with respect to the tax-free nature of the transaction.

2. SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation

The consolidated financial statements include the accounts of the Company and all subsidiaries in which the Company has a controlling financial interest. Investments in companies, joint ventures or partnerships in which the Company does not have control but has the ability to exercise significant influence over operating and financial decisions, are reported using the equity method of accounting. The cost method of accounting is used in circumstances where the Company does not significantly influence the investee, and the investment has no readily determinable fair value. International subsidiaries are included in the financial statements on the basis of their U.S. GAAP November 30 fiscal year-ends to facilitate the timely inclusion of such entities in the Company's consolidated financial reporting. All intercompany transactions and profits are eliminated in consolidation.

Use of Estimates

The preparation of the Company's financial statements requires management to make certain estimates and assumptions that affect the reported amounts of assets and liabilities as of the date of the financial statements and the reported amounts of revenues and expenses during the reporting periods. Actual results could differ from these estimates. The Company's critical accounting estimates include revenue recognition, valuation allowances and accrued liabilities, actuarially determined liabilities, restructuring, income taxes, long-lived assets, intangible assets and goodwill.

Foreign Currency Translation

Financial position and reported results of operations of the Company's non-U.S. dollar functional currency international subsidiaries are measured using local currencies as the functional currency. Assets and liabilities of these operations are translated at the exchange rates in effect at each fiscal year end. The translation adjustments related to assets and liabilities that arise from changes in exchange rates from period to period are included in accumulated other comprehensive loss in shareholders' equity. Income statement accounts are translated at average rates of exchange prevailing during the year. As discussed in Note 18 Operating Segments and Geographic Information, the Company evaluates its international operations based on fixed rates of exchange; however, changes in exchange rates from period to period impact the amount of reported income from consolidated operations.

Concentration of Credit Risk

Credit risk represents the accounting loss that would be recognized at the reporting date if counterparties failed to perform as contracted. The Company believes the likelihood of incurring material losses due to concentration of credit risk is minimal. The principal financial instruments subject to credit risk are as follows:

Cash and Cash Equivalents - The Company maintains cash deposits with major banks, which from time to time may exceed insured limits. The possibility of loss related to financial condition of major banks has been deemed minimal. Additionally, the Company's investment policy limits exposure to concentrations of credit risk and changes in market conditions.

Accounts Receivable - A large number of customers in diverse industries and geographies, as well as the practice of establishing reasonable credit lines, limits credit risk. Based on historical trends and experiences, the allowance for doubtful accounts is adequate to cover potential credit risk losses.

Foreign Currency and Interest Rate Contracts and Derivatives - Exposure to credit risk is limited by internal policies and active monitoring of counterparty risks. In addition, the Company uses a diversified group of major international banks and financial institutions as counterparties. The Company does not anticipate nonperformance by any of these counterparties.

Cash and Cash Equivalents

Cash equivalents include highly-liquid investments with a maturity of three months or less when purchased.

Restricted Cash

Cash and cash equivalents that are restricted as to withdrawal or use under the terms of certain contractual agreements are recorded in Other assets on the Consolidated Balance Sheet and primarily relate to acquisition activities.

Accounts Receivable and Allowance for Doubtful Accounts

Accounts receivable are carried at the invoiced amounts, less an allowance for doubtful accounts, and generally do not bear interest. The Company estimates the balance of allowance for doubtful accounts by analyzing accounts receivable balances by age and applying historical write-off and collection trend rates. The Company's estimates separately considered specific circumstances and credit conditions of customer receivables, and whether it is probable balances will be collected. Account balances are written off against the allowance when it is determined the receivable will not be recovered.

The Company's allowance for doubtful accounts balance also includes an allowance for the expected return of products shipped and credits related to pricing or quantities shipped of \$18 million, \$17 million and \$15 million as of December 31, 2019, 2018, and 2017, respectively. Returns and credit activity is recorded directly as a reduction to revenue.

The following table summarizes the activity in the allowance for doubtful accounts:

(millions)	2019	2018	2017
Beginning balance	\$60.6	\$71.5	\$67.6
Bad debt expense	21.7	15.7	17.1
Write-offs	(19.1)	(23.6)	(15.7)
Other (a)	(1.2)	(3.0)	2.5
Ending balance	\$62.0	\$60.6	\$71.5

(a) Other amounts are primarily the effects of changes in currency translations and the impact of allowance for returns and credits.

Inventory Valuations

Inventories are valued at the lower of cost or net realizable value. Certain U.S. inventory costs are determined on a last-in, first-out ("LIFO") basis. LIFO inventories represented 37% of consolidated inventories as of December 31, 2019 and 2018. All other inventory costs are determined using either the average cost or first-in, first-out ("FIFO") methods. Inventory values at FIFO, as shown in Note 5, approximate replacement cost.

Property, Plant and Equipment

Property, plant and equipment assets are stated at cost. Merchandising and customer equipment consists principally of various dispensing systems for the Company's cleaning and sanitizing products, warewashing machines and process control and monitoring equipment. Certain dispensing systems capitalized by the Company are accounted for on a mass asset basis, whereby equipment is capitalized and depreciated as a group and written off when fully depreciated. The Company capitalizes both internal and external costs to develop or purchase computer software. Costs incurred for data conversion, training and maintenance associated with capitalized software are expensed as incurred. Expenditures for major renewals and improvements, which significantly extend the useful lives of existing plant and equipment, are capitalized and depreciated. Expenditures for repairs and maintenance are charged to expense as incurred. Upon retirement or disposition of plant and equipment, the cost and related accumulated depreciation are removed from the accounts and any resulting gain or loss is recognized in income.

Depreciation is charged to operations using the straight-line method over the assets' estimated useful lives ranging from 5 to 40 years for buildings and leasehold improvements, 3 to 20 years for machinery and equipment, 3 to 20 years for merchandising and customer equipment and 3 to 7 years for capitalized software. The straight-line method of depreciation reflects an appropriate allocation of the cost of the assets to earnings in proportion to the amount of economic benefits obtained by the Company in each reporting period. Depreciation expense was \$654 million, \$621 million and \$586 million for 2019, 2018 and 2017, respectively.

During 2019 and 2018, the Company impaired certain assets as part of a restructuring program. During 2017, the Company impaired certain assets related to a portion of one of its businesses. See Note 3 for additional information regarding these asset impairments.

Goodwill and Other Intangible Assets

Goodwill

Goodwill represents the excess of the purchase price over the fair value of identifiable net assets acquired in a business combination. The Company's reporting units are its operating segments.

During the second quarter of 2019, the Company completed its annual assessment for goodwill impairment across its eleven reporting units through a two-step quantitative analysis, utilizing a discounted cash flow approach, which incorporates assumptions regarding future growth rates, terminal values, and discount rates. The first step involves estimating the fair value of each reporting unit and comparing them to the respective carrying values, including goodwill. If the fair value of a reporting unit exceeds its carrying value, goodwill of the reporting unit is considered not to be impaired, and the second step of the impairment test is unnecessary. If the carrying amount of the reporting unit exceeds its fair value, the second step of the goodwill impairment test would be performed to measure the amount of impairment loss to be recorded, if any. The Company's goodwill impairment assessment for 2019 indicated the estimated fair value of each of its reporting units exceeded its carrying amount by a significant margin. Additionally, no events occurred during the second half of 2019 that indicated a need to update the Company's conclusions reached during the second quarter of 2019.

If significant events or circumstances are identified that indicate it is more likely than not that the fair value of a reporting unit is less than its carrying value, the Company will test a reporting unit's goodwill for impairment during interim periods between its annual tests. There has been no impairment of goodwill in any of the years presented.

The changes in the carrying amount of goodwill for each of the Company's reportable segments are as follows:

(millions)	Global Industrial	Global Institutional	Global Energy	Other	Total
December 31, 2017	\$2,725.3	\$1,027.0	\$3,203.7	\$211.1	\$7,167.1
Current year business combinations (a)	71.6	12.4	-	-	84.0
Prior year business combinations (b)	(1.2)	-	-	(0.9)	(2.1)
Dispositions	(0.5)	-	(2.9)	-	(3.4)
Effect of foreign currency translation	(64.4)	(24.1)	(74.2)	(4.9)	(167.6)
December 31, 2018	\$2,730.8	\$1,015.3	\$3,126.6	\$205.3	\$7,078.0
Current year business combinations (a)	92.2	142.1	-	0.7	235.0
Prior year business combinations (b)	(0.2)	-	-	-	(0.2)
Effect of foreign currency translation	(23.6)	(9.7)	(26.1)	(1.7)	(61.1)
December 31, 2019	\$2,799.2	\$1,147.7	\$3,100.5	\$204.3	\$7,251.7

- (a) For 2019, \$49.4 million of the goodwill related to businesses acquired is expected to be tax deductible. For 2018, the Company does not expect any of the goodwill related to businesses acquired to be tax deductible.
- (b) Represents purchase price allocation adjustments for acquisitions deemed preliminary as of the end of the prior year.

Other Intangible Assets

The Nalco trade name is the Company's principal indefinite life intangible asset. During the second quarter of 2019, the Company completed its annual indefinite life intangible asset impairment assessment using a relief from royalty method approach, which incorporates assumptions regarding future sales projections, royalty rates and discount rates. Based on this testing, the estimated fair value of the asset exceeded its carrying value by a significant margin, therefore, no adjustment to the \$1.2 billion carrying value of this asset was necessary. Additionally, no events during the second half of 2019 indicated a need to update the Company's conclusions reached during the second quarter of 2019. There has been no impairment of the Nalco trade name intangible asset since it was acquired.

The Company's intangible assets subject to amortization primarily include customer relationships, trademarks, patents and other technology recognized at fair value from the Company's business combinations. The fair value of identifiable intangible assets is estimated at acquisition using discounted cash flow approaches or other acceptable valuation methods. Other intangible assets are amortized on a straight-line basis over their estimated economic lives. The weighted-average useful life of amortizable intangible assets was 14 years as of both December 31, 2019 and 2018.

The weighted-average useful life by type of amortizable asset at December 31, 2019 is as follows:

(years)	
Customer relationships	14
Trademarks	13
Patents	14
Other technology	5

The straight-line method of amortization reflects an appropriate allocation of the cost of the intangible assets to earnings in proportion to the amount of economic benefits obtained by the Company in each reporting period. The Company evaluates the remaining useful life of its intangible assets that are being amortized each reporting period to determine whether events and circumstances warrant a change to the estimated remaining period of amortization. If the estimate of an intangible asset's remaining useful life is changed, the remaining carrying amount of the intangible asset will be amortized prospectively over the revised remaining useful life. Total amortization expense related to other intangible assets during the last three years and future estimated amortization is as follows:

(millions)	
2017	\$ 308
2018	317
2019	319
2020	320
2021	316
2022	309
2023	302
2024	289

Long-Lived Assets

The Company reviews its long-lived and amortizable intangible assets for impairment when significant events or changes in business circumstances indicate that the carrying value of the assets may not be recoverable. Such circumstances may include a significant decrease in the market price of an asset, a significant adverse change in the manner in which the asset is being used or in its physical condition or history of operating or cash flow losses associated with the use of an asset. An impairment loss may be recognized when the carrying amount of an asset exceeds the anticipated future undiscounted cash flows expected to result from the use of the asset and its eventual disposition. The amount of the impairment loss to be recorded, if any, is calculated by the excess of the asset's carrying value over its fair value.

In addition, the Company periodically reassesses the estimated remaining useful lives of its long-lived assets. Changes to estimated useful lives would impact the amount of depreciation and amortization recorded in earnings. The Company has not experienced significant changes in the carrying value or estimated remaining useful lives of its long-lived or amortizable intangible assets.

Rental and Leases

Lessee

The Company determines whether a lease exists at the inception of the arrangement. In assessing whether a contract is or contains a lease, the Company considers a lease a contract that conveys the right to control the use of an identified asset for a period of time in exchange for consideration. The Company accounts for lease components separately from the nonlease components (e.g., common-area maintenance costs). Operating leases are recorded in operating lease assets, other current liabilities and operating lease liabilities in the Consolidated Balance Sheet.

Operating lease assets and operating lease liabilities are measured and recognized based on the present value of the future minimum lease payments over the lease term at commencement date. The Company uses the rate implicit in the lease when available or determinable. When the rate implicit in the lease is not determinable, the Company uses its incremental borrowing rate based on the information available at commencement date to determine the present value of future payments. Lease expense for minimum lease payments is recognized on a straight-line basis over the lease term. Variable lease payments are not included in the lease liability and are recognized as incurred. The Company identified real estate, vehicles and other equipment as the primary classes of leases. Certain leases with a similar class of underlying assets are accounted for as a portfolio of leases.

The Company does not record operating lease assets or liabilities for leases with terms of twelve months or less. Those lease payments will continue to be recognized in the Consolidated Statement of Income on a straight-line basis over the lease term.

Most leases include one or more options to renew, which is at the Company's sole discretion, with renewal terms that can extend the lease term from one month to multiple years. The lease start date is when the asset is available for use and in possession of the Company. The lease end date, which includes any options to renew that are reasonably certain to be exercised, is based on the terms of the contract. The depreciable life of assets and leasehold improvements are limited by the expected lease term, unless there is a transfer of title or purchase option reasonably certain of exercise. The Company's lease agreements do not contain any material restrictive covenants.

Lessor

The Company accounts for lease and nonlease components separately. The nonlease components, such as product and service revenue, are accounted for under Topic 606 Revenue from Contracts with Customers, refer to Note 17 for more information. Revenue from leasing equipment is recognized on a straight-line basis over the life of the lease. Cost of sales includes the depreciation expense for assets under operating leases. The assets are depreciated over their estimated useful lives. Initial lease terms range from one year to five years and most leases include renewal options.

Lease contracts convey the right for the customer to control the equipment for a period of time as defined by the contract. There are no options for the customer to purchase the equipment and therefore the equipment remains the property of the Company at the end of the lease term. See Note 13 for additional information regarding rental and leases.

Income Taxes

Income taxes are recognized during the period in which transactions enter into the determination of financial statement income, with deferred income taxes provided for the tax effect of temporary differences between the carrying amount of assets and liabilities and their tax bases. The Company records a valuation allowance to reduce its deferred tax assets when uncertainty regarding their realizability exists. The Company records liabilities for income tax uncertainties in accordance with the U.S. GAAP recognition and measurement criteria guidance.

On December 22, 2017, the Tax Cuts and Jobs Act (the "Act") was enacted, which reduced the U.S. federal corporate tax rate from 35% to 21%, requires companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and creates new taxes on certain foreign sourced earnings. The Tax Act added many new provisions including changes to bonus depreciation, the deduction for executive compensation and interest expense, a tax on global intangible low taxed income (GILTI), the base erosion anti abuse tax (BEAT) and a deduction for foreign derived intangible income (FDII). The Company has elected the period cost method and considers the estimated GILTI impact in tax expense beginning in 2018. See Note 12 for additional information regarding income taxes.

Share-Based Compensation

The Company measures compensation expense for share-based awards at fair value at the date of grant and recognizes compensation expense over the service period for awards expected to vest. The majority of grants to retirement eligible recipients (age 55 with required years of service) are recorded to expense using the non-substantive vesting method and are fully expensed over a six-month period following the date of grant. In addition, the Company includes a forfeiture estimate in the amount of compensation expense being recognized based on an estimate of the number of outstanding awards expected to vest.

All excess tax benefits or deficiencies are recognized as discrete income tax items on the Consolidated Statement of Income. The Company recorded \$43.1 million, \$28.1 million and \$39.7 million of excess tax benefits during 2019, 2018 and 2017, respectively. The extent of excess tax benefits is subject to variation in stock price and stock option exercises. See Note 11 for additional information regarding equity compensation plans.

Restructuring Activities

The Company's restructuring activities are associated with plans to enhance its efficiency, effectiveness and sharpen its competitiveness. These restructuring plans include net costs associated with significant actions involving employee-related severance charges, contract termination costs and asset write-downs and disposals. Employee termination costs are largely based on policies and severance plans, and include personnel reductions and related costs for severance, benefits and outplacement services. These charges are reflected in the quarter in which the actions are probable and the amounts are estimable, which typically is when management approves the associated actions. Contract termination costs include charges to terminate leases prior to the end of their respective terms and other contract termination costs. Asset write-downs and disposals include leasehold improvement write-downs, other asset write-downs associated with combining operations and disposal of assets. See Note 3 for additional information regarding restructuring activities.

Revenue Recognition

Revenue is measured as the amount of consideration expected to be received in exchange for transferring goods or providing service.

Product and Sold Equipment

Revenue from product and sold equipment is recognized when obligations under the terms of a contract with the customer are satisfied, which generally occurs with the transfer of the product or delivery of the equipment.

Service and Lease Equipment

Revenue from service and leased equipment is recognized when the services are provided, or the customer receives the benefit from the leased equipment, which is over time. Service revenue is recognized over time utilizing an input method and aligns with when the services are provided. Typically, revenue is recognized using costs incurred to date because the effort provided by the field selling and service organization represents services provided, which corresponds with the transfer of control. Revenue for leased equipment is accounted for under Topic 842 Leases and recognized on a straight-line basis over the length of the lease contract.

Other Considerations

Contracts with customers may include multiple performance obligations. For contracts with multiple performance obligations, the consideration is allocated between products and services based on their stand-alone selling prices. Stand-alone selling prices are generally based on the prices charged to customers or using an expected cost plus margin. Judgment is used in determining the amount of service that is embedded within the contracts, which is based on the amount of time spent on the performance obligation activities. The level of effort, including the estimated margin that would be charged, is used to determine the amount of service revenue. Depending on the terms of the contract, the Company may defer the recognition of revenue when a future performance obligation has not yet occurred.

Taxes assessed by a governmental authority that are both imposed on and concurrent with a specific revenue-producing transaction, which are collected by the Company from a customer, are excluded from revenue. Shipping and handling costs associated with outbound freight are recognized in cost of sales when control over the product has transferred to the customer.

Other estimates used in recognizing revenue include allocating variable consideration to customer programs and incentive offerings, including pricing arrangements, promotions and other volume-based incentives at the time the sale is recorded. These estimates are based primarily on historical experience and anticipated performance over the contract period. Based on the certainty in estimating these amounts, they are included in the transaction price of the contracts and the associated remaining performance obligations. The Company recognizes revenue when collection of the consideration expected to be received in exchange for transferring goods or providing services is probable.

The Company's revenue policies do not provide for general rights of return. Estimates used in recognizing revenue include the delay between the time that products are shipped and when they are received by customers, when title transfers and the amount of credit memos issued in subsequent periods. Depending on market conditions, the Company may increase customer incentive offerings, which could reduce gross profit margins over the term of the incentive.

Earnings Per Common Share

The difference in the weighted average common shares outstanding for calculating basic and diluted earnings attributable to Ecolab per common share is a result of the dilution associated with the Company's equity compensation plans. As noted in the table below, certain stock options and units outstanding under these equity compensation plans were not included in the computation of diluted earnings attributable to Ecolab per common share because they would not have had a dilutive effect.

The computations of the basic and diluted earnings attributable to Ecolab per share amounts were as follows:

(millions, except per share)	2019	2018	2017
Net income attributable to Ecolab	\$1,558.9	\$1,429.1	\$1,504.6
Weighted-average common shares outstanding			
Basic	288.1	288.6	289.6
Effect of dilutive stock options and units	4.4	4.2	4.4
Diluted	292.5	292.8	294.0
Basic EPS	\$ 5.41	\$ 4.95	\$ 5.20
Diluted EPS	\$ 5.33	\$ 4.88	\$ 5.12
Anti-dilutive securities excluded from the computation of diluted EPS	1.1	2.9	3.4

Amounts do not necessarily sum due to rounding.

Other Significant Accounting Policies

The following table includes a reference to additional significant accounting policies that are described in other notes to the financial statements, including the note number:

Policy	Note
Fair value measurements	7
Derivatives and hedging transactions	8
Share-based compensation	11
Research and development expenditures	14
Legal contingencies	15
Pension and post-retirement benefit plans	16
Reportable segments	18

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New Accounting Pronouncements

Standards that are not yet adopted:

Standard	Date of Issuance	Description	Required Date of Adoption	Effect on the Financial Statements
ASU 2019-12 - Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes	December 2019	Simplifies the accounting for income taxes by removing certain exceptions to the general principles in Topic 740 Income Taxes related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and recognition of deferred tax liabilities for outside basis difference. The new standard also simplifies the accounting for franchise taxes and enacted changes in tax laws or rates and clarifies the accounting for transactions that result in a step-up in the basis of goodwill.	January 1, 2021	The Company is currently evaluating the impact of adoption.
ASU 2018-15 - Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract (a consensus of the FASB Emerging Issues Task Force)	August 2018	Aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The amendments require an entity (customer) in a hosting arrangement that is a service contract to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense.	January 1, 2020	The Company is anticipating adopting the ASU prospectively. Adoption of the ASU is not expected to have a material impact on the Company's financial statements.
ASU 2018-14 - Compensation - Retirement Benefits - Defined Benefit Plans - General (Subtopic 715-20): Disclosure Framework - Changes to the Disclosure Requirements for Defined Benefit Plans	August 2018	Modifies disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans. This includes, but is not limited to, the removal of the requirement to disclose the amounts in accumulated other comprehensive income expected to be recognized as components of net periodic benefit cost over the next fiscal year, and the addition of a requirement to disclose the weighted-average interest crediting rates for cash balance plans and other plans with promised interest crediting rates.	January 1, 2020	The new disclosure requirements are applied on a retrospective basis to all periods presented. Adoption of the ASU is not expected to have a material impact on the Company's financial statements.
ASU 2017-04 - Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment	January 2017	Simplifies subsequent measurement of goodwill by eliminating Step 2 from the goodwill impairment test. Step 2 measures a goodwill impairment loss by comparing the implied fair value of a reporting unit's goodwill with the carrying amount of that goodwill.	January 1, 2020	The ASU must be applied on a prospective basis upon adoption. As described in Note 2 the Company has passed Step 1 of its annual impairment assessment, accordingly, adoption of the ASU is not expected to have a material impact on the Company's financial statements when completing future impairment analyses.
Credit Losses ASUs: ASU 2019-11 - Codification Improvements to Topic 326, Financial Instruments - Credit Losses ASU 2019-05 - Financial Instruments - Credit Losses (Topic 326): Targeted Transition Relief ASU 2018-19 - Codification Improvements to Topic 326, Financial Instruments - Credit Losses ASU 2016-13 - Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments	Various	Addresses the recognition, measurement, presentation and disclosure of credit losses on trade and reinsurance receivables, loans, debt securities, net investments in leases, off-balance-sheet credit exposures and certain other instruments. Amends guidance on reporting credit losses from an incurred model to an expected model for assets held at amortized cost, such as accounts receivable, loans and held-to-maturity debt securities. Additional disclosures will also be required.	January 1, 2020	The Company has identified the financial assets to primarily include trade and notes receivable. The Company is updating current accounting policies to be in accordance with the new standard, and the impact of adoption is not expected to be material to the Company's financial statements.

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Standards that were adopted:

Standard	Date of Issuance	Description	Date of Adoption	Effect on the Financial Statements
ASU 2018-02 - Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income	February 2018	Allows entities to reclassify stranded tax effects resulting from the Tax Cut and Jobs Act ("the Act") from accumulated other comprehensive income to retained earnings. Tax effects stranded in other comprehensive income for reasons other than the impact of the Act cannot be reclassified.	January 1, 2019	In order to improve the usefulness and transparency, the Company made the election to reclassify \$61.2 million of income tax effects of the Tax Cuts and Jobs Act from accumulated other comprehensive income to retained earnings related to pension and derivatives.
ASU 2018-16 - Derivatives and Hedging (Topic 815): Inclusion of the Secured Overnight Financing Rate (SOFR) Overnight Index Swap (OIS) Rate as a Benchmark Interest Rate for Hedge Accounting Purposes ASU 2017-12 - Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities	Various	Amends the hedge accounting recognition and presentation requirements. Simplifies the application of hedge accounting and the requirements for hedge documentation and effectiveness testing. Requires presentation of all items that affect earnings in the same income statement line as the hedged item. Expands the benchmark interest rates that can be used for hedge accounting.	January 1, 2019	Adoption of this guidance did not have a material impact on the results of operations, financial position or cash flows. Required disclosures under the new guidance are included in Note 8.
Lease ASUs: ASU 2019-01 - Leases (Topic 842): Codification Improvements ASU 2018-20 - Leases (Topic 842): Narrow-Scope Improvements for Lessors ASU 2018-11 - Leases (Topic 842) Targeted Improvements ASU 2018-10 - Codification Improvements to Topic 842, Leases ASU 2018-01 - Leases (Topic 842): Land Easement Practical Expedient ASU 2016-02 - Leases (Topic 842)	Various	Introduces the recognition of lease assets and lease liabilities by lessees for those leases classified as operating leases under previous guidance.	January 1, 2019	See additional information regarding the impact of this guidance on the Company's financial statements at the bottom of this table in note (a).

No other new accounting pronouncement issued or effective has had or is expected to have a material impact on the Company's consolidated financial statements.

(a) Leases

On January 1, 2019, the Company adopted Topic 842 Leases ("the new lease standard") prospectively and recorded a cumulative effect adjustment to the opening balance of retained earnings of \$2.8 million. The Company elected the package of practical expedients permitted under the transition guidance within the new lease standard, which allows the Company to carryforward the historical lease classification, to not reassess whether existing contracts are or contain a lease and not to reassess initial direct costs. The Company also elected the land easement practical expedient.

In addition, the Company elected the hindsight practical expedient to determine the lease term for existing leases. When applying the hindsight expedient, the Company determined that it was not reasonably certain that most renewal options would be exercised and therefore the Company did not include the renewal period in our determination of the expected lease term. The Company made an accounting policy election to not apply the recognition requirements of the new standard to leases with terms of twelve months or less and which do not include an option to purchase the underlying assets which is reasonably certain of exercise.

Adoption of the new standard resulted in the recording of additional net operating lease assets and operating lease liabilities of \$572.2 million and \$575.0 million, respectively, as of January 1, 2019. The difference between the operating lease assets and operating lease liabilities was recorded as an adjustment to retained earnings. There was no impact to consolidated net earnings or cash flows. Further information related to the Company's adoption of the new lease standard is included in Note 13.

3. SPECIAL (GAINS) AND CHARGES

Special (gains) and charges reported on the Consolidated Statement of Income included the following:

(millions)	2019	2018	2017
Cost of sales			
Restructuring activities	\$20.4	\$12.1	\$4.6
Acquisition and integration activities	7.6	(0.6)	13.2
Other	10.5	(2.2)	26.2
Cost of sales subtotal	38.5	9.3	44.0
Special (gains) and charges			
Restructuring activities	116.8	89.4	39.9
ChampionX separation	77.3	-	-
Acquisition and integration activities	5.6	8.8	15.4
Gain on sale of business	-	-	(46.1)
Venezuela related gain	-	-	(11.5)
Other	11.9	28.5	(1.4)
Special (gains) and charges subtotal	211.6	126.7	(3.7)
Operating income subtotal	250.1	136.0	40.3
Interest expense, net	0.2	0.3	21.9
Other (income) expense	9.5	-	-
Total special (gains) and charges	\$259.8	\$136.3	\$62.2

For segment reporting purposes, special (gains) and charges are not allocated to reportable segments, which is consistent with the Company's internal management reporting.

Restructuring Activities

Restructuring activities in 2019 and 2018 are primarily related to Accelerate 2020 (described below). Restructuring activities have been included as a component of both cost of sales and special (gains) and charges on the Consolidated Statement of Income. Restructuring liabilities have been classified as a component of other current and other noncurrent liabilities on the Consolidated Balance Sheet.

Accelerate 2020

During the third quarter of 2018, the Company formally commenced a restructuring plan Accelerate 2020 ("the Plan"), to leverage technology and systems investments and organizational changes. During the first quarter of 2019, the Company raised its goals for the Plan to simplify and automate processes and tasks, reduce complexity and management layers, consolidate facilities and focus on key long-term growth areas by leveraging technology and structural improvements. The Company expects that the restructuring activities will be completed by the end of 2020, with anticipated costs of \$260 million (\$200 million after tax) over this period of time. Costs are expected to be primarily cash expenditures for severance costs and some facility closure costs relating to team reorganizations. Actual costs may vary from these estimates depending on actions taken.

The Company recorded restructuring charges of \$136.6 million (\$104.4 million after tax) and \$104.6 million (\$79.6 million after tax) in 2019 and 2018, respectively, primarily related to severance. Of these expenses, \$2.0 million (\$1.5 million after tax) is recorded in other income expense and related to pension settlements and curtailments. The liability related to this Restructuring Plan was \$104.0 million and \$63.9 million as of December 31, 2019 and 2018, respectively. The Company has recorded \$241.2 million (\$184.0 million after tax) of cumulative restructuring charges under the Plan.

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Restructuring activity related to the Plan since inception of the underlying actions includes the following:

(millions)	Employee Termination Costs	Asset Disposals	Other	Total
2018 Activity				
Recorded expense	\$94.1	\$5.0	\$5.5	\$104.6
Net cash payments	(32.8)	-	(2.4)	(35.2)
Non-cash charges	-	(5.0)	-	(5.0)
Effect of foreign currency translation	(0.5)	-	-	(0.5)
Restructuring liability, December 31, 2018	60.8	-	3.1	63.9
2019 Activity				
Recorded expense	122.0	0.2	14.4	136.6
Net cash payments	(79.8)	1.2	(14.0)	(92.6)
Non-cash charges	-	(1.4)	(2.0)	(3.4)
Effect of foreign currency translation	(0.5)	-	-	(0.5)
Restructuring liability, December 31, 2019	\$102.5	\$-	\$1.5	\$104.0

Other Restructuring Activities

During 2019, the Company incurred restructuring charges of \$4.1 million (\$3.3 million after tax) related to an immaterial restructuring plan. The charges are comprised of severance, facility closure costs, including asset disposals and consulting fees. Prior to 2018, the Company engaged in a number of restructuring plans. During 2017, the Company commenced restructuring and other cost-saving actions in order to streamline operations. These actions include a reduction of the Company's global workforce, as well as asset disposals and lease terminations. Actions were substantially completed in 2017. The Company also has restructuring plans that commenced prior to 2016. During 2019, net restructuring gains related to prior year plans were \$1.5 million (\$1.1 million after tax). During 2018, net restructuring gains related to prior year plans were \$3.1 million (\$2.4 million after tax). The gains recorded were due to finalizing estimates upon completion of projects. During 2017, the Company recorded restructuring charges of \$44.5 million (\$32.3 million after tax).

The restructuring liability balance for all plans excluding Accelerate 2020 was \$7.7 million and \$14.9 million as of December 31, 2019 and 2018, respectively. The reduction in liability was driven primarily by severance payments. The remaining liability is expected to be paid over a period of a few months to several quarters and will continue to be funded from operating activities. Cash payments during 2019 related to these restructuring plans were \$8.3 million.

ChampionX Separation

On December 18, 2019, the Company entered into definitive agreements with ChampionX and Apergy pursuant to which the Company will separate the Upstream Energy business of its Global Energy segment and combine it with Apergy in a tax-efficient reverse Morris Trust transaction. During 2019, the charges associated with the separation reported in special (gains) and charges on the Consolidated Statement of Income include \$77.3 million (\$65.8 million after tax), which are primarily related to professional fees to support the separation. ChampionX separation costs reported in other income expense on the Consolidated Statement of Income in 2019 include \$7.5 million (\$5.7 million after tax), related to pension settlements and curtailments due to the separation.

Acquisition and integration related costs

Acquisition and integration costs reported in special (gains) and charges on the Consolidated Statement of Income in 2019 include \$5.6 million (\$4.1 million after tax). Charges are related to the Bioquell, PLC ("Bioquell") and the Laboratoires Anios ("Anios") acquisition and consist of integration costs, advisory and legal fees. Acquisition and integration costs reported in product and equipment cost of sales on the Consolidated Statement of Income in 2019 include \$7.6 million (\$5.6 million after tax) and are related to recognition of fair value step-up in the Bioquell inventory and facility closure costs. In conjunction with its acquisitions, the Company incurred \$0.2 million (\$0.1 million after tax) of interest expense in 2019.

During 2018, acquisition and integration costs reported in special (gains) and charges on the Consolidated Statement of Income included \$8.8 million (\$6.1 million after tax). Charges are primarily related to Anios integration costs, advisory and legal fees. The acquisition and integration gain reported in product and equipment cost of sales on the Consolidated Statement of Income in 2018 relate to changes in estimates related to an early lease exit. In conjunction with its acquisitions, the Company incurred \$0.3 million (\$0.2 million after tax) of interest expense in 2018.

During 2017, acquisition and integration costs reported in special (gains) and charges on the Consolidated Statement of Income included \$15.4 million (\$9.9 million after tax) of acquisition costs, advisory and legal fees, and integration charges for the Anios and Swisher acquisitions. Acquisition and integration costs reported in cost of sales on the Consolidated Statement of Income in 2017 included \$13.2 million (\$8.6 million after tax) related primarily to disposal of excess inventory upon the closure of Swisher plants, accelerated rent expense, and amounts related to recognition of fair value step up in the Anios inventory. Further information related to the Company's acquisitions is included in Note 4.

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Gain on sale of business

During 2017, the Company disposed of the Equipment Care business and recorded a gain of \$46.1 million (\$12.4 million after tax primarily due to non-deductible goodwill) net of working capital adjustments, costs to sell and other transaction expenses. The gain has been included as a component of special (gains) and charges on the Consolidated Statement of Income.

Venezuela related activities

Effective as of the end of the fourth quarter of 2015, the Company deconsolidated its Venezuelan subsidiaries. The Company recorded gains due to U.S. dollar cash recoveries of intercompany receivables written off at the time of deconsolidation of \$11.5 million (\$7.2 million after tax) in 2017. No such gains occurred in 2019 or 2018.

Other

During 2019, the Company recorded other special charges of \$11.9 million (\$7.5 million after tax) which primarily related to legal charges partially offset by a litigation settlement. Other special charges reported in product and equipment cost of sales on the Consolidated Statement of Income in 2019 of \$10.5 million (\$7.1 million after tax) relate to a Healthcare product recall in Europe.

During 2018, the Company recorded other special charges of \$28.5 million (\$21.5 million after tax) which primarily consisted of a \$25.0 million (\$18.9 million after tax) commitment to the Ecolab Foundation. Other charges, primarily litigation related charges, were minimal and have been included as a component of special (gains) and charges on the Consolidated Statement of Income. Other special gains reported in product and equipment cost of sales on the Consolidated Statement of Income in 2018 of \$2.2 million (\$1.7 million after tax) relate to changes in estimates for an inventory LIFO reserve.

During 2017, the Company recorded other charges of \$24.8 million (\$19.0 million after tax), primarily related to fixed asset impairments, a Global Energy vendor contract termination and litigation related charges. These charges have been included as a component of both cost of sales and special (gains) and charges on the Consolidated Statement of Income.

Other (Income) Expense

During 2019, the Company recorded other expense of \$9.5 million (\$7.2 million after tax) related to pension curtailments and settlements due to the ChampionX separation and Accelerate 2020, respectively, as discussed further above. These charges have been included as a component of other income expense on the Consolidated Statement of Income.

Interest Expense, net

During 2019 and 2018, an immaterial amount of interest expense was recorded due to acquisition and integration costs.

During 2017, in anticipation of U.S. tax reform and a potential limit on interest deductibility in future years, the Company entered into transactions to exchange or retire certain long-term debt, and incurred debt exchange and extinguishment charges of \$21.9 million (\$13.6 million after tax). This charge has been included as a component of interest expense, net on the Consolidated Statement of Income.

4. ACQUISITIONS AND DISPOSITIONS

Acquisitions

The Company makes business acquisitions that align with its strategic business objectives. The assets and liabilities of the acquired businesses have been recorded as of the acquisition date, at their respective fair values, and are included in the Consolidated Balance Sheet. The purchase price allocation is based on estimates of the fair value of assets acquired and liabilities assumed. The aggregate purchase price of acquisitions has been reduced for any cash or cash equivalents acquired with the acquisition. Acquisitions during 2019, 2018 and 2017 were not significant to the Company's consolidated financial statements; therefore, pro forma financial information is not presented.

2019 Activity

During 2019, the Company acquired Bioquell, a life sciences business which sells bio-decontamination products and services to the Life Sciences and Healthcare industries. This business became part of the Global Industrial reportable segment. During 2018, the Company deposited \$179.3 million (£140.5 million) in an escrow account that was released upon closing of the transaction in February 2019. As shown within Note 5, this was recorded as restricted cash within other assets on the Consolidated Balance Sheet as of December 31, 2018.

The Company also acquired Lobster Ink, a leading provider of end-to-end online customer training solutions. This acquired business became part of the Global Institutional reportable segment. The purchase price included an earn-out based on certain revenue thresholds in any of the full three years following the acquisition. The acquisition date fair value of the earn-out was reflected in the overall purchase consideration exchanged for the acquisition and recorded as contingent consideration. The earn-out has not yet been paid or settled and the contingent consideration liability is recorded within other liabilities as of December 31, 2019.

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The Company also acquired Chemstar Corporation, a leading provider of cleaning and sanitizing products for the retail industry with a focus on cleaning chemicals and food safety. This acquired business became part of the Global Institutional reportable segment.

The Company also acquired Gallay Medical & Scientific which sells, installs, and services medical equipment and associated chemistry primarily for hospitals, healthcare facilities, and dental clinics. The acquired business became part of the Global Institutional reportable segment.

Purchase accounting for these transactions is not yet complete pending finalization of certain estimated values. The amounts recorded reflect the Company's best estimates as of December 31, 2019 and are subject to change. Annualized pre-acquisition sales for the businesses acquired in 2019 were \$134 million.

There were insignificant purchase price adjustments related to prior year acquisitions.

2018 Activity

During 2018, the Company acquired a water business which provides a range of services to Nalco Water institutional customers. This acquired business became part of the Company's Global Industrial reportable segment. In addition, the Company acquired an institutional business which provides a range of cleaning and disinfection products for the hospitality, leisure, residential care, housekeeping and janitorial sectors. These acquisitions have been accounted for using the acquisition method of accounting. In addition, there were insignificant purchase price adjustments related to prior year acquisitions.

2017 Activity

In 2017, the Company acquired a business which provides water solutions to automotive customers and a paper chemicals business. These businesses became part of the Company's Global Industrial reportable segment. Also in 2017, the Company acquired U.S. based pest elimination businesses that provide specialized capabilities in food storage. These businesses became part of the Company's Other reportable segment. Additional acquisitions were made during the year which became part of the Company's Global Energy and Global Industrial reportable segments. Annualized pre-acquisition sales of the businesses acquired were approximately \$135 million.

Acquisitions

The components of the cash paid for other acquisitions, excluding the Anios transaction (as further disclosed below), for transactions during 2019, 2018 and 2017, are shown in the following table.

(millions)	2019	2018	2017
Net tangible assets (liabilities) acquired and equity method investments	\$(8.0)	\$30.1	\$29.8
Identifiable intangible assets			
Customer relationships	115.7	101.5	67.0
Trademarks	24.1	3.9	2.5
Non-compete agreements	-	2.6	0.2
Other technology	48.9	6.5	7.6
Total intangible assets	188.7	114.5	77.3
Goodwill	234.8	81.9	87.4
Total aggregate purchase price	415.5	226.5	194.5
Acquisition-related liabilities and contingent considerations	(24.1)	(1.5)	5.6
Net cash paid for acquisitions, including acquisition-related liabilities and contingent considerations	\$391.4	\$225.0	\$200.1

The 2019 and 2018 acquisition-related liabilities primarily consist of holdback liabilities and contingent considerations. 2017 acquisition-related liabilities are related primarily to payments of settled liabilities from previous transactions.

The weighted average useful lives of identifiable intangible assets acquired, excluding the Anios transaction were, 12, 13, and 12 years as of December 31, 2019, 2018 and 2017, respectively.

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Anios Acquisition

On February 1, 2017, the Company acquired Anios for total consideration of \$798.3 million, including satisfaction of outstanding debt. Anios had annualized pre-acquisition sales of approximately \$245 million and is a leading European manufacturer and marketer of hygiene and disinfection products for the healthcare, food service, and food and beverage processing industries. Anios provides an innovative product line that expands the solutions the Company is able to offer, while also providing a complementary geographic footprint within the healthcare market. During 2016, the Company deposited €50 million in an escrow account that was released back to the Company upon closing of the transaction in February 2017. This was recorded as restricted cash within other assets on the Consolidated Balance Sheet as of December 31, 2016.

The Company incurred certain acquisition and integration costs associated with the transaction that were expensed and are reflected in the Consolidated Statement of Income. See Note 3 for additional information related to the Company's special (gains) and charges related to such activities.

The components of the cash paid for Anios are shown in the following table.

(millions)	2017
Tangible assets	\$139.8
Identifiable intangible assets	
Customer relationships	252.0
Trademarks	65.7
Other technology	16.1
Total assets acquired	473.6
Goodwill	511.7
Total liabilities	187.0
Total consideration transferred	798.3
Long-term debt repaid upon close	192.8
Net consideration transferred to sellers	\$605.5

Tangible assets are primarily comprised of accounts receivable of \$64.8 million, property, plant and equipment of \$24.7 million and inventory of \$29.1 million. Liabilities primarily consist of deferred tax liabilities of \$102.3 million and current liabilities of \$62.5 million.

Customer relationships, trademarks and other technology are being amortized over weighted average lives of 20, 17, and 11 years, respectively.

Goodwill of \$511.7 million arising from the acquisition consists largely of the synergies and economies of scale expected through adding complementary geographies and innovative products to the Company's healthcare portfolio. The goodwill was allocated to the Institutional, Healthcare, and Specialty operating segments within the Global Institutional reportable segment and the Food & Beverage and Life Sciences operating segments within the Global Industrial reportable segment. None of the goodwill recognized is expected to be deductible for income tax purposes.

Dispositions

In November 2017, the Company completed the sale of its Equipment Care business to a third party for \$132.6 million, net of working capital adjustments, costs to sell and other transaction expenses. Prior to its sale, Equipment Care provided equipment repair, maintenance, and preventative maintenance services for the commercial food service industry. Consideration received consisted of \$118.8 million of cash, a note receivable of \$15.0 million and a \$5.0 million equity interest in the acquiring entity. The Company recognized a gain of \$46.1 million (\$12.4 million after tax, primarily due to non-deductible goodwill), which is recorded in special (gains) and charges in the Consolidated Statement of Income. Equipment Care sales were approximately \$180 million in 2016 and were included in Other.

No dispositions were significant to the Company's consolidated financial statements for 2019, 2018 or 2017.

Subsequent Event Activity

Subsequent to year-end, the Company reached an agreement to purchase CID Lines, a leading provider of livestock biosecurity and hygiene solutions. The acquisition is expected to close in the second quarter of 2020 subject to various regulatory clearances.

5. BALANCE SHEET INFORMATION

(millions)	December 31 2019	December 31 2018
Accounts receivable, net		
Accounts receivable	\$2,858.5	\$2,723.1
Allowance for doubtful accounts	(62.0)	(60.6)
Total	\$2,796.5	\$2,662.5
Inventories		
Finished goods	\$936.5	\$1,016.9
Raw materials and parts	559.8	525.6
Inventories at FIFO cost	1,496.3	1,542.5
FIFO cost to LIFO cost difference	9.3	3.9
Total	\$1,505.6	\$1,546.4
Other current assets		
Prepaid assets	\$118.8	\$132.1
Taxes receivable	133.7	144.2
Derivative assets	54.3	42.8
Other	33.1	35.0
Total	\$339.9	\$354.1
Property, plant and equipment, net		
Land	\$215.1	\$214.5
Buildings and leasehold improvements	1,363.1	1,279.4
Machinery and equipment	2,467.8	2,313.7
Merchandising and customer equipment	2,787.8	2,565.5
Capitalized software	779.7	666.2
Construction in progress	406.7	400.2
Total	8,020.2	7,439.5
Accumulated depreciation	(4,065.3)	(3,603.5)
Total	\$3,954.9	\$3,836.0
Other intangible assets, net		
Intangible assets not subject to amortization		
Trade names	\$1,230.0	\$1,230.0
Intangible assets subject to amortization		
Customer relationships	3,742.1	3,649.3
Trademarks	409.9	384.9
Patents	479.4	470.2
Other technology	297.2	242.8
Total	4,928.6	4,747.2
Accumulated amortization		
Customer relationships	(1,835.9)	(1,604.0)
Trademarks	(205.1)	(175.2)
Patents	(231.6)	(207.3)
Other technology	(213.5)	(193.0)
Total	(2,486.1)	(2,179.5)
Net intangible assets subject to amortization	2,442.5	2,567.7
Total	\$3,672.5	\$3,797.7
Other assets		
Deferred income taxes	\$155.6	\$105.1
Pension	31.1	39.0
Derivative asset	25.4	11.8
Restricted cash	-	179.3
Other	372.0	349.9
Total	\$584.1	\$685.1

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(millions)	December 31 2019	December 31 2018
Other current liabilities		
Discounts and rebates	\$331.4	\$291.3
Dividends payable	135.6	132.4
Interest payable	40.9	44.5
Taxes payable, other than income	113.4	116.9
Derivative liabilities	5.8	20.1
Restructuring	107.1	73.7
Contract liability	84.7	75.8
Operating lease liabilities	153.2	-
Other	251.3	251.4
Total	\$1,223.4	\$1,006.1
Accumulated other comprehensive loss		
Unrealized gain (loss) on derivative financial instruments, net of tax	\$(4.1)	\$2.0
Unrecognized pension and postretirement benefit expense, net of tax	(823.8)	(518.9)
Cumulative translation, net of tax	(1,261.8)	(1,244.8)
Total	\$(2,089.7)	\$(1,761.7)

6. DEBT AND INTEREST

Short-term Debt

The following table provides the components of the Company's short-term debt obligations, along with applicable interest rates as of December 31, 2019 and 2018:

(millions)	2019		2018	
	Carrying Value	Average Interest Rate	Carrying Value	Average Interest Rate
Short-term debt				
Commercial paper	\$55.1	(0.30)%	\$165.4	0.18 %
Notes payable	24.6	3.53 %	176.8	1.47 %
Long-term debt, current maturities	300.9		401.4	
Total	\$380.6		\$743.6	

Line of Credit

As of December 31, 2019, the Company had in place a \$2.0 billion multi-currency revolving credit facility which matures in November 2022. The credit facility has been established with a diverse syndicate of banks and supports the Company's U.S. and Euro commercial paper programs. There were no borrowings under the Company's credit facility as of December 31, 2019 and 2018.

Commercial Paper

The Company's commercial paper program is used as a potential source of liquidity and consists of a \$2.0 billion U.S. commercial paper program and a \$2.0 billion Euro commercial paper program. The maximum aggregate amount of commercial paper that may be issued by the Company under its commercial paper programs may not exceed \$2.0 billion.

As of December 31, 2019 and 2018, the Company had \$55.1 million (€50.0 million) and \$141.4 million (€125.0 million), respectively, of commercial paper outstanding under its Euro program and as of December 31, 2018 the Company had \$24.0 million outstanding under its U.S. program.

As of December 31, 2019, the Company's short-term borrowing program was rated A-2 by Standard & Poor's, P-2 by Moody's and F-1 by Fitch.

Notes Payable

The Company's notes payable consists of uncommitted credit lines with major international banks and financial institutions, primarily to support global cash pooling structures. As of December 31, 2019 and 2018, the Company had \$24.6 million and \$176.8 million, respectively, outstanding under these credit lines. Approximately \$1,264 million and \$575 million of these credit lines were available for use as of December 31, 2019 and 2018, respectively.

Long-term Debt

The following table provides the components of the Company's long-term debt obligations, along with applicable interest rates as of December 31, 2019 and 2018:

(millions)	Maturity by Year	2019			2018		
		Carrying Value	Stated Interest Rate	Effective Interest Rate	Carrying Value	Stated Interest Rate	Effective Interest Rate
Long-term debt							
Public notes (2019 principal amount)							
Three year 2016 senior notes (\$400 million)	2019	\$ -	- %	- %	\$399.7	2.00 %	3.24 %
Five year 2015 senior notes (\$300 million)	2020	300.0	2.25 %	2.79 %	299.5	2.25 %	2.79 %
Ten year 2011 senior notes (\$1.02 billion)	2021	1,018.3	4.35 %	4.43 %	1,017.6	4.35 %	4.43 %
Five year 2017 senior notes (\$500 million)	2022	497.8	2.38 %	2.55 %	496.9	2.38 %	2.55 %
Seven year 2016 senior notes (\$400 million)	2023	398.5	3.25 %	3.49 %	398.0	3.25 %	3.49 %
Seven year 2016 senior notes (€575 million)	2024	628.4	1.00 %	1.10 %	644.1	1.00 %	1.09 %
Ten year 2015 senior notes (€575 million)	2025	630.0	2.63 %	2.96 %	646.3	2.63 %	2.94 %
Ten year 2016 senior notes (\$750 million)	2026	744.5	2.70 %	2.93 %	743.8	2.70 %	2.93 %
Ten year 2017 senior notes (\$500 million)	2027	495.4	3.25 %	3.37 %	494.8	3.25 %	3.37 %
Thirty year 2011 senior notes (\$458 million)	2041	451.9	5.50 %	5.56 %	451.6	5.50 %	5.56 %
Thirty year 2016 senior notes (\$250 million)	2046	246.2	3.70 %	3.76 %	246.1	3.70 %	3.76 %
Thirty year 2017 senior notes (\$700 million)	2047	610.4	3.95 %	4.15 %	609.0	3.95 %	4.14 %
Private notes (2019 principal amount)							
Series B private placement senior notes (\$250 million)	2023	249.6	4.32 %	4.36 %	249.4	4.32 %	4.36 %
Finance lease obligations and other							
Total debt		6,274.4			6,703.0		
Long-term debt, current maturities		(300.9)			(401.4)		
Total long-term debt		\$5,973.5			\$6,301.6		

Public Notes

The Company's public notes may be redeemed by the Company at its option at redemption prices that include accrued and unpaid interest and a make-whole premium. Upon the occurrence of a change of control accompanied by a downgrade of the notes below investment grade rating, within a specified time period, the Company would be required to offer to repurchase the public notes at a price equal to 101% of the aggregate principal amount thereof, plus any accrued and unpaid interest to the date of repurchase. The public notes are senior unsecured and unsubordinated obligations of the Company and rank equally with all other senior and unsubordinated indebtedness of the Company.

Private Note

The Company's private note may be redeemed by the Company at its option at a redemption price that includes accrued and unpaid interest and a make-whole premium. Upon the occurrence of specified changes of control involving the Company, the Company would be required to offer to repurchase the private note at a price equal to 100% of the aggregate principal amount thereof, plus any accrued and unpaid interest to the date of repurchase. Additionally, the Company would be required to make a similar offer to repurchase the private note upon the occurrence of specified merger events or asset sales involving the Company, when accompanied by a downgrade of the private note below investment grade rating, within a specified time period. The private note is an unsecured senior obligation of the Company and ranks equal in right of payment with all other senior indebtedness of the Company. The private note shall be unconditionally guaranteed by subsidiaries of the Company in certain circumstances, as described in the note purchase agreement as amended.

Covenants and Future Maturities

The Company is in compliance with all covenants under the Company's outstanding indebtedness at December 31, 2019.

As of December 31, 2019, the aggregate annual maturities of long-term debt for the next five years were:

(millions)	
2020	\$ 301
2021	1,020
2022	498
2023	648
2024	628

Net Interest Expense

Interest expense and interest income incurred during 2019, 2018 and 2017 were as follows:

(millions)	2019	2018	2017
Interest expense	\$215.3	\$237.2	\$274.6
Interest income	(24.1)	(14.9)	(19.6)
Interest expense, net	\$191.2	\$222.3	\$255.0

Interest expense generally includes the expense associated with the interest on the Company's outstanding borrowings. Interest expense also includes the amortization of debt issuance costs and debt discounts, which are both recognized over the term of the related debt.

During 2017, in anticipation of U.S. tax reform and a potential limit on interest deductibility in future years, the Company entered into transactions to exchange or retire certain long-term debt, and incurred debt exchange and extinguishment charges of \$21.9 million (\$13.6 million after tax), which are included as a component of interest expense, net on the Consolidated Statement of Income.

7. FAIR VALUE MEASUREMENTS

The Company's financial instruments include cash and cash equivalents, restricted cash, accounts receivable, accounts payable, contingent consideration obligations, commercial paper, notes payable, foreign currency forward contracts, interest rate swap agreements and long-term debt.

Fair value is defined as the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants as of the measurement date. A hierarchy has been established for inputs used in measuring fair value that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring the most observable inputs be used when available. The hierarchy is broken down into three levels:

Level 1 - Inputs are quoted prices in active markets that are accessible at the measurement date for identical assets or liabilities.

Level 2 - Inputs include observable inputs other than quoted prices in active markets.

Level 3 - Inputs are unobservable inputs for which there is little or no market data available.

The carrying amount and the estimated fair value for assets and liabilities measured on a recurring basis were:

(millions)	December 31, 2019			
	Carrying Amount	Fair Value Measurements		
		Level 1	Level 2	Level 3
Assets				
Foreign currency forward contracts	\$83.9	\$-	\$83.9	\$-
Liabilities				
Foreign currency forward contracts	10.0	-	10.0	-

(millions)	December 31, 2018			
	Carrying Amount	Fair Value Measurements		
		Level 1	Level 2	Level 3
Assets				
Foreign currency forward contracts	\$72.3	\$-	\$72.3	\$-
Liabilities				
Foreign currency forward contracts	41.1	-	41.1	-
Interest rate swap agreements	0.2	-	0.2	-

The carrying value of foreign currency forward contracts is at fair value, which is determined based on foreign currency exchange rates as of the balance sheet date and classified within level 2. The carrying value of interest rate swap contracts is at fair value, which is determined based on current interest rates and forward interest rates as of the balance sheet date and is classified within level 2. For purposes of fair value disclosure above, derivative values are presented gross. See further discussion of gross versus net presentation of the Company's derivatives within Note 8.

Contingent consideration liabilities are recognized and measured at fair value at the acquisition date and thereafter until paid or settled. Contingent consideration is classified within level 3 as the underlying fair value is determined using income-based valuation approaches appropriate for the terms and conditions of each respective earn-out. The consideration expected to be transferred is based on the

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Company's expectations of various financial measures. The ultimate payment of contingent consideration could deviate from current estimates based on the actual results of these financial measures. Contingent consideration activities during 2019 and 2018 were not significant to the Company's consolidated financial statements. There were no contingent consideration activities during 2017.

The carrying values of accounts receivable, accounts payable, cash and cash equivalents, restricted cash, commercial paper and notes payable approximate fair value because of their short maturities, and as such are classified within level 1.

The fair value of long-term debt is based on quoted market prices for the same or similar debt instruments (classified as level 2). The carrying amount and the estimated fair value of long-term debt, including current maturities, held by the Company were:

	December 31, 2019		December 31, 2018	
	Carrying Amount	Fair Value	Carrying Amount	Fair Value
Long-term debt, including current maturities	\$6,274.4	\$6,862.0	\$6,703.0	\$6,844.7

8. DERIVATIVES AND HEDGING TRANSACTIONS

The Company uses foreign currency forward contracts, interest rate swap agreements and foreign currency debt to manage risks associated with foreign currency exchange rates, interest rates and net investments in foreign operations. The Company does not hold derivative financial instruments of a speculative nature or for trading purposes. The Company records derivatives as assets and liabilities on the balance sheet at fair value. Changes in fair value are recognized immediately in earnings unless the derivative qualifies and is designated as a hedge. Cash flows from derivatives are classified in the statement of cash flows in the same category as the cash flows from the items subject to designated hedge or undesignated (economic) hedge relationships. The Company evaluates hedge effectiveness at inception and on an ongoing basis. If a derivative is no longer expected to be effective, hedge accounting is discontinued.

The Company is exposed to credit risk in the event of nonperformance of counterparties for foreign currency forward exchange contracts and interest rate swap agreements. The Company monitors its exposure to credit risk by using credit approvals and credit limits and by selecting major global banks and financial institutions as counterparties. The Company does not anticipate nonperformance by any of these counterparties, and therefore, recording a valuation allowance against the Company's derivative balance is not considered necessary.

Derivative Positions Summary

Certain of the Company's derivative transactions are subject to master netting arrangements that allow the Company to net settle contracts with the same counterparties. These arrangements generally do not call for collateral and as of the applicable dates presented below, no cash collateral had been received or pledged related to the underlying derivatives.

The respective net amounts are included in other current assets, other assets, other current liabilities and other liabilities on the Consolidated Balance Sheet.

The following table summarizes the gross fair value and the net value of the Company's outstanding derivatives.

(millions)

	Derivatives Assets		Derivatives Liabilities	
	December 31 2019	December 31 2018	December 31 2019	December 31 2018
(millions)				
Derivatives designated as hedging instruments				
Foreign currency forward contracts	\$67.4	\$40.4	\$2.1	\$10.2
Interest rate swap agreements	-	-	-	0.2
Derivatives not designated as hedging instruments				
Foreign currency forward contracts	16.5	31.9	7.9	30.9
Gross value of derivatives	83.9	72.3	10.0	41.3
Gross amounts offset in the Consolidated Balance Sheet				
Net value of derivatives	(4.2)	(17.7)	(4.2)	(17.7)
Net value of derivatives	\$79.7	\$54.6	\$5.8	\$23.6

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The following table summarizes the notional values of the Company's outstanding derivatives.

(millions)	Notional Values	
	December 31 2019	December 31 2018
Foreign currency forward contracts	\$ 4,004	\$ 6,226
Interest rate agreements	-	400

Cash Flow Hedges

The Company utilizes foreign currency forward contracts to hedge the effect of foreign currency exchange rate fluctuations on forecasted foreign currency transactions, including inventory purchases and intercompany royalty, intercompany loans, management fee and other payments. These forward contracts are designated as cash flow hedges. The changes in fair value of these contracts are recorded in accumulated other comprehensive income ("AOCI") until the hedged items affect earnings, at which time the gain or loss is reclassified into the same line item in the Consolidated Statement of Income as the underlying exposure being hedged. Cash flow hedged transactions impacting AOCI are forecasted to occur within the next four years. For forward contracts designated as hedges of foreign currency exchange rate risk associated with forecasted foreign currency transactions, the Company excludes the changes in fair value attributable to time value from the assessment of hedge effectiveness. The initial value of the excluded component (i.e., the forward points) is amortized on a straight-line basis over the life of the hedging instrument and recognized in the same line item in the Consolidated Statement of Income as the underlying exposure being hedged for intercompany loans. For all other cash flow hedge types, the forward points are mark-to-market monthly and recognized in the same line item in the Consolidated Statement of Income as the underlying exposure being hedged. The difference between fair value changes of the excluded component and the amount amortized in the Consolidated Statement of Income is recorded in AOCI.

Fair Value Hedges

The Company manages interest expense using a mix of fixed and floating rate debt. To help manage exposure to interest rate movements and to reduce borrowing costs, the Company may enter into interest rate swaps under which the Company agrees to exchange, at specified intervals, the difference between fixed and floating interest amounts calculated by reference to an agreed upon notional principal amount. The mark-to-market of these fair value hedges is recorded as gains or losses in interest expense and is offset by the gain or loss of the underlying debt instrument, which also is recorded in interest expense. These fair value hedges are highly effective and thus, there is no impact on earnings due to hedge ineffectiveness.

In January 2016, the Company entered into an interest rate swap agreement that converted its \$400 million 2.00% debt from a fixed interest rate to a floating interest rate. In January 2015, the Company entered into interest rate swap agreements that converted its \$300 million 1.55% debt and its \$250 million 3.69% debt from fixed rates to floating interest rates. In May 2014, the Company entered into an interest rate swap agreement that converted its \$500 million 1.45% debt from a fixed rate to a floating interest rate. The interest rate swap agreement tied to the Company's \$500 million 1.45% debt, \$300 million 1.55% debt, \$250 million 3.69% and \$400 million 2.00% debt expired in December 2017, January 2018, November 2018 and January 2019, respectively, upon repayment of the underlying debt.

The interest rate swaps referenced above were designated as fair value hedges.

Amounts recognized in the Consolidated Balance Sheet (millions)	Carrying amount of the hedged liabilities			Cumulative amount of the fair value hedging adjustment included in the carrying amount of the hedged liabilities		
	2019	2018	2017	2019	2018	2017
Long-term debt	\$-	\$399.7	\$944.6	\$-	\$0.1	\$7.6

Net Investment Hedges

The Company designates its outstanding \$1,258 million (€1,150 million as of year-end 2019) senior notes ("euronotes") and related accrued interest as a hedge of existing foreign currency exposures related to investments the Company has in certain euro denominated functional currency subsidiaries. Certain Euro commercial paper was also designated as a hedge of existing foreign currency exposures and matured in the fourth quarter of 2019 and third quarter of 2018. The revaluation gains and losses on the euronotes and Euro commercial paper, which are designated and effective as hedges of the Company's net investments, have been included as a component of the cumulative translation adjustment account, and were as follows:

(millions)	2019	2018	2017
Revaluation gains (losses), net of tax	\$31.4	\$57.5	\$(109.7)

Derivatives Not Designated as Hedging Instruments

The Company also uses foreign currency forward contracts to offset its exposure to the change in value of certain foreign currency denominated assets and liabilities held at foreign subsidiaries, primarily receivables and payables, which are remeasured at the end of each period. Although the contracts are effective economic hedges, they are not designated as accounting hedges. Therefore, changes in the value of these derivatives are recognized immediately in earnings, thereby offsetting the current earnings effect of the related foreign currency denominated assets and liabilities.

Effect of all Derivative Instruments on Income

The gain (loss) of all derivative instruments recognized in product and equipment cost of sales ("COS"), selling, general and administrative expenses ("SG&A") and interest expense, net ("interest") is summarized below:

(millions)	2019			2018			2017		
	COS	SG&A	Interest	COS	SG&A	Interest	COS	SG&A	Interest
Gain (loss) on derivatives in cash flow hedging relationship:									
Foreign currency forward contracts									
Amount of gain (loss) reclassified from AOCI to income	\$15.4	\$39.5	\$-	\$(7.7)	\$84.1	\$-	\$(13.7)	\$(157.2)	\$-
Amount excluded from the assessment of effectiveness recognized in earnings based on changes in fair value	-	-	28.7	-	-	37.4	-	-	24.5
Interest rate swap agreements									
Amount of gain (loss) reclassified from AOCI to income	-	-	(0.9)	-	-	(5.5)	-	-	(7.2)
Gain (loss) on derivatives in fair value hedging relationship:									
Interest rate swaps									
Hedged items	-	-	0.2	-	-	(4.0)	-	-	0.7
Derivatives designated as hedging instruments	-	-	(0.2)	-	-	4.0	-	-	(0.7)
Gain (loss) on derivatives not designated as hedging instruments:									
Foreign currency forward contracts									
Amount of gain (loss) recognized in income	-	30.0	(0.1)	-	25.1	5.3	-	(38.2)	(3.0)
Total gain (loss) of all derivative instruments	\$15.4	\$69.5	\$27.7	\$(7.7)	\$109.2	\$37.2	\$(13.7)	\$(195.4)	\$14.3

9. OTHER COMPREHENSIVE INCOME (LOSS) INFORMATION

Other comprehensive income (loss) includes net income, foreign currency translation adjustments, unrecognized gains and losses on securities, defined benefit pension and postretirement plan adjustments, gains and losses on derivative instruments designated and effective as cash flow hedges and non-derivative instruments designated and effective as foreign currency net investment hedges that are charged or credited to the accumulated other comprehensive loss account in shareholders' equity.

The following table provides other comprehensive income (loss) information related to the Company's derivatives and hedging instruments and pension and postretirement benefits. See Note 8 for additional information related to the Company's derivatives and hedging transactions. See Note 16 for additional information related to the Company's pension and postretirement benefits activity.

(millions)	2019	2018	2017
Derivative and Hedging Instruments			
Unrealized gains (losses) on derivative & hedging instruments			
Amount recognized in AOCI	\$78.1	\$144.4	\$(173.4)
(Gains) losses reclassified from AOCI into income			
COS	(15.4)	7.7	13.7
SG&A	(39.5)	(84.1)	157.2
Interest (income) expense, net	(27.8)	(31.9)	(17.3)
	(82.7)	(108.3)	153.6
Other activity	0.8	-	0.2
Tax impact	0.4	(7.7)	1.7
Net of tax	\$(3.4)	\$28.4	\$(17.9)
Pension and Postretirement Benefits			
Amount recognized in AOCI			
Current period net actuarial income (loss) and prior service costs	\$(326.3)	\$(56.5)	\$(46.9)
Amount reclassified from AOCI into income			
Amortization of net actuarial loss and prior service costs and benefits	0.4	28.4	21.5
Pension and postretirement benefits changes	-	59.3	-
	(325.9)	31.2	(25.4)
Tax impact	74.3	(13.2)	16.2
Net of tax	\$(251.6)	\$18.0	\$(9.2)

10. SHAREHOLDERS' EQUITY

Authorized common stock, par value \$1.00 per share, was 800 million shares at December 31, 2019, 2018 and 2017. Treasury stock is stated at cost. Dividends declared per share of common stock were \$1.85 for 2019, \$1.69 for 2018 and \$1.52 for 2017.

The Company has 15 million shares, without par value, of authorized but unissued and undesignated preferred stock.

Share Repurchase Authorization

In February 2015, the Company's Board of Directors authorized the repurchase of up to 20 million additional shares of its common stock, including shares to be repurchased under Rule 10b5-1. As of December 31, 2019, 6,805,010 shares remained to be repurchased under the Company's repurchase authorization. The Company intends to repurchase all shares under its authorization, for which no expiration date has been established, in open market or privately negotiated transactions, subject to market conditions.

Accelerated Stock Repurchase ("ASR") Agreements

In February 2017, the Company entered into an ASR agreement to repurchase \$300 million of its common stock and received 2,077,224 shares of its common stock, which was approximately 85% of the total number of shares the Company expected to be repurchased under the ASR, based on the price of the Company's common stock at that time. In connection with the final settlement of the ASR agreement in June 2017, the Company received an additional 286,620 shares of common stock. The final per share purchase price and the total number of shares to be repurchased was based on the volume-weighted average price of the Company's common stock during the term of the agreement and all shares acquired were recorded as treasury stock.

During the open periods in 2017, the ASR was not dilutive to the Company's earnings per share calculations, nor did it trigger the two-class earnings per share methodology. Additionally, the unsettled portion of ASR during the open periods met the criteria to be accounted for as a forward contract indexed to the Company's stock and qualified as an equity transaction. The initial delivery of shares, as well as the additional receipt of shares at settlement resulted in a reduction to the Company's common stock outstanding used to calculate earnings per share.

Share Repurchases

During 2019 and 2018, the Company reacquired 1,986,241 and 3,908,041 shares, respectively, of its common stock, of which 1,846,384 and 3,706,716, respectively, related to share repurchases through open market or private purchases, and 139,857 and 201,325, respectively, related to shares withheld for taxes on exercise of stock options and vesting of stock awards and units.

11. EQUITY COMPENSATION PLANS

The Company's equity compensation plans provide for grants of stock options, performance-based restricted stock units ("PBRsUs") and non-performance-based restricted stock units ("RSUs") and restricted stock awards ("RSAs"). Common shares available for grant as of December 31, 2019, 2018 and 2017 were 9,029,645, 10,152,863 and 11,685,090, respectively. The Company generally issues authorized but previously unissued shares to satisfy stock option exercises and stock award vestings.

The Company's annual long-term incentive share-based compensation program is made up of 50% stock options and 50% PBRsUs. The Company also periodically grants RSUs. Total compensation expense related to all share-based compensation plans was \$91 million (\$76 million net of tax benefit), \$94 million (\$78 million net of tax benefit) and \$90 million (\$62 million net of tax benefit) for 2019, 2018 and 2017, respectively. As of December 31, 2019, there was \$124 million of total measured but unrecognized compensation expense related to non-vested share-based compensation arrangements granted under all of the Company's plans. That cost is expected to be recognized over a weighted-average period of 2.1 years.

Stock Options

Stock options are granted to purchase shares of the Company's stock at the average daily share price on the date of grant. These options generally expire within ten years from the grant date. The Company generally recognizes compensation expense for these awards on a straight-line basis over the three year vesting period. Stock option grants to retirement eligible recipients are attributed to expense using the non-substantive vesting method.

A summary of stock option activity and average exercise prices is as follows:

	2019		2018		2017	
	Number of Options	Exercise Price (a)	Number of Options	Exercise Price (a)	Number of Options	Exercise Price (a)
Outstanding, beginning of year	10,516,633	\$ 108.28	11,380,013	\$ 95.76	11,910,501	\$ 84.22
Granted	879,862	184.31	1,202,314	158.23	1,491,893	136.87
Exercised	(2,270,374)	82.93	(1,942,192)	64.63	(1,951,920)	56.00
Canceled	(83,801)	143.08	(123,502)	127.02	(70,461)	116.44
Outstanding, end of year	9,042,320	\$ 108.28	10,516,633	\$ 108.28	11,380,013	\$ 95.76
Exercisable, end of year	7,048,422	\$ 109.34	7,993,297	\$ 97.13	8,371,809	\$ 84.40
Vested and expected to vest, end of year	8,923,240	\$ 121.14				

(a) Represents weighted average price per share.

The total aggregate intrinsic value of options (the amount by which the stock price exceeded the exercise price of the option on the date of exercise) that were exercised during 2019, 2018 and 2017 was \$227 million, \$161 million and \$142 million, respectively.

The total aggregate intrinsic value of options outstanding as of December 31, 2019 was \$636 million, with a corresponding weighted-average remaining contractual life of 6.3 years. The total aggregate intrinsic value of options exercisable as of December 31, 2019 was \$583 million, with a corresponding weighted-average remaining contractual life of 5.5 years. The total aggregate intrinsic value of options vested and expected to vest as of December 31, 2019 was \$633 million, with a corresponding weighted-average remaining contractual life of 6.2 years.

The lattice (binomial) option-pricing model is used to estimate the fair value of options at grant date. The Company's primary employee option grant occurs during the fourth quarter. The weighted-average grant-date fair value of options granted and the significant assumptions used in determining the underlying fair value of each option grant, on the date of grant were as follows:

	2019	2018	2017
Weighted-average grant-date fair value of options granted at market prices	\$ 40.30	\$ 37.34	\$ 30.34
Assumptions			
Risk-free rate of return	1.6 %	2.8 %	2.2 %
Expected life	6 years	6 years	6 years
Expected volatility	23.0 %	22.5 %	22.7 %
Expected dividend yield	1.0 %	1.2 %	1.2 %

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The risk-free rate of return is determined based on a yield curve of U.S. treasury rates from one month to ten years and a period commensurate with the expected life of the options granted. Expected volatility is established based on historical volatility of the Company's stock price. The expected dividend yield is determined based on the Company's annual dividend amount as a percentage of the average stock price at the time of the grant.

PBRsUs, RSUs and RSAs

The expense associated with PBRsUs is based on the average of the high and low share price of the Company's common stock on the date of grant, adjusted for the absence of future dividends. The awards vest based on the Company achieving a defined performance target and with continued service for a three year period. Upon vesting, the Company issues shares of its common stock such that one award unit equals one share of common stock. The Company assesses the probability of achieving the performance target and recognizes expense over the three year vesting period when it is probable the performance target will be met. PBRsU awards granted to retirement eligible recipients are attributed to expense using the non-substantive vesting method. The awards are generally subject to forfeiture in the event of termination of employment.

The expense associated with shares of non-performance based RSUs and RSAs is based on the average of the high and low share price of the Company's common stock on the date of grant, adjusted for the absence of future dividends and is amortized on a straight-line basis over the periods during which the restrictions lapse. The Company currently has RSUs that vest over periods between 12 and 60 months. The awards are generally subject to forfeiture in the event of termination of employment.

A summary of non-vested PBRsUs and restricted stock activity is as follows:

	PBRsU Awards	Grant Date Fair Value (a)	RSAs and RSUs	Grant Date Fair Value (a)
December 31, 2016	1,386,687	\$ 107.70	254,387	\$ 107.95
Granted	323,750	131.71	96,980	125.34
Vested / Earned	(312,745)	99.65	(86,622)	102.02
Canceled	(34,856)	108.16	(15,343)	109.72
December 31, 2017	1,362,836	\$ 115.24	249,402	\$ 116.66
Granted	284,104	152.59	109,074	138.69
Vested / Earned	(324,561)	103.15	(92,032)	113.03
Canceled	(55,026)	114.25	(19,975)	115.05
December 31, 2018	1,267,353	\$ 126.75	246,469	\$ 127.09
Granted	207,704	178.20	102,941	177.38
Vested / Earned	(334,351)	114.38	(64,597)	119.08
Canceled	(23,808)	135.70	(19,300)	124.77
December 31, 2019	1,116,898	\$ 139.83	265,513	\$ 149.46

(a) Represents weighted average price per share.

12. INCOME TAXES

Income before income taxes consisted of:

(millions)	2019	2018	2017
United States	\$752.6	\$728.3	\$847.3
International	1,146.3	1,076.3	915.1
Total	\$1,898.9	\$1,804.6	\$1,762.4

The provision (benefit) for income taxes consisted of:

(millions)	2019	2018	2017
Federal and state	\$135.4	\$103.5	\$241.8
International	225.0	175.7	355.1
Total current	360.4	279.2	596.9
Federal and state	32.7	51.8	(331.4)
International	(70.4)	33.3	(21.7)
Total deferred	(37.7)	85.1	(353.1)
Provision for income taxes	\$322.7	\$364.3	\$243.8

The Company's overall net deferred tax assets and deferred tax liabilities were comprised of the following:

December 31 (millions)	2019	2018
Deferred tax assets		
Other accrued liabilities	\$141.5	\$130.9
Loss carryforwards	71.3	217.2
Share-based compensation	58.4	60.5
Pension and other comprehensive income	208.6	145.8
Lease liability	117.9	-
Other, net	83.0	68.5
Valuation allowance	(45.4)	(184.4)
Total deferred tax assets	635.3	438.5
Deferred tax liabilities		
Property, plant and equipment basis differences	(307.9)	(268.5)
Intangible assets	(729.8)	(783.3)
Lease asset	(118.4)	-
Other, net	(64.0)	(46.2)
Total deferred tax liabilities	(1,220.1)	(1,098.0)
Net deferred tax liabilities balance	\$584.8	\$(659.5)

As of December 31, 2019, the Company has tax effected federal, state and international net operating loss carryforwards of \$0.2 million, \$19.1 million and \$52.0 million, respectively, which will be available to offset future taxable income. The state loss carryforwards expire from 2020 to 2040. For the international loss carryforwards, \$27.1 million expire from 2020 to 2040 and \$24.9 million have no expiration.

The Company has valuation allowances on certain deferred tax assets of \$45.4 million and \$184.4 million at December 31, 2019 and 2018, respectively. The decrease in valuation allowance from year end 2018 to year end 2019 was due to changes in future utilization of losses related to an internal entity reorganization from 2018 which has subsequently been deemed a worthless asset and therefore the Company has written off both the loss carryforward and related valuation allowance. Current year losses increased the valuation allowance while foreign currency translation decreased the valuation allowance.

In 2019, the Company obtained tax benefits from tax holidays in two foreign jurisdictions, the Dominican Republic and Singapore. The Company received a permit of operation, which expires in July 2021, from the National Council of Free Zones of Exportation for the Dominican Republic. Companies operating under the Free Zones are not subject to income tax in the Dominican Republic on export income. The Company has two tax incentives awarded by the Singapore Economic Development Board. These incentives provide for a preferential 10% tax rate on certain headquarter income which expires in January 2021 and a 0% tax rate on manufacturing profits generated at the Company's facility located on Jurong Island which expires in December 2024. The tax reduction as the result of the tax holidays for 2019 was \$29.8 million (\$0.10 per diluted share), 2018 was \$25.6 million (\$0.09 per diluted share) and 2017 was \$16.9 million (\$0.06 per diluted share).

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A reconciliation of the statutory U.S. federal income tax rate to the Company's effective income tax rate is as follows:

	2019	2018	2017
Statutory U.S. rate	21.0 %	21.0 %	35.0 %
One-time transition tax	(0.2)	3.7	9.1
State income taxes, net of federal benefit	1.8	1.2	0.4
Foreign operations	4.8	(13.5)	(7.4)
Domestic manufacturing deduction	-	-	(2.2)
R&D credit	(1.1)	(1.0)	(1.0)
Change in valuation allowance	(7.4)	9.1	0.2
Audit settlements and refunds	-	(0.8)	(0.1)
Excess stock benefits	(2.3)	(1.6)	(2.3)
Change in federal tax rate (deferred taxes)	-	(0.6)	(18.2)
Prior year adjustments	-	2.5	-
Other, net	0.4	0.2	0.3
Effective income tax rate	17.0 %	20.2 %	13.8 %

The change in the Company's tax rate includes the tax impact of special (gains) and charges and discrete tax items, which have impacted the comparability of the Company's historical reported tax rates, as amounts included in special (gains) and charges are derived from tax jurisdictions with rates that vary from the Company's tax rate, and discrete tax items are not necessarily consistent across periods. The tax impact of special (gains) and charges and discrete tax items will likely continue to impact comparability of the Company's reported tax rate in the future. The enactment of the Tax Act also significantly impacted the comparability of the Company's reported tax rate.

In 2017, the Company recorded a provisional amount for the income tax effects related to the one-time transition tax of \$160.1 million which is subject to payment over eight years. In 2019 and 2018, the Company recorded additional discrete benefit of \$3.1 million and discrete expense of \$66.0 million, respectively, related to the one-time transition tax primarily due to the issuance of further technical guidance with respect to the Tax Act and the finalization of certain estimates as a result of the filing the 2017 and 2018 U.S. federal tax returns. The Company continues to assert permanent reinvestment of the undistributed earnings of international affiliates, and, if there are policy changes, the Company would record the applicable taxes in that period of change. Accordingly, no deferred taxes have been provided for withholding taxes or other taxes as it is not practical to estimate the tax liability that might be incurred if such earnings were remitted to the U.S.

The Company files U.S. federal income tax returns and income tax returns in various U.S. state and non-U.S. jurisdictions. With few exceptions, the Company is no longer subject to state and foreign income tax examinations by tax authorities for years before 2016. The IRS has completed examinations of the Company's U.S. federal income tax returns through 2016, and the years 2017 and 2018 are currently under audit. In addition to the U.S. federal examination, there is ongoing audit activity in several U.S. state and foreign jurisdictions. The Company anticipates changes to uncertain tax positions due to closing of various audit years mentioned above. The Company does not believe these changes will result in a material impact during the next twelve months. Decreases in the Company's gross liability could result in offsets to other balance sheet accounts, cash payments, and adjustments to tax expense. The occurrence of these events and/or other events not included above within the next twelve months could change depending on a variety of factors and result in amounts different from above.

The Company's 2019 reported tax rate includes \$3.1 million of net benefit associated with the Tax Act, \$57.2 million of net tax benefits on special (gains) and charges, and net tax benefits of \$55.3 million associated with discrete tax items. During 2019, the Company recorded a discrete tax benefit of \$43.1 million related to excess tax benefits resulting from the treatment of tax benefits on share-based compensation. The extent of excess tax benefits is subject to variation in stock price and stock option exercises. The Company recognized \$15.6 million tax benefit related to changes in local tax law, which primarily includes \$30.4 million benefit due to the passage of the Swiss Tax Reform and AHV Financing Act, a Swiss federal tax law, offset by a tax expense of \$10.2 million due to the release of the final Treasury Regulation governing taxation of foreign dividends. The Company recorded changes in reserves in non-U.S. and U.S. jurisdictions due to audit settlements and statutes of limitations which resulted in a \$16.8 million tax benefit. The Company finalized the 2015 and 2016 IRS audit in 2019, which resulted in a discrete tax expense of \$11.0 million. The remaining discrete tax expense was primarily related to changes in estimates in non-U.S. jurisdictions.

The Company's 2018 reported tax rate includes \$66.0 million of net tax expense associated with the Tax Act, \$33.5 million of net tax benefits on special (gains) and charges, and net tax benefits of \$61.3 million associated with discrete tax items. During 2018, the Company recorded a discrete tax benefit of \$28.1 million related to excess tax benefits resulting from the adoption of accounting changes regarding the treatment of tax benefits on share-based compensation. The extent of excess tax benefits is subject to variation in stock price and stock option exercises. In addition, the Company recorded net discrete benefit of \$39.9 million related to adjustments from filing the 2017 U.S. federal income tax return and IRS approved method change. Included within the 2018 provision for income taxes is \$44.2 million of discrete charges recorded in the fourth quarter to correct immaterial errors in prior years. The remaining discrete expense was primarily related to changes in reserves, audit settlements, international and U.S. changes in estimates, and accounting for internal entity reorganization.

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The Company's 2017 reported tax rate includes \$158.9 million of net tax benefits associated with the Tax Act, \$6.2 million of net tax benefits on special (gains) and charges, and net tax benefits of \$25.3 million associated with discrete tax items. In connection with the Company's initial analysis of the impact of the Tax Act, as noted above, a provisional net discrete tax benefit of \$158.9 million was recorded in the period ended December 31, 2017, which includes \$319.0 million tax benefit for recording deferred tax assets and liabilities at the U.S. enacted tax rate, and a net expense for the one-time transition tax of \$160.1 million.

Special (gains) and charges represent the tax impact of special (gains) and charges, as well as additional tax benefits utilized in anticipation of U.S. tax reform of \$7.8 million. During 2017, the Company recorded a discrete tax benefit of \$39.7 million related to excess tax benefits, resulting from the adoption of accounting changes regarding the treatment of tax benefits on share-based compensation. The extent of excess tax benefits is subject to variation in stock price and stock option exercises. In addition, the Company recorded net discrete expenses of \$14.4 million related to recognizing adjustments from filing the 2016 U.S. federal income tax return and international adjustments due to changes in estimates, partially offset by the release of reserves for uncertain tax positions due to the expiration of statute of limitations in state tax matters.

A reconciliation of the beginning and ending amount of gross liability for unrecognized tax benefits is as follows:

(millions)	2019	2018	2017
Balance at beginning of year	\$49.7	\$61.5	\$75.9
Additions based on tax positions related to the current year	2.1	3.0	3.2
Additions for tax positions of prior years	1.0	2.0	—
Reductions for tax positions of prior years	(18.4)	(8.7)	(4.9)
Reductions for tax positions due to statute of limitations	(5.7)	(5.8)	(14.0)
Settlements	(0.6)	(0.8)	(10.8)
Assumed in connection with acquisitions	-	-	10.0
Foreign currency translation	(0.4)	(1.5)	2.1
Balance at end of year	\$27.7	\$49.7	\$61.5

The total amount of unrecognized tax benefits, if recognized would have affected the effective tax rate by \$24.5 million as of December 31, 2019, \$36.4 million as of December 31, 2018 and \$47.1 million as of December 31, 2017.

The Company recognizes interest and penalties related to unrecognized tax benefits in its provision for income taxes. During 2019, 2018 and 2017 the Company released \$1.8 million, \$1.2 million and \$0.9 million related to interest and penalties, respectively. The Company had \$6.2 million, \$8.1 million and \$9.3 million of accrued interest, including minor amounts for penalties, at December 31, 2019, 2018, and 2017, respectively.

13. RENTALS AND LEASES

Lessee

The Company leases sales and administrative office facilities, distribution centers, research and manufacturing facilities, as well as vehicles and other equipment under operating leases. The Company also enters into insignificant finance leases.

The Company's operating lease cost was as follows:

(millions)	2019
Operating lease cost*	\$219.4

*Includes immaterial short-term and variable lease costs

Future maturity of operating lease liabilities as of December 31, 2019 is as follows:

(millions)	
2020	174
2021	150
2022	109
2023	68
2024	37
Thereafter	121
Total lease payments	659
Less: imputed interest	81
Present value of lease liabilities	\$ 578

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Total rental expense under the Company's operating leases was \$210 million in 2018 and \$239 million in 2017. As of December 31, 2018, identifiable future minimum payments with non-cancelable terms in excess of one year were:

(millions)	
2019	\$ 172
2020	141
2021	108
2022	72
2023	37
Thereafter	104
Total	\$ 634

The Company's operating leases term and discount rate were as follows:

	December 31
	2019
Weighted-average remaining lease terms (years)	6.03
Weighted-average discount rate	4.00%

The Company's other lease information was as follows:

(millions)	2019
Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash flows from operating leases	\$200.8
Leased assets obtained in exchange for new operating lease liabilities	181.6

Lessor

The Company leases warewashing and water treatment equipment to customers under operating leases.

Gross assets under operating leases recorded in Property, plant and equipment, net is \$1,113.6 million and related accumulated depreciation is \$621.8 million as of December 31, 2019.

The Company's operating lease revenue was as follows:

(millions)	2019
Operating lease revenue*	\$441.3

*Includes immaterial variable lease revenue

Revenue from operating leases for existing contracts as of December 31, 2019 is as follows:

(millions)	
2020	382
2021	292
2022	222
2023	143
2024	58
Thereafter	17
Total lease revenue	\$ 1,114

The Company mitigates the risk of residual value subsequent to the lease term by redeploying assets. As such, the Company expects to receive revenue from the operating lease assets through the remaining useful life and therefore subsequent to the initial contract termination date.

14. RESEARCH AND DEVELOPMENT EXPENDITURES

Research expenditures that relate to the development of new products and processes, including significant improvements and refinements to existing products, are expensed as incurred. Such costs were \$209 million in 2019, \$216 million in 2018 and \$201 million in 2017. The Company did not participate in any material customer sponsored research during any of the years.

15. COMMITMENTS AND CONTINGENCIES

The Company is subject to various claims and contingencies related to, among other things, workers' compensation, general liability (including product liability), automobile claims, health care claims, income taxes, environmental matters and lawsuits. The Company is also subject to various claims and contingencies related to income taxes, which are discussed in Note 12. The Company also has contractual obligations including to lease commitments, which are discussed in Note 13.

The Company records liabilities where a contingent loss is probable and can be reasonably estimated. If the reasonable estimate of a probable loss is a range, the Company records the most probable estimate of the loss or the minimum amount when no amount within the range is a better estimate than any other amount. The Company discloses a contingent liability even if the liability is not probable or the amount is not estimable, or both, if there is a reasonable possibility that a material loss may have been incurred.

Insurance

Globally, the Company has insurance policies with varying deductible levels for property and casualty losses. The Company is insured for losses in excess of these deductibles, subject to policy terms and conditions and has recorded both a liability and an offsetting receivable for amounts in excess of these deductibles. The Company is self-insured for health care claims for eligible participating employees, subject to certain deductibles and limitations. The Company determines its liabilities for claims on an actuarial basis.

Litigation and Environmental Matters

The Company and certain subsidiaries are party to various lawsuits, claims and environmental actions that have arisen in the ordinary course of business. These include from time to time antitrust, commercial, patent infringement, product liability and wage hour lawsuits, as well as possible obligations to investigate and mitigate the effects on the environment of the disposal or release of certain chemical substances at various sites, such as Superfund sites and other operating or closed facilities. The Company has established accruals for certain lawsuits, claims and environmental matters. The Company currently believes that there is not a reasonably possible risk of material loss in excess of the amounts accrued related to these legal matters. Because litigation is inherently uncertain, and unfavorable rulings or developments could occur, there can be no certainty that the Company may not ultimately incur charges in excess of recorded liabilities. A future adverse ruling, settlement or unfavorable development could result in future charges that could have a material adverse effect on the Company's results of operations or cash flows in the period in which they are recorded. The Company currently believes that such future charges related to suits and legal claims, if any, would not have a material adverse effect on the Company's consolidated financial position.

Environmental Matters

The Company is currently participating in environmental assessments and remediation at approximately 40 locations, the majority of which are in the U.S., and environmental liabilities have been accrued reflecting management's best estimate of future costs. Potential insurance reimbursements are not anticipated in the Company's accruals for environmental liabilities.

Matters Related to Deepwater Horizon Incident Response

On April 22, 2010, the deepwater drilling platform, the Deepwater Horizon, operated by a subsidiary of BP plc, sank in the Gulf of Mexico after a catastrophic explosion and fire that began on April 20, 2010. A massive oil spill resulted. Approximately one week following the incident, subsidiaries of BP plc, under the authorization of the responding federal agencies, formally requested certain entities that are or will become subsidiaries of ChampionX upon completion of the transactions to separate and combine our Upstream Energy business with Apergy Corporation as discussed in Note 1 (collectively the "COREXIT Defendants") to supply large quantities of COREXIT™ 9500, an oil dispersant product listed on the U.S. EPA National Contingency Plan Product Schedule. The COREXIT Defendants responded immediately by providing available COREXIT™ and increasing production to supply the product to BP's subsidiaries for use, as authorized and directed by agencies of the federal government throughout the incident. Prior to the incident, the COREXIT Defendants had not provided products or services or otherwise had any involvement with the Deepwater Horizon platform. On July 15, 2010, BP announced that it had capped the leaking well, and the application of dispersants by the responding parties ceased shortly thereafter.

On May 1, 2010, the President of the United States appointed retired U.S. Coast Guard Commandant Admiral Thad Allen to serve as the National Incident Commander in charge of the coordination of the response to the incident at the national level. The EPA directed numerous tests of all the dispersants on the National Contingency Plan Product Schedule, including those provided by the COREXIT Defendants, "to ensure decisions about ongoing dispersant use in the Gulf of Mexico are grounded in the best available science." The COREXIT Defendants cooperated with this testing process and continued to supply COREXIT™, as requested by BP and government authorities. The use of dispersants by the responding parties was one tool used by the government and BP to avoid and reduce damage to the Gulf area from the spill.

In connection with its provision of COREXIT™, the COREXIT Defendants have been named in several lawsuits as described below.

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Cases arising out of the Deepwater Horizon accident were administratively transferred for pre-trial purposes to a judge in the United States District Court for the Eastern District of Louisiana (the "Court") with other related cases under In Re: Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, on April 20, 2010, Case No. 10-md-02179 (E.D. La.) ("MDL 2179"). The COREXIT Defendants were named, along with other unaffiliated defendants, in six putative class action complaints related to the Deepwater Horizon oil spill and 21 complaints filed by individuals. Those complaints were consolidated in MDL 2179. The complaints generally allege, among other things, strict liability and negligence relating to the use of COREXIT™ dispersant in connection with the Deepwater Horizon oil spill.

Pursuant to orders issued by the Court in MDL 2179, the claims were consolidated in several master complaints, including one naming the COREXIT Defendants and others that responded to the Deepwater Horizon oil spill (known as the "B3 Master Complaint"). On May 18, 2012, the COREXIT Defendants filed a motion for summary judgment against the claims in the B3 Master Complaint, on the grounds that: (i) the plaintiffs' claims are preempted by the comprehensive oil spill response scheme set forth in the Clean Water Act and National Oil and Hazardous Substances Pollution Contingency Plan (the "National Contingency Plan"); and (ii) the COREXIT Defendants are entitled to derivative immunity from suit. On November 28, 2012, the Court granted the COREXIT Defendants' motion and dismissed with prejudice the claims in the B3 Master Complaint asserted against the COREXIT Defendants. The Court held that such claims were preempted by the Clean Water Act and National Contingency Plan. Because claims in the B3 Master Complaint remained pending against other defendants, the Court's decision was not a "final judgment" for purposes of appeal. Under Federal Rule of Appellate Procedure 4(a), plaintiffs will have 30 days after entry of final judgment to appeal the Court's decision.

In December 2012 and January 2013, the MDL 2179 court issued final orders approving two settlements between BP and plaintiffs' class counsel: (1) a proposed Medical Benefits Class Action Settlement; and (2) a proposed Economic and Property Damages Class Action Settlement. Pursuant to the proposed settlements, class members agree to release claims against BP and other released parties, including the COREXIT Defendants.

The COREXIT Defendants, the incident defendants and the other responder defendants have been named as first party defendants by Transocean Deepwater Drilling, Inc. and its affiliates (the "Transocean Entities") (In re the Complaint and Petition of Triton Asset Leasing GmbH, et al, MDL No. 2179, Civil Action 10-2771). In April and May 2011, the Transocean Entities, Cameron International Corporation, Halliburton Energy Services, Inc., M-I L.L.C., Weatherford U.S., L.P. and Weatherford International, Inc. (collectively, the "Cross Claimants") filed cross claims in MDL 2179 against the COREXIT Defendants and other unaffiliated cross defendants. The Cross Claimants generally allege, among other things, that if they are found liable for damages resulting from the Deepwater Horizon explosion, oil spill and/or spill response, they are entitled to indemnity or contribution from the cross defendants.

In April and June 2011, in support of its defense of the claims against it, the COREXIT Defendants filed counterclaims against the Cross Claimants. In its counterclaims, the COREXIT Defendants generally allege that if they are found liable for damages resulting from the Deepwater Horizon explosion, oil spill and/or spill response, they are entitled to contribution or indemnity from the Cross Claimants.

In May 2016, the COREXIT Defendants were named in nine additional complaints filed by individuals alleging, among other things, business and economic loss resulting from the Deepwater Horizon oil spill ("B1" claims). In April 2017, the COREXIT Defendants were named in two additional complaints filed by individuals alleging, among other things, business and economic loss resulting from the Deepwater Horizon oil spill. The plaintiffs in these lawsuits are generally seeking awards of unspecified compensatory and punitive damages, and attorneys' fees and costs. These actions have been consolidated in MDL 2179.

On February 22, 2017, the Court dismissed the B3 Master Complaint and ordered that plaintiffs who had previously filed a claim that fell within the scope of the B3 Master Complaint and who had "opted out" of and not released their claims under the Medical Benefits Class Action Settlement either: (1) complete a sworn statement indicating, among other things, that they opted out of the Medical Benefits Class Action Settlement (to be completed by plaintiffs who previously filed an individual complaint); or (2) file an individual lawsuit attaching the sworn statement as an exhibit, by a deadline date set by the Court.

On July 10, 2018, the Court entered an order dismissing the "B1" claims against the COREXIT Defendants. In light of the Court's orders dismissing various B3 and "B1" claims in their entirety, for most plaintiffs the Court's November 28, 2012 grant of summary judgment for the COREXIT Defendants is now final and the deadline to appeal has passed. On October 23, 2018, a plaintiff filed a new B3 complaint against the COREXIT Defendants and other unaffiliated defendants generally alleging, among other things, negligence and gross negligence related to the use of COREXIT™ dispersant in connection with the Deepwater Horizon oil spill. The complaint was consolidated in MDL 2179. There currently remain three cases pending against the COREXIT Defendants relating to the Deepwater Horizon oil spill, all of which are expected to ultimately be dismissed pursuant to the Court's November 28, 2012 order granting the COREXIT Defendants' motion for summary judgment.

ChampionX believes the claims asserted against the COREXIT Defendants are without merit and intends to defend these lawsuits vigorously. ChampionX also believes that it has rights to contribution and/or indemnification (including legal expenses) from third parties. However, ChampionX cannot predict the outcome of these lawsuits, the involvement it might have in these matters in the future, or the potential for future litigation.

16. RETIREMENT PLANS

Pension and Postretirement Health Care Benefits Plans

The Company has a non-contributory, qualified, defined benefit pension plan covering the majority of its U.S. employees. The Company also has non-contributory, non-qualified, defined benefit plans, which provide for benefits to employees in excess of limits permitted under its U.S. pension plans. Various international subsidiaries have defined benefit pension plans. The Company provides postretirement health care benefits to certain U.S. employees and retirees.

The non-qualified plans are not funded and the recorded benefit obligation for the non-qualified plans was \$127 million and \$119 million at December 31, 2019 and 2018, respectively. The measurement date used for determining the U.S. pension plan assets and obligations is December 31.

International plans are funded based on local country requirements. The measurement date used for determining the international pension plan assets and obligations is November 30, the fiscal year-end of the Company's international affiliates.

The U.S. postretirement health care plans are contributory based on years of service and choice of coverage (family or single), with retiree contributions adjusted annually. The measurement date used to determine the U.S. postretirement health care plan assets and obligations is December 31. Certain employees outside the U.S. are covered under government-sponsored programs, which are not required to be fully funded. The expense and obligation for providing international postretirement health care benefits are not significant.

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The following table sets forth financial information related to the Company's pension and postretirement health care plans:

(millions)	U.S. Pension (a)		International Pension		U.S. Postretirement Health Care	
	2019	2018	2019	2018	2019	2018
Accumulated benefit obligation, end of year	\$2,535.9	\$2,189.0	\$1,585.5	\$1,349.9	\$165.7	\$147.3
Projected benefit obligation						
Projected benefit obligation, beginning of year	\$2,241.0	\$2,485.1	\$1,436.7	\$1,537.9	\$147.3	\$181.3
Service cost	72.8	74.5	30.2	33.2	1.4	2.7
Interest cost	89.0	83.1	31.2	29.1	5.6	5.6
Participant contributions	-	-	3.0	3.5	3.4	3.5
Medicare subsidies received	-	-	-	-	-	-
Curtailments and settlements	3.4	-	(18.6)	(22.8)	0.6	-
Plan amendments	-	(40.4)	0.1	-	-	(13.7)
Actuarial (gain) loss	336.4	(181.3)	235.8	(42.7)	22.2	(18.4)
Assumed through acquisitions	-	-	-	11.4	-	-
Other events	-	-	0.6	-	-	-
Benefits paid	(180.1)	(180.0)	(37.6)	(38.7)	(14.8)	(13.7)
Foreign currency translation	-	-	(13.8)	(74.2)	-	-
Projected benefit obligation, end of year	\$2,562.5	\$2,241.0	\$1,667.6	\$1,436.7	\$165.7	\$147.3
Plan assets						
Fair value of plan assets, beginning of year	\$1,981.4	\$2,226.4	\$925.6	\$981.1	\$6.0	\$7.6
Actual returns on plan assets	366.9	(70.7)	110.5	2.6	1.1	(0.2)
Company contributions	129.0	5.7	43.3	42.0	13.8	12.3
Participant contributions	-	-	3.0	3.5	-	-
Acquisitions	-	-	-	6.4	-	-
Curtailments and settlements	(4.3)	-	(17.6)	(22.8)	-	-
Benefits paid	(180.1)	(180.0)	(37.6)	(38.7)	(14.8)	(13.7)
Foreign currency translation	-	-	(0.1)	(48.5)	-	-
Fair value of plan assets, end of year	\$2,292.9	\$1,981.4	\$1,027.1	\$925.6	\$6.1	\$6.0
Funded Status, end of year	\$(269.6)	\$(259.6)	\$(640.5)	\$(511.1)	\$(159.6)	\$(141.3)
Amounts recognized in the Consolidated Balance Sheet:						
Other assets	\$-	\$-	\$31.1	\$39.0	\$-	\$-
Other current liabilities	(12.5)	(5.9)	(23.6)	(24.4)	(5.2)	(5.0)
Postretirement healthcare and pension benefits	(257.1)	(253.7)	(647.8)	(525.7)	(154.4)	(136.3)
Net liability	\$(269.6)	\$(259.6)	\$(640.3)	\$(511.1)	\$(159.6)	\$(141.3)
Amounts recognized in accumulated other comprehensive loss (income):						
Unrecognized net actuarial loss (gain)	\$632.4	\$539.2	\$527.7	\$368.0	\$(10.5)	\$(36.0)
Unrecognized net prior service costs (benefits)	(40.0)	(52.3)	0.6	(6.0)	(11.0)	(34.4)
Tax (benefit) expense	(149.1)	(194.4)	(129.6)	(92.7)	3.4	27.6
Accumulated other comprehensive loss (income), net of tax	\$443.3	\$292.5	\$398.7	\$269.3	\$(18.1)	\$(42.8)
Change in accumulated other comprehensive loss (income):						
Amortization of net actuarial (gain) loss	\$(23.5)	\$(38.9)	\$(17.3)	\$(16.5)	\$4.1	\$1.9
Amortization of prior service costs	11.5	6.8	1.1	0.9	23.2	19.7
Current period net actuarial loss (gain)	119.0	51.2	185.8	17.9	21.4	(17.8)
Current period prior service costs	-	-	0.1	-	-	5.2
Curtailments and settlements	(1.5)	-	1.8	(2.3)	0.2	-
Tax (benefit) expense	(25.7)	5.1	(36.9)	5.7	(11.7)	2.4
Pension and postretirement benefits changes	-	(40.4)	-	-	-	(18.9)
Foreign currency translation	-	-	(5.2)	(19.2)	-	-
Other comprehensive loss (income)	\$79.8	\$(16.2)	\$129.4	\$(13.5)	\$37.2	\$(7.5)

(a) Includes qualified and non-qualified plans

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Estimated amounts in accumulated other comprehensive loss expected to be reclassified to net period cost during 2020 are as follows:

(millions)	U.S. Pension (a)	International Pension	U.S. Post- Retirement Health Care
Net actuarial loss	\$51.9	\$25.5	\$0.1
Net prior service benefits	(7.4)	(0.1)	(11.0)
Total	\$44.5	\$25.4	\$(10.9)

(a) Includes qualified and non-qualified plans

Service cost is included with employee compensation cost in cost of sales and selling, general and administrative expenses in the Consolidated Statement of Income while all other components are included in other (income) expense in the Consolidated Statement of Income.

The aggregate projected benefit obligation, accumulated benefit obligation and fair value of pension plan assets for plans with accumulated benefit obligations in excess of plan assets were as follows:

December 31, (millions)	2019	2018
Aggregate projected benefit obligation	\$3,970.3	\$3,427.1
Accumulated benefit obligation	3,877.4	3,308.4
Fair value of plan assets	3,040.5	2,624.3

These plans include the U.S. non-qualified pension plans which are not funded as well as the U.S. qualified pension plan. These plans also include various international pension plans which are funded consistent with local practices and requirements.

Net Periodic Benefit Costs and Plan Assumptions

Pension and postretirement health care benefits expense for the Company's operations are as follows:

(millions)	U.S. Pension (a)			International Pension			U.S. Postretirement Health Care		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Service cost	\$72.8	\$74.5	\$70.2	\$30.2	\$33.2	\$31.4	\$1.4	\$2.7	\$2.6
Interest cost on benefit obligation	89.0	83.1	83.4	31.2	29.1	28.4	5.6	5.6	5.8
Expected return on plan assets	(149.5)	(161.9)	(149.9)	(59.9)	(63.2)	(56.3)	(0.4)	(0.4)	(0.5)
Recognition of net actuarial loss (gain)	23.6	39.0	28.7	16.3	17.2	18.5	(4.1)	(1.9)	(2.4)
Amortization of prior service benefit	(11.5)	(6.8)	(6.8)	(0.9)	(0.9)	(0.7)	(23.2)	(19.7)	(16.7)
Curtailments and settlements	9.1	-	0.3	(1.9)	2.3	0.9	0.3	-	-
Total expense (benefit)	\$33.5	\$27.9	\$25.9	\$15.0	\$17.7	\$22.2	\$(20.4)	\$(13.7)	\$(11.2)

(a) Includes qualified and non-qualified plans

Plan Assumptions (percent)	U.S. Pension (a)			International Pension			U.S. Postretirement Health Care		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Weighted-average actuarial assumptions used to determine benefit obligations as of year end:									
Discount rate	3.20 %	4.34 %	3.70 %	1.52 %	2.49 %	2.17 %	3.16 %	4.29 %	3.66 %
Projected salary increase	4.03	4.03	4.03	2.50	2.46	2.46			
Weighted-average actuarial assumptions used to determine net cost:									
Discount rate	4.34	3.70	4.27	2.66	2.29	2.32	4.29	3.66	4.14
Expected return on plan assets	7.25	7.75	7.75	6.66	6.67	6.67	7.25	7.75	7.75
Projected salary increase	4.03	4.03	4.03	2.70	2.67	2.83			

(a) Includes qualified and non-qualified plans

The discount rate assumptions for the U.S. plans are developed using a bond yield curve constructed from a population of high-quality, non-callable, corporate bond issues with maturities ranging from six months to thirty years. A discount rate is estimated for the U.S. plans and is based on the durations of the underlying plans.

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The Company measures service and interest costs by applying the specific spot rates along that yield curve to the plans' liability cash flows. The Company believes this approach provides a more precise measurement of service and interest costs by aligning the timing of the plans' liability cash flows to the corresponding spot rates on the yield curve.

The expected long-term rate of return used for the U.S. plans is based on the pension plan's asset mix. The Company considers expected long-term real returns on asset categories, expectations for inflation, and estimates of the impact of active management of the assets in determining the final rate to use. The Company also considers actual historical returns.

The expected long-term rate of return used for the Company's international plans is determined in each local jurisdiction and is based on the assets held in that jurisdiction, the expected rate of returns for the type of assets held and any guaranteed rate of return provided by the investment. The other assumptions used to measure the international pension obligations, including discount rate, vary by country based on specific local requirements and information. As previously noted, the measurement date for these plans is November 30.

The Company uses most recently available mortality tables as of the respective U.S. and international measurement dates.

For postretirement benefit measurement purposes as of December 31, 2019, the annual rates of increase in the per capita cost of covered health care were assumed to be 8.00% for pre-65 costs and 10.75% for post-65 costs. The rates are assumed to decrease each year until they reach 5% in 2028 and remain at those levels thereafter. Health care costs for certain employees which are eligible for subsidy by the Company are limited by a cap on the subsidy.

During the second quarter of 2018, an amendment to eligibility requirements of the U.S. retiree death benefit plan was approved and communicated to all eligible participants. As a result of the approval and communication to the beneficiaries, the plan was remeasured, resulting in an \$18.9 million (\$14.4 million after tax), reduction of postretirement benefit obligations, with a corresponding impact to accumulated other comprehensive income (AOCI). The re-measurement was completed using a discount rate of 4.36%. As a result of this action, the Company's U.S. postretirement healthcare costs decreased by \$4.5 million in 2018.

During the fourth quarter of 2018, the qualified U.S. pension plan was amended to allow unlimited lump sums for participants with the Final Average Pay benefit formula, effective with payments starting on or after June 1, 2019. This amendment allows participants to receive a lump sum benefit based on the present value of the accrued benefit at normal retirement age based on IRC 417(e) interest and mortality rates. As a result of this action, the U.S. pension plan benefit obligation was reduced by \$40.4 million with a corresponding impact to accumulated other comprehensive income (AOCI).

Assumed health care cost trend rates have an effect on the amounts reported for the Company's U.S. postretirement health care benefits plan. A one-percentage point change in the assumed health care cost trend rates would have an immaterial impact on total service and interest costs as well as total postretirement benefit obligation.

Plan Asset Management

The Company's U.S. investment strategy and policies are designed to maximize the possibility of having sufficient funds to meet the long-term liabilities of the pension fund, while achieving a balance between the goals of asset growth of the plan and keeping risk at a reasonable level. Current income is not a key goal of the policy.

The asset allocation position reflects the Company's ability and willingness to accept relatively more short-term variability in the performance of the pension plan portfolio in exchange for the expectation of better long-term returns, lower pension costs and better funded status in the long run. The pension fund is diversified across a number of asset classes and securities. Selected individual portfolios within the asset classes may be undiversified while maintaining the diversified nature of total plan assets. The Company has no significant concentration of risk in its U.S. plan assets.

Assets of funded retirement plans outside the U.S. are managed in each local jurisdiction and asset allocation strategy is set in accordance with local rules, regulations and practice. Therefore, no overall target asset allocation is presented. Although non-U.S. equity securities are all considered international for the Company, some equity securities are considered domestic for the local plan. The funds are invested in a variety of equities, bonds and real estate investments and, in some cases, the assets are managed by insurance companies which may offer a guaranteed rate of return. The Company has no significant concentration of risk in its international plan assets.

The fair value hierarchy is used to categorize investments measured at fair value in one of three levels in the fair value hierarchy. This categorization is based on the observability of the inputs used in valuing the investments. See Note 7 for definitions of these levels.

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The fair value of the Company's U.S. plan assets for its defined benefit pension and postretirement health care benefit plans are as follows:

(millions)	Fair Value as of December 31, 2019			Fair Value as of December 31, 2018		
	Level 1	Level 2	Total	Level 1	Level 2	Total
Cash	\$13.2	\$-	\$13.2	\$7.1	\$-	\$7.1
Equity securities:						
Large cap equity	785.9	-	785.9	683.5	-	683.5
Small cap equity	201.7	-	201.7	168.6	-	168.6
International equity	350.4	-	350.4	285.0	-	285.0
Fixed income:						
Core fixed income	410.0	-	410.0	358.3	-	358.3
High-yield bonds	107.9	-	107.9	107.6	-	107.6
Emerging markets	41.7	-	41.7	39.4	-	39.4
Insurance company accounts	-	0.3	0.3	-	0.3	0.3
Total investments at fair value	1,910.8	0.3	1,911.1	1,649.5	0.3	1,649.8
Investments measured at NAV			387.9			337.6
Total	\$1,910.8	\$0.3	\$2,299.0	\$1,649.5	\$0.3	\$1,987.4

The Company had no level 3 assets as part of its U.S. plan assets as of December 31, 2019 or 2018.

The allocation of the Company's U.S. plan assets for its defined benefit pension and postretirement health care benefit plans are as follows:

Asset Category	Target Asset Allocation Percentage		Percentage of Plan Assets	
	2019	2018	2019	2018
December 31				
Cash	- %	- %	1 %	- %
Equity securities:				
Large cap equity	34	34	34	34
Small cap equity	9	9	8	9
International equity	15	15	15	14
Fixed income:				
Core fixed income	18	18	18	19
High-yield bonds	5	5	5	5
Emerging markets	2	2	2	2
Other:				
Real estate	6	6	7	8
Private equity	8	8	7	7
Distressed debt	3	3	3	2
Total	100 %	100 %	100 %	100 %

The fair value of the Company's international plan assets for its defined benefit pension plans are as follows:

(millions)	Fair Value as of December 31, 2019			Fair Value as of December 31, 2018		
	Level 1	Level 2	Total	Level 1	Level 2	Total
Cash	\$7.7	\$-	\$7.7	\$7.1	\$-	\$7.1
Equity securities:						
International equity	-	418.1	418.1	-	412.1	412.1
Fixed income:						
Corporate bonds	8.2	207.6	215.8	7.9	162.1	170.0
Government bonds	12.6	215.8	228.4	12.3	169.2	181.5
Insurance company accounts	-	144.2	144.2	-	140.5	140.5
Total investments at fair value	28.5	985.7	1,014.2	27.3	883.9	911.2
Investments measured at NAV			12.9			14.4
Total	\$28.5	\$985.7	\$1,027.1	\$27.3	\$883.9	\$925.6

The Company had no level 3 assets as part of its international plan assets as of December 31, 2019 or 2018.

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The allocation of plan assets of the Company's international plan assets for its defined benefit pension plans are as follows:

Asset Category	Percentage of Plan Assets	
	2019	2018
December 31		
Cash	1 %	1 %
Equity securities:		
International equity	41	45
Fixed income:		
Corporate bonds	21	18
Government bonds	22	20
Total fixed income	43	38
Other:		
Insurance contracts	14	15
Real estate	1	1
Total	100 %	100 %

Cash Flows

As of year-end 2019, the Company's estimate of benefits expected to be paid in each of the next five fiscal years and in the aggregate for the five fiscal years thereafter for the Company's pension and postretirement health care benefit plans are as follows:

(millions)	All Plans
2020	\$ 253
2021	232
2022	263
2023	239
2024	251
2025 - 2029	1,244

Depending on plan funding levels, the U.S. defined benefit qualified pension plan provides certain terminating participants with an option to receive their pension benefits in the form of lump sum payments.

The Company is currently in compliance with all funding requirements of its U.S. pension and postretirement health care plans. In September of 2019 and 2017, the Company made voluntary contributions of \$120 million and \$80 million, respectively, to its non-contributory qualified U.S. pension plan. The Company is required to fund certain international pension benefit plans in accordance with local legal requirements. The Company estimates contributions to be made to its international plans will approximate \$46 million in 2020.

The Company seeks to maintain an asset balance that meets the long-term funding requirements identified by the projections of the pension plan's actuaries while simultaneously satisfying the fiduciary responsibilities prescribed in ERISA. The Company also takes into consideration the tax deductibility of contributions to the benefit plans.

The Company is not aware of any expected refunds of plan assets within the next twelve months from any of its existing U.S. or international pension or postretirement benefit plans.

Savings Plan and ESOP

The Company provides a 401(k) savings plan for the majority of its U.S. employees under the Company's two main 401(k) savings plans, the Ecolab Savings Plan and ESOP for Traditional Benefit Employees (the "Traditional Plan") and the Ecolab Savings Plan and ESOP (the "Ecolab Plan").

Employees under the Traditional Plan are limited to active employees accruing a final average pay or 5% cash balance benefits in the Ecolab Pension Plan. Employee before-tax contributions made under the Traditional Plan of up to 3% of eligible compensation are matched 100% by the Company and employee before-tax contributions over 3% and up to 5% of eligible compensation are matched 50% by the Company.

Employees under the Ecolab Plan are limited to active employees accruing benefits under the 3% cash balance formula of the Ecolab Pension Plan and employees of Nalco eligible for certain legacy final average pay benefits. Employee before-tax contributions made under the Ecolab Plan of up to 4% of eligible compensation are matched 100% by the Company and employee before-tax contributions over 4% and up to 8% of eligible compensation are matched 50% by the Company.

The Company's matching contributions are 100% vested immediately. The Company's matching contribution expense was \$87 million, \$83 million and \$82 million in 2019, 2018 and 2017, respectively.

17. REVENUES

Revenue Recognition

Product and Sold Equipment

Product revenue is generated from cleaning, sanitizing, water, energy and colloidal silica products sold to customers in the Global Industrial, Global Institutional, Global Energy segments and Other. In addition, the Company sells equipment which may be used in combination with its specialized products. Revenue recognized from product and sold equipment is recognized at the point in time when the obligations in the contract with the customer are satisfied, which generally occurs with the transfer of the product or delivery of the equipment.

Service and Lease Equipment

Service and lease equipment revenue is generated from providing services or leasing equipment to customers. Service offerings include installing or repairing certain types of equipment, activities that supplement or replace headcount at the customer location, or fulfilling deliverables included in the contract. Services provided in Other primary includes services designed to detect, eliminate and prevent pests. Global Energy services include process and water treatment offerings to the global petroleum and petrochemical industries, while services in the Global Industrial segment are associated with water treatment and paper process applications. Global Institutional services include water treatment programs and process applications, and wash process solutions. Revenue recognized from leased equipment primarily relates to warewashing and water treatment equipment. Service revenue is recognized over time utilizing an input method and aligns with when the services are provided. Typically, revenue is recognized over time using costs incurred to date because the effort provided by the field selling and service organization represents services provided, which corresponds with the transfer of control. Revenue for leased equipment is accounted for under Topic 842 Leases and recognized on a straight-line basis over the length of the lease contract. Refer to Note 13 for additional information related to lease equipment.

Practical Expedients and Exemptions

The revenue standard can be applied to a portfolio of contracts with similar characteristics if it is reasonable that the effects of applying the standard at the portfolio would not be significantly different than applying the standard at the individual contract level. The Company applies the portfolio approach primarily within each operating segment by geographical region. Application of the portfolio approach was focused on those characteristics that have the most significant accounting consequences in terms of their effect on the timing of revenue recognition or the amount of revenue recognized. The Company determined the key criteria to assess with respect to the portfolio approach, including the related deliverables, the characteristics of the customers and the timing and transfer of goods and services, which most closely aligned within the operating segments. In addition, the accountability for the business operations, as well as the operational decisions on how to go to market and the product offerings, are performed at the operating segment level.

The following table shows principal activities, separated by reportable segments, from which the Company generates its revenue. For more information about the Company's reportable segments, refer to Note 18.

Net sales at public exchange rates by reportable segment are as follows:

(millions)	2019	2018	2017
Global Industrial			
Product and sold equipment	\$4,819.1	\$4,626.2	\$4,305.3
Service and lease equipment	681.6	660.3	612.7
Global Institutional			
Product and sold equipment	4,433.5	4,415.4	4,136.2
Service and lease equipment	753.5	683.1	640.0
Global Energy			
Product and sold equipment	2,898.7	3,004.4	2,837.5
Service and lease equipment	419.0	416.7	392.5
Other			
Product and sold equipment	87.6	82.6	152.8
Service and lease equipment	813.3	779.5	758.9
Total			
Total product and sold equipment	\$12,238.9	\$12,128.6	\$11,431.8
Total service and lease equipment	2,667.4	2,539.6	2,404.1

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Net sales at public exchange rates by geographic region are as follows:

(millions)	Global Industrial			Global Institutional		
	2019	2018	2017	2019	2018	2017
United States	\$2,374.4	\$2,269.7	\$2,087.8	\$3,403.1	\$3,279.2	\$3,107.2
Europe	1,358.7	1,288.4	1,183.0	988.8	1,038.4	928.8
Asia Pacific	708.1	685.8	661.4	256.1	250.4	237.1
Latin America	497.7	474.3	448.0	166.7	165.6	163.6
Greater China	267.5	278.4	267.0	120.6	113.8	102.1
Canada	148.3	148.9	137.4	192.3	191.6	175.3
Middle East and Africa ("MEA")	146.0	141.0	133.4	59.4	59.5	62.1
Total	\$5,500.7	\$5,286.5	\$4,918.0	\$5,187.0	\$5,098.5	\$4,776.2

(millions)	Global Energy			Other		
	2019	2018	2017	2019	2018	2017
United States	\$1,604.1	\$1,630.1	\$1,481.1	\$601.7	\$569.2	\$648.2
Europe	405.2	398.4	404.4	136.1	133.1	119.5
Asia Pacific	247.9	262.7	253.1	40.3	40.2	33.6
Latin America	212.3	219.7	239.3	47.6	46.7	44.8
Greater China	79.4	76.5	70.5	55.7	50.5	45.0
Canada	298.8	335.6	322.3	9.1	11.5	9.4
MEA	470.0	498.1	459.3	10.4	10.9	11.2
Total	\$3,317.7	\$3,421.1	\$3,230.0	\$900.9	\$862.1	\$911.7

Net sales by geographic region were determined based on origin of sale. There were no sales from a single foreign country or individual customer that were material to the Company's consolidated net sales. Sales of warewashing products were approximately 11% of consolidated net sales in 2019, 2018 and 2017.

Contract Liability

Payments received from customers are based on invoices or billing schedules as established in contracts with customers. Accounts receivable are recorded when the right to consideration becomes unconditional. The contract liability relates to billings in advance of performance (primarily service obligations) under the contract. Contract liabilities are recognized as revenue when the performance obligation has been performed, which primarily occurs during the subsequent quarter.

(millions)	December 31 2019	December 31 2018
Contract liability as of beginning of the year	\$75.8	\$79.0
Revenue recognized in the year from: Amounts included in the contract liability at the beginning of the year	(75.8)	(79.0)
Increases due to billings excluding amounts recognized as revenue during the year ended	78.2	74.3
Business combinations	6.5	1.5
Contract liability as of end of year	\$84.7	\$75.8

18. OPERATING SEGMENTS AND GEOGRAPHIC INFORMATION

The Company's organizational structure consists of global business unit and global regional leadership teams. The Company's eleven operating segments follow its commercial and product-based activities and are based on engagement in business activities, availability of discrete financial information and review of operating results by the Chief Operating Decision Maker at the identified operating segment level.

Nine of the Company's eleven operating segments have been aggregated into three reportable segments based on similar economic characteristics and future prospects, nature of the products and production processes, end-use markets, channels of distribution and regulatory environment. The Company's reportable segments are Global Industrial, Global Institutional and Global Energy. Operating segments that do not meet the quantitative criteria to be separately reported have been combined into Other. The Company provides similar information for Other as compared to its three reportable segments as the Company considers the information regarding its two underlying operating segments as useful in understanding its consolidated results.

The Company's eleven operating segments are aggregated as follows:

Global Industrial

Includes the Water, Food & Beverage, Paper, Life Sciences and Textile Care operating segments. It provides water treatment and process applications, and cleaning and sanitizing solutions primarily to large industrial customers within the manufacturing, food and beverage processing, chemical, mining and primary metals, power generation, pulp and paper, and commercial laundry industries. The underlying operating segments exhibit similar manufacturing processes, distribution methods and economic characteristics.

Global Institutional

Includes the Institutional, Specialty and Healthcare operating segments. It provides specialized cleaning and sanitizing products to the foodservice, hospitality, lodging, healthcare, government and education and retail industries. The underlying operating segments exhibit similar manufacturing processes, distribution methods and economic characteristics.

Global Energy

Includes the Energy operating segment. It serves the process chemicals and water treatment needs of the global petroleum and petrochemical industries in both upstream and downstream applications.

Other

Includes the Pest Elimination operating segment which provides services to detect, eliminate and prevent pests, such as rodents and insects and the CTG operating segment which produces and sells colloidal silica, which is comprised of nano-sized particles of silica in water used primarily for binding and polishing applications.

Corporate

Consistent with the Company's internal management reporting, Corporate amounts in the table above include intangible asset amortization specifically from the Nalco merger and special (gains) and charges, as discussed in Note 3, that are not allocated to the Company's reportable segments.

Comparability of Reportable Segments

The Company evaluates the performance of its non-U.S. dollar functional currency international operations based on fixed currency exchange rates, which eliminate the impact of exchange rate fluctuations on its international operations. Fixed currency amounts are updated annually at the beginning of each year based on translation into U.S. dollars at foreign currency exchange rates established by management, with all periods presented using such rates. The "Fixed Currency Rate Change" column shown in the following table reflects the impact on previously reported values related to fixed currency exchange rates established by management at the beginning of 2019. The "Other" column in the table reflects immaterial changes between segments, primarily cost allocations. Further information related to the Company's special (gains) and charges is included in Note 3.

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The impact of the preceding changes on previously reported full year 2018 and 2017 reportable segment net sales and operating income is summarized as follows:

(millions)	December 31, 2018			
	2018 Reported Valued at 2018 Management Rates	Other	Fixed Currency Rate Change	2018 Revised Valued at 2019 Management Rates
Net Sales				
Global Industrial	\$5,462.4	\$-	\$(242.2)	\$5,220.2
Global Institutional	5,204.5	-	(138.5)	5,066.0
Global Energy	3,501.8	-	(113.0)	3,388.8
Other	877.6	-	(21.9)	855.7
Subtotal at fixed currency rates	15,046.3	-	(515.6)	14,530.7
Effect of foreign currency translation	(378.1)	-	515.6	137.5
Consolidated reported GAAP net sales	\$14,668.2	\$-	\$-	\$14,668.2
Operating Income				
Global Industrial	\$768.1	\$(1.4)	\$(42.3)	\$724.4
Global Institutional	1,026.9	-	(19.6)	1,007.3
Global Energy	358.5	(0.4)	(19.6)	338.5
Other	161.3	1.8	(3.1)	160.0
Corporate	(307.1)	-	3.5	(303.6)
Subtotal at fixed currency rates	2,007.7	-	(81.1)	1,926.6
Effect of foreign currency translation	(60.7)	-	81.1	20.4
Consolidated reported GAAP operating income	\$1,947.0	\$-	\$-	\$1,947.0
December 31, 2017				
(millions)	2017 Reported Valued at 2018 Management Rates	Other	Fixed Currency Rate Change	2017 Revised Valued at 2019 Management Rates
Net Sales				
Global Industrial	\$5,106.8	\$-	\$(211.0)	\$4,895.8
Global Institutional	4,910.0	-	(124.2)	4,785.8
Global Energy	3,281.7	-	(75.9)	3,205.8
Other	931.5	-	(20.8)	910.7
Subtotal at fixed currency rates	14,230.0	-	(431.9)	13,798.1
Effect of foreign currency translation	(394.1)	-	431.9	37.8
Consolidated reported GAAP net sales	\$13,835.9	\$-	\$-	\$13,835.9
Operating Income				
Global Industrial	\$758.5	\$(0.8)	\$(35.7)	\$722.0
Global Institutional	979.8	(0.5)	(16.6)	962.7
Global Energy	336.1	0.2	(13.4)	322.9
Other	142.5	1.1	(2.9)	140.7
Corporate	(213.9)	-	3.6	(210.3)
Subtotal at fixed currency rates	2,003.0	-	(65.0)	1,938.0
Effect of foreign currency translation	(52.9)	-	65.0	12.1
Consolidated reported GAAP operating income	\$1,950.1	\$-	\$-	\$1,950.1

Reportable Segment Information

Financial information for each of the Company's reportable segments is as follows:

(millions)	Net Sales			Operating Income (Loss)		
	2019	2018	2017	2019	2018	2017
Global Industrial	\$5,569.9	\$5,220.2	\$4,895.8	\$854.7	\$724.4	\$722.0
Global Institutional	5,235.5	5,066.0	4,785.8	1,042.2	1,007.3	962.7
Global Energy	3,334.0	3,388.8	3,205.8	379.1	338.5	322.9
Other	907.5	855.7	910.7	167.3	160.0	140.7
Corporate	-	-	-	(409.1)	(303.6)	(210.3)
Subtotal at fixed currency	15,046.9	14,530.7	13,798.1	2,034.2	1,926.6	1,938.0
Effect of foreign currency translation	(140.6)	137.5	37.8	(20.4)	20.4	12.1
Consolidated	\$14,906.3	\$14,668.2	\$13,835.9	\$2,013.8	\$1,947.0	\$1,950.1

The profitability of the Company's operating segments is evaluated by management based on operating income.

The Company has an integrated supply chain function that serves all of its reportable segments. As such, asset and capital expenditure information by reportable segment has not been provided and is not available, since the Company does not produce or utilize such information internally. In addition, although depreciation and amortization expense is a component of each reportable segment's operating results, it is not discretely identifiable.

Geographic Information

Long-lived assets at public exchange rates by geographic region are as follows:

(millions)	Long-Lived Assets, net	
	2019	2018
United States	\$9,223.6	\$9,175.4
Europe	2,641.6	2,538.7
Asia Pacific, excluding Greater China	1,015.1	1,003.4
Latin America	522.4	565.8
MEA	299.2	302.1
Canada	598.1	616.8
Greater China	1,163.1	1,194.6
Total	\$15,463.1	\$15,396.8

Geographic data for long-lived assets is based on physical location of those assets. Refer to Note 17 for net sales by geographic region.

19. QUARTERLY FINANCIAL DATA (UNAUDITED)

(millions, except per share)	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
2019					
Net sales	\$3,505.4	\$3,759.4	\$3,817.9	\$3,823.6	\$14,906.3
Operating expenses					
Cost of sales (a)	2,089.6	2,208.2	2,207.4	2,218.2	8,723.4
Selling, general and administrative expenses	1,008.3	1,002.7	962.5	984.0	3,957.5
Special (gains) and charges	40.3	49.9	60.4	61.0	211.6
Operating income	367.2	498.6	587.6	560.4	2,013.8
Other (income) expense (a)	(21.2)	(20.9)	(20.8)	(13.4)	(76.3)
Interest expense, net (a)	49.4	49.5	46.1	46.2	191.2
Income before income taxes	339.0	470.0	562.3	527.6	1,898.9
Provision for income taxes	38.6	97.8	93.0	93.3	322.7
Net income including noncontrolling interest	300.4	372.2	469.3	434.3	1,576.2
Net income attributable to noncontrolling interest	3.9	3.6	5.1	4.7	17.3
Net income attributable to Ecolab	\$296.5	\$368.6	\$464.2	\$429.6	\$1,558.9
Earnings attributable to Ecolab per common share					
Basic	\$ 1.03	\$ 1.28	\$ 1.61	\$ 1.49	\$ 5.41
Diluted	\$ 1.01	\$ 1.26	\$ 1.59	\$ 1.47	\$ 5.33
Weighted-average common shares outstanding					
Basic	288.2	287.6	288.1	288.3	288.1
Diluted	292.3	292.1	292.8	292.6	292.5
2018					
Net sales	\$3,470.9	\$3,689.6	\$3,747.2	\$3,760.5	\$14,668.2
Operating expenses					
Cost of sales (a)	2,072.3	2,146.1	2,190.7	2,216.8	8,625.9
Selling, general and administrative expenses	1,018.3	1,036.8	964.7	948.8	3,968.6
Special (gains) and charges	26.0	12.1	75.6	13.0	126.7
Operating income	354.3	494.6	516.2	581.9	1,947.0
Other (income) expense	(19.4)	(19.6)	(21.0)	(19.9)	(79.9)
Interest expense, net (a)	56.4	56.3	55.7	53.9	222.3
Income before income taxes	317.3	457.9	481.5	547.9	1,804.6
Provision for income taxes	69.1	104.3	43.2	147.7	364.3
Net income including noncontrolling interest	248.2	353.6	438.3	400.2	1,440.3
Net income attributable to noncontrolling interest	0.9	2.3	2.9	5.1	11.2
Net income attributable to Ecolab	\$247.3	\$351.3	\$435.4	\$395.1	\$1,429.1
Earnings attributable to Ecolab per common share					
Basic	\$ 0.86	\$ 1.22	\$ 1.51	\$ 1.37	\$ 4.95
Diluted	\$ 0.84	\$ 1.20	\$ 1.48	\$ 1.35	\$ 4.88
Weighted-average common shares outstanding					
Basic	288.6	288.8	288.8	288.0	288.6
Diluted	292.7	293.3	293.4	292.2	292.8

Per share amounts do not necessarily sum due to changes in the calculation of shares outstanding for each discrete period and rounding. Gross profit is calculated as net sales minus cost of sales. The Company has conformed the first quarter of 2019 with current accounting policies. There was no impact to net sales or operating income.

- (a) Cost of sales includes special charges of \$3.6, \$7.9, \$11.3 and \$15.7 million in Q1, Q2, Q3 and Q4 of 2019, respectively and \$(0.1), \$3.6, and \$5.8 million in Q2, Q3 and Q4 of 2018, respectively. Other (income) expense includes special charges of \$9.5 million in Q4 of 2019. Net interest expense includes special charges of \$0.2 million in Q1 of 2019 and \$0.3 million in Q4 of 2018.

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[Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.](#)

None.

[Item 9A. Controls and Procedures.](#)

Disclosure Controls and Procedures

As of December 31, 2019, we carried out an evaluation, under the supervision and with the participation of our management, including our Chairman of the Board and Chief Executive Officer and our Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures (as such term is defined in Rule 13a-15(e) under the Securities Exchange Act of 1934 as amended). Based upon that evaluation, our Chairman of the Board and Chief Executive Officer and our Chief Financial Officer concluded that our disclosure controls and procedures are effective.

Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Under the supervision and with the participation of our management, including our Chairman of the Board and Chief Executive Officer and our Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the 2013 framework in *Internal Control – Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under this framework, our management concluded that our internal control over financial reporting was effective as of December 31, 2019.

The Company's independent registered public accounting firm, PricewaterhouseCoopers LLP, has audited the effectiveness of the Company's internal control over financial reporting as of December 31, 2019. Their report, and our management reports, can be found in Item 8 of Part II of this Form 10-K.

During the period October 1 - December 31, 2019 there were no changes in our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

We are continuing our implementation of our enterprise resource planning ("ERP") system upgrades, which are expected to occur in phases over the next several years. These upgrades, which include supply chain and certain finance functions, are expected to improve the efficiency of certain financial and related transactional processes. We are also making changes to our system in order to support our separation of the ChampionX business. These upgrades of the ERP systems will affect the processes that constitute our internal control over financial reporting and will require testing for effectiveness.

[Item 9B. Other Information.](#)

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Information about our directors is incorporated by reference from the discussion under the heading "Proposal 1: Election of Directors" located in the Proxy Statement. Information about compliance with Section 16(a) of the Securities Exchange Act of 1934, as amended, is incorporated by reference from the discussion under the heading "Delinquent Section 16(a) Reports" located in the Proxy Statement. Information about our Audit Committee, including the members of the Committee, and our Audit Committee financial experts, is incorporated by reference from the discussion under the heading "Corporate Governance," and sub-headings "Board Committees" and "Audit Committee," located in the Proxy Statement. Information about our Code of Conduct is incorporated by reference from the discussion under the heading "Corporate Governance Materials and Code of Conduct" located in the Proxy Statement. Information regarding our executive officers is presented under the heading "Information about our Executive Officers" in Part I, Item 1 of this Form 10-K, and is incorporated herein by reference.

Item 11. Executive Compensation.

Information appearing under the following headings of the Proxy Statement is incorporated herein by reference:

- Director Compensation for 2019
- Compensation Risk Analysis
- Compensation Committee Interlocks and Insider Participation
- Compensation Committee Report
- Compensation Discussion and Analysis
- Summary Compensation Table for 2019
- Grants of Plan-Based Awards for 2019
- Outstanding Equity Awards at Fiscal Year-End for 2019
- Option Exercises and Stock Vested for 2019
- Pension Benefits for 2019
- Non-Qualified Deferred Compensation for 2019
- Potential Payments Upon Termination or Change in Control
- Pay Ratio Disclosure

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[Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.](#)

Information appearing under the heading entitled “Security Ownership” located in the Proxy Statement is incorporated herein by reference.

A total of 1,345,984 shares of Common Stock held by our directors and executive officers, some of whom may be deemed to be “affiliates” of the Company, have been excluded from the computation of market value of our Common Stock on the cover page of this Form 10-K. This total represents that portion of the shares reported as beneficially owned by our directors and executive officers as of June 30, 2019 which are actually issued and outstanding.

Equity Compensation Plan Information

Plan Category	(a) Number of securities to be issued upon exercise of outstanding options, warrants and rights	(b) Weighted average exercise price of outstanding options, warrants and rights	(c) Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))
Equity compensation plans approved by security holders	10,597,473 (1)	\$ 122.19 (1)	9,029,645
Equity compensation plans not approved by security holders	63,187 (2)	55.59 (2)	-
Total	<u>10,660,660</u>	<u>\$ 121.72</u>	<u>9,029,645</u>

- (1) Includes 235,929 Common Stock equivalents representing deferred compensation stock units earned by non-employee directors under our 2001 Non-Employee Director Stock Option and Deferred Compensation Plan, 1,116,898 Common Stock equivalents under our 2010 Stock Incentive Plan representing performance-based restricted stock units payable to employees, and 265,513 Common Stock equivalents under our 2010 Stock Incentive Plan representing restricted stock units payable to employees. All of the Common Stock equivalents described in this footnote (1) are not included in the calculation of weighted average exercise price of outstanding options, warrants and rights in column (b) of this table. The reported amount additionally includes 22,479 shares of Common Stock subject to stock options assumed by us in connection with the Nalco merger. Such options, which have a weighted-average exercise price of \$37.34, are included in the calculation of weighted average exercise price of outstanding options, warrants and rights in column (b) of this table.
- (2) The reported amount represents shares of our Common Stock which were formerly reserved for future issuance under the Amended and Restated Nalco Holding Company 2004 Stock Incentive Plan (the “rollover shares”) and granted to legacy Nalco associates on December 1, 2011, under the Ecolab Inc. 2010 Stock Incentive Plan in the form of stock options. These rollover shares are deemed exempt from shareholder approval under Rule 303A.08 of the New York Stock Exchange in accordance with our notice to the New York Stock Exchange dated December 16, 2011. The Nalco plan was amended to prohibit future grants.

[Item 13. Certain Relationships and Related Transactions, and Director Independence.](#)

Information appearing under the headings entitled “Director Independence Standards and Determinations” and “Related Person Transactions” located in the Proxy Statement is incorporated herein by reference.

[Item 14. Principal Accounting Fees and Services.](#)

Information appearing under the heading entitled “Audit Fees” located in the Proxy Statement is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

The following information required under this item is filed as part of this report:

(a)(1) Financial Statements.

Document:	Page:
(i) Report of Independent Registered Public Accounting Firm.	50
(ii) Consolidated Statements of Income for the years ended December 31, 2019, 2018 and 2017.	52
(iii) Consolidated Statements of Comprehensive Income for the years ended December 31, 2019, 2018 and 2017.	53
(iv) Consolidated Balance Sheets at December 31, 2019 and 2018.	54
(v) Consolidated Statements of Cash Flows for the years ended December 31, 2019, 2018 and 2017.	55
(vi) Consolidated Statements of Equity for the years ended December 31, 2019, 2018 and 2017.	56
(vii) Notes to Consolidated Financial Statements.	57

Exhibit No.:	Document:	Method of Filing:
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(a)(2) Financial Statement Schedules.

All financial statement schedules are omitted because they are not applicable or the required information is shown in the consolidated financial statements or the accompanying notes to the consolidated financial statements. The separate financial statements and summarized financial information of subsidiaries not consolidated and of fifty percent or less owned persons have been omitted because they do not satisfy the requirements for inclusion in this Form 10-K.

(a)(3) The documents below are filed as exhibits to this Report. We will, upon request and payment of a fee not exceeding the rate at which copies are available from the Securities and Exchange Commission, furnish copies of any of the following exhibits to stockholders.

(2.1)	Agreement and Plan of Merger and Reorganization, dated December 18, 2019, by and among Ecolab Inc., ChampionX Holding Inc., Apergy Corporation and Athena Merger Sub. Inc.	Incorporated by reference to Exhibit (2.1) of our Form 8-K, dated December 18, 2019. (File No. 001-9328)
(2.2)	Separation and Distribution Agreement, dated December 18, 2019, by and among Ecolab Inc., ChampionX Holding Inc. and Apergy Corporation	Incorporated by reference to Exhibit (2.1) of our Form 8-K, dated December 18, 2019. (File No. 001-9328)
(3.1)	Restated Certificate of Incorporation of Ecolab Inc., dated January 2, 2013.	Incorporated by reference to Exhibit (3.2) of our Form 8-K, dated January 2, 2013. (File No. 001-9328)
(3.2)	By-Laws, as amended through December 3, 2015.	Incorporated by reference to Exhibit (3.1) of our Form 8-K, dated December 3, 2015. (File No. 001-9328)
(4.1)	Common Stock.	See Exhibits (3.1) and (3.2)
(4.2)	Form of Common Stock Certificate effective October 2, 2017	Incorporated by reference to Exhibit (4.1) of our Form 10-Q Quarterly Report for the quarter ended September 30, 2017. (File No. 001-9328)

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Exhibit No.:	Document:	Method of Filing:
(4.3)	Amended and Restated Indenture, dated January 9, 2001, between Ecolab Inc. and The Bank of New York Trust Company, N.A. (as successor in interest to J.P. Morgan Trust Company, N.A. and Bank One, N.A.), as Trustee.	Incorporated by reference to Exhibit (4)(A) of our Form 8-K, dated January 23, 2001. (File No. 001-9328)
(4.4)	Second Supplemental Indenture, dated December 8, 2011, between Ecolab Inc., Wells Fargo Bank, National Association, as Trustee and the Bank of New York Mellon Trust Company, N.A. (formerly known as The Bank of New York Trust Company, N.A., as successor in interest to J.P. Morgan Trust Company, N.A. and Bank One, N.A.), as original trustee.	Incorporated by reference to Exhibit (4.2) of our Form 8-K, dated December 5, 2011. (File No. 001-9328)
(4.5)	Forms of 4.350% Notes due 2021 and 5.500% Notes due 2041.	Included in Exhibit (4.4) above.
(4.6)	Indenture, dated January 12, 2015, between Ecolab Inc. and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit 4.1 of our Form 8-K, dated January 15, 2015. (File No. 001-9328)
(4.7)	Second Supplemental Indenture, dated July 8, 2015, by and among Ecolab Inc., Wells Fargo Bank, National Association, as Trustee, Elavon Financial Services Limited, UK Branch, as paying agent, and Elavon Financial Services Limited, as transfer agent and registrar.	Incorporated by reference to Exhibit (4.2) of our Form 8-K, dated July 8, 2015. (File No. 001-9328)
(4.8)	Form of 2.625% Euro Notes due 2025.	Included in Exhibit (4.7) above.
(4.9)	Third Supplemental Indenture, dated January 14, 2016, between Ecolab Inc. and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit (4.2) of our Form 8-K, dated January 11, 2016. (File No. 001-9328)
(4.10)	Form of 3.250% Notes due 2023.	Included in Exhibit (4.9) above.
(4.11)	Fourth Supplemental Indenture, dated October 18, 2016, between Ecolab Inc. and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit (4.2) of our Form 8-K, dated October 13, 2016. (File No. 001-9328)
(4.12)	Forms of 2.700% Notes due 2026 and 3.700% Notes due 2046.	Included in Exhibit (4.11) above.
(4.13)	Fifth Supplemental Indenture, dated December 8, 2016, by and among Ecolab Inc., Wells Fargo Bank, National Association, as Trustee, Elavon Financial Services DAC, UK Branch, as paying agent, and Elavon Financial Services DAC, as transfer agent and registrar.	Incorporated by reference to Exhibit (4.2) of our Form 8-K, dated December 1, 2016. (File No. 001-9328)
(4.14)	Form of 1.000% Euro Notes due 2024.	Included in Exhibit (4.13) above.
(4.15)	Sixth Supplemental Indenture, dated August 10, 2017, between Ecolab Inc. and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit (4.2) of our Form 8-K, dated August 10, 2017. (File No. 001-9328)
(4.16)	Form of 2.375% Notes due 2022.	Included in Exhibit (4.15) above.
(4.17)	Seventh Supplemental Indenture, dated November 27, 2017, between Ecolab Inc. and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit (4.2) of our Form 8-K, dated November 30, 2017. (File No. 001-9328)
(4.18)	Form of 3.250% Notes due 2027.	Included in Exhibit (4.17) above.
(4.19)	Form of 3.950% Notes due 2047.	Included in Exhibit (4.17) above.
(4.20)	Description of Securities	Filed herewith electronically.

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Exhibit No.:	Document:	Method of Filing:
	Copies of other constituent instruments defining the rights of holders of our long-term debt are not filed herewith, pursuant to Section (b)(4)(iii) of Item 601 of Regulation S-K, because the aggregate amount of securities authorized under each of such instruments is less than 10% of our total assets on a consolidated basis. We will, upon request by the Securities and Exchange Commission, furnish to the Commission a copy of each such instrument.	
(10.1)(i)	Second Amended and Restated \$2.0 billion 5-Year Revolving Credit Facility, dated November 28, 2017, among Ecolab Inc., the lenders party thereto, the issuing banks party thereto, Bank of America, N.A., as administrative agent and swing line bank, and Citibank, N.A., JPMorgan Chase Bank, N.A. and The Bank of Tokyo-Mitsubishi UFJ, Ltd., as co-syndication agents.	Incorporated by reference to Exhibit (10.1) of our Form 8-K, dated November 30, 2017. (File No. 001-9328)
(10.2)	Note Purchase Agreement, dated October 27, 2011, by and among Ecolab Inc. and the Purchasers party thereto.	Incorporated by reference to Exhibit (10.1) of our Form 8-K, dated October 27, 2011. (File No. 001-9328)
(10.3)	Documents comprising global Commercial Paper Programs.	
	(i) U.S. \$2,000,000,000 Euro-Commercial Paper Programme.	
	(a) Amended and Restated Dealer Agreement, dated 9 June 2017, between Ecolab Inc., Ecolab Lux 1 S.A.R.L., Ecolab Lux 2 S.A.R.L., Ecolab NL 10 B.V. and Ecolab NL 11 B.V. (as Issuers), Ecolab Inc. (as Guarantor in respect of the notes issued by Ecolab Lux 1 S.A.R.L., Ecolab Lux 2 S.A.R.L., Ecolab NL 10 B.V. and Ecolab NL 11 B.V.), Credit Suisse Securities (Europe) Limited (as Arranger), and Citibank Europe plc, UK Branch and Credit Suisse Securities (Europe) Limited (as Dealers).	Incorporated by reference to Exhibit (10.1)(a) of our Form 10-Q for the quarter ended June 30, 2017. (File No. 001-9328)
	(b) Amended and Restated Note Agency Agreement, dated 9 June 2017, between Ecolab Inc., Ecolab Lux 1 S.A.R.L., Ecolab Lux 2 S.A.R.L., Ecolab NL 10 B.V. Ecolab NL 11 B.V. (as Issuers), Ecolab Inc. (as Guarantor in respect of the notes issued by Ecolab Lux 1 S.A.R.L., Ecolab Lux 2 S.A.R.L., Ecolab NL 10 B.V. and Ecolab NL 11 B.V.), and Citibank, N.A., London Branch (as Issue and Paying Agent).	Incorporated by reference to Exhibit (10.1)(b) of our Form 10-Q for the quarter ended June 30, 2017. (File No. 001-9328)
	(c) Deed of Covenant made on 9 June 2017 by Ecolab Inc., Ecolab Lux 1 S.A.R.L., Ecolab Lux 2 S.A.R.L., Ecolab NL 10 B.V. and Ecolab NL 11 B.V. (as Issuers)	Incorporated by reference to Exhibit (10.1)(c) of our Form 10-Q for the quarter ended June 30, 2017. (File No. 001-9328)
	(d) Deed of Guarantee made on 9 June 2017 by Ecolab Inc. (in respect of notes issued by Ecolab Lux 1 S.A.R.L., Ecolab Lux 2 S.A.R.L., Ecolab NL 10 B.V. and Ecolab NL 11 B.V.)	Incorporated by reference to Exhibit (10.1)(d) of our Form 10-Q for the quarter ended June 30, 2017. (File No. 001-9328)
	(ii) U.S. \$2,000,000,000 U.S. Commercial Paper Program.	
	(a) Form of Commercial Paper Dealer Agreement for 4(a)(2) Program, dated September 22, 2014. The dealers for the program are Barclays Capital Inc., Citigroup Global Markets Inc., Credit Suisse Securities (USA) LLC, BofA Securities, Inc., Mizuho Securities USA LLC, and Wells Fargo Securities, LLC.	Incorporated by reference to Exhibit (10.1)(a) of our Form 10-Q for the quarter ended September 30, 2014. (File No. 001-9328)

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Exhibit No.:	Document:	Method of Filing:
	(b) Issuing and Paying Agency Agreement, dated September 18, 2017, between Ecolab Inc. and MUFG Union Bank, N.A., as Issuing and Paying Agent.	Incorporated by reference to Exhibit (10.1)(a) of our Form 10-Q for the quarter ended September 30, 2017. (File No. 001-9328)
	(c) Corporate Commercial Paper – Master Note, dated September 18, 2017, together with annex thereto.	Incorporated by reference to Exhibit (10.1)(b) of our Form 10-Q for the quarter ended September 30, 2017. (File No. 001-9328)
(10.4)	† (i) Ecolab Inc. 2001 Non-Employee Director Stock Option and Deferred Compensation Plan, as amended and restated, effective as of August 1, 2013.	Incorporated by reference to Exhibit (10.6) of our Form 10-K Annual Report for the year ended December 31, 2013. (File No. 001-9328)
	† (ii) Declaration of Amendment, dated May 5, 2016, to Ecolab Inc. 2001 Non-Employee Director Stock Option and Deferred Compensation Plan, as amended and restated, effective as of August 1, 2013.	Incorporated by reference to Exhibit (10.1) of our Form 10-Q for the quarter ended June 30, 2016. (File No. 001-9328)
	† (iii) Master Agreement Relating to Periodic Options, as amended, effective as of May 1, 2004.	Incorporated by reference to Exhibit (10)D(ii) of our Form 10-Q for the quarter ended June 30, 2004. (File No. 001-9328)
	† (iv) Amendment No. 1 to Master Agreement Relating to Periodic Options, as amended, effective as of May 2, 2008.	Incorporated by reference to Exhibit (10)B of our Form 10-Q for the quarter ended September 30, 2008. (File No. 001-9328)
(10.5)	(i) Note Purchase Agreement, dated July 26, 2006, by and among Ecolab Inc. and the Purchasers party thereto.	Incorporated by reference to Exhibit (10) of our Form 8-K, dated July 26, 2006. (File No. 001-9328)
	(ii) First Amendment, dated October 27, 2011, to Note Purchase Agreement, dated July 26, 2006, by and among Ecolab Inc. and the Noteholders party thereto.	Incorporated by reference to Exhibit (10.2) of our Form 8-K, dated October 27, 2011. (File No. 001-9328)
(10.6)	† Form of Director Indemnification Agreement. Substantially identical agreements are in effect as to each of our directors.	Incorporated by reference to Exhibit (10)I of our Form 10-K Annual Report for the year ended December 31, 2003. (File No. 001-9328)
(10.7)	† (i) Ecolab Executive Death Benefits Plan, as amended and restated, effective as of March 1, 1994.	Incorporated by reference to Exhibit (10)H(i) of our Form 10-K Annual Report for the year ended December 31, 2006. See also Exhibit (10.12) hereof. (File No. 001-9328)
	† (ii) Amendment No. 1 to Ecolab Executive Death Benefits Plan, effective as of July 1, 1997.	Incorporated by reference to Exhibit (10)H(ii) of our Form 10-K Annual Report for the year ended December 31, 1998. (File No. 001-9328)
	† (iii) Second Declaration of Amendment to Ecolab Executive Death Benefits Plan, effective as of March 1, 1998.	Incorporated by reference to Exhibit (10)H(iii) of our Form 10-K Annual Report for the year ended December 31, 1998. (File No. 001-9328)
	† (iv) Amendment No. 3 to the Ecolab Executive Death Benefits Plan, effective as of August 12, 2005.	Incorporated by reference to Exhibit (10)B of our Form 8-K, dated December 13, 2005. (File No. 001-9328)
	† (v) Amendment No. 4 to the Ecolab Executive Death Benefits Plan, effective as of January 1, 2005.	Incorporated by reference to Exhibit (10)H(v) of our Form 10-K Annual Report for the year ended December 31, 2009. (File No. 001-9328)
	† (vi) Amendment No. 5 to the Ecolab Executive Death Benefits Plan, effective as of May 6, 2015.	Incorporated by reference to Exhibit 10.2 of our Form 10-Q for the quarter ended June 30, 2015. (File No. 001-9328)

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Exhibit No.:	Document:	Method of Filing:
	† (vii) Amendment No. 6 to the Ecolab Executive Death Benefits Plan, effective as of June 23, 2017	Incorporated by reference to Exhibit 10.1(vii) of Ecolab's Form 8-K dated June 23, 2017. (File No. 001-9328)
(10.8)	† (i) Ecolab Executive Long-Term Disability Plan, as amended and restated, effective as of January 1, 1994.	Incorporated by reference to Exhibit (10)I of our Form 10-K Annual Report for the year ended December 31, 2004. See also Exhibit (10.12) hereof. (File No. 001-9328).
	† (ii) Amendment No. 1 to the Ecolab Executive Long-Term Disability Plan, effective as of August 21, 2015.	Incorporated by reference to Exhibit 10.1 of our Form 10-Q for the quarter ended September 30, 2015. (File No. 001-9328)
(10.9)	† (i) Ecolab Supplemental Executive Retirement Plan, as amended and restated, effective as of January 1, 2014.	Incorporated by reference to Exhibit 10.11 of our Form 10-K Annual Report for the year ended December 31, 2013. See also Exhibit (10.12) hereof. (File No. 001-9328).
	† (ii) Amendment No. 1 to the Ecolab Supplemental Executive Retirement Plan, effective as of May 6, 2015.	Incorporated by reference to Exhibit 10.1 of our Form 10-Q for the quarter ended June 30, 2015. (File No. 001-9328)
(10.10)	† Ecolab Mirror Savings Plan, as amended and restated, effective as of January 1, 2014.	Incorporated by reference to Exhibit 10.12 of our Form 10-K Annual Report for the year ended December 31, 2013. See also Exhibit (10.12) hereof. (File No. 001-9328)
(10.11)	† Ecolab Mirror Pension Plan, as amended and restated, effective as of January 1, 2014.	Incorporated by reference to Exhibit 10.13 of our Form 10-K Annual Report for the year ended December 31, 2013. See also Exhibit (10.12) hereof. (File No. 001-9328).
(10.12)	† (i) Ecolab Inc. Administrative Document for Non-Qualified Plans, as amended and restated, effective as of January 1, 2011.	Incorporated by reference to Exhibit (10.16) of our Form 10-K Annual Report for the year ended December 31, 2011. (File No. 001-9328)
	† (ii) Amendment No. 1 to the Ecolab Inc. Administrative Document for Non-Qualified Plans, effective as of January 1, 2013.	Incorporated by reference to Exhibit (10.14)(II) of our Form 10-K Annual Report for the year ended December 31, 2013. (File No. 001-9328)
(10.13)	† (i) Ecolab Inc. Change in Control Severance Compensation Policy, as amended and restated, effective as of February 26, 2010.	Incorporated by reference to Exhibit (10) of our Form 8-K, dated February 26, 2010. (File No. 001-9328)
	† (ii) Amendment No. 1 to Ecolab Inc. Change-in-Control Severance Policy, as amended and restated, effective as of February 26, 2010.	Incorporated by reference to Exhibit (10.18)(ii) of our Form 10-K Annual Report for the year ended December 31, 2011. (File No. 001-9328)
(10.14)	† Description of Ecolab Management Incentive Plan.	Incorporated by reference to Exhibit (10.16) of our Form 10-K Annual Report for the year ended December 31, 2015. (File No. 001-9328)
(10.15)	† (i) Ecolab Inc. 2010 Stock Incentive Plan, as amended and restated, effective as of May 2, 2013.	Incorporated by reference to Exhibit (10.1) of our Form 8-K, dated May 2, 2013. (File No. 001-9328)
	† (ii) Declaration of Amendment, effective as of February 22, 2019, to Ecolab Inc. 2010 Stock Incentive Plan, as amended and restated, effective as of May 2, 2013.	Incorporated by reference to Exhibit (10.3) of our Form 10-Q, dated May 2, 2019. (File No. 001-9328)
	† (iii) Sample form of Non-Statutory Stock Option Agreement under the Ecolab Inc. 2010 Stock Incentive Plan, adopted May 6, 2010.	Incorporated by reference to Exhibit (10)B of our Form 8-K, dated May 6, 2010. (File No. 001-9328)

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Exhibit No.:	Document:	Method of Filing:
† (iv)	Sample form of Restricted Stock Award Agreement under the Ecolab Inc. 2010 Stock Incentive Plan, adopted May 6, 2010.	Incorporated by reference to Exhibit (10)C of our Form 8-K, dated May 6, 2010. (File No. 001-9328)
† (v)	Sample form of Restricted Stock Unit Award Agreement under the Ecolab Inc. 2010 Stock Incentive Plan, adopted August 4, 2010.	Incorporated by reference to Exhibit (10)A of our Form 10-Q, for the quarter ended September 30, 2010. (File No. 001-9328)
† (vi)	Sample form of Performance-Based Restricted Stock Unit Award Agreement under the Ecolab Inc. 2010 Stock Incentive Plan, adopted December 7, 2016.	Incorporated by reference to Exhibit (10.16)(vii) of our Form 10-K Annual Report for the year ended December 31, 2016. (File No. 001-9328)
† (vii)	Sample form of Performance-Based Restricted Stock Unit Award Agreement under the Ecolab Inc. 2010 Stock Incentive Plan, adopted December 6, 2017.	Incorporated by reference to Exhibit (10.16)(viii) of our Form 10-K Annual Report for the year ended December 31, 2017. (File No. 001-9328)
† (viii)	Sample form of Performance-Based Restricted Stock Unit Award Agreement under the Ecolab Inc. 2010 Stock Incentive Plan, adopted December 4, 2018.	Incorporated by reference to Exhibit (10.15)(viii) of our Form 10-K Annual Report for the year ended December 31, 2018. (File No. 001-9328)
† (ix)	Sample form of Performance-Based Restricted Stock Unit Award Agreement under the Ecolab Inc. 2010 Stock Incentive Plan, adopted December 3, 2019.	Filed herewith electronically.
† (x)	Sample form of Restricted Stock Unit Award Agreement under the Ecolab Inc. 2010 Stock Incentive Plan, adopted December 3, 2019.	Filed herewith electronically.
(10.16)	† Policy on Reimbursement of Incentive Payments, as amended February 22, 2019.	Incorporated by reference to Exhibit (10.16) of our Form 10-K Annual Report for the year ended December 31, 2018. (File No. 001-9328)
(10.17)	† Second Amended and Restated Nalco Holding Company 2004 Stock Incentive Plan, effective as of December 1, 2011.	Incorporated by reference to Exhibit (4.3) of our Post-Effective Amendment No. 1 on Form S-8 to Form S-4 Registration Statement dated December 2, 2011. (File No. 001-9328)
(10.18)	† Form of Nalco Company Death Benefit Agreement and Addendum to Death Benefit Agreement.	Incorporated by reference from Exhibit (99.2) on Form 8-K of Nalco Holding Company filed on May 11, 2005. (File No. 001-32342)
(10.19)	† Employee Matters Agreement, dated December 18, 2019, by and among Ecolab, Inc., ChampionX Holding Inc. and Apergy Corporation.	Incorporated by reference to Exhibit (10.1) of our Form 8-K, dated December 18, 2019. (File No. 001-9328)
(14.1)	Ecolab Code of Conduct, as amended November 26, 2012.	Incorporated by reference to Exhibit (14.1) of our Form 10-K Annual Report for the year ended December 31, 2012. (File No. 001-9328)
(21.1)	List of Subsidiaries.	Filed herewith electronically.
(23.1)	Consent of Independent Registered Public Accounting Firm.	Filed herewith electronically.
(24.1)	Powers of Attorney.	Filed herewith electronically.
(31.1)	Rule 13a-14(a) CEO Certification.	Filed herewith electronically.
(31.2)	Rule 13a-14(a) CFO Certification.	Filed herewith electronically.
(32.1)	Section 1350 CEO and CFO Certifications.	Filed herewith electronically.

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Exhibit No.:	Document:	Method of Filing:
(101.INS)	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.	Filed herewith electronically.
(101.SCH)	Inline XBRL Taxonomy Extension Schema.	Filed herewith electronically.
(101.CAL)	Inline XBRL Taxonomy Extension Calculation Linkbase.	Filed herewith electronically.
(101.DEF)	Inline XBRL Taxonomy Extension Definition Linkbase.	Filed herewith electronically.
(101.LAB)	Inline XBRL Taxonomy Extension Label Linkbase.	Filed herewith electronically.
(101.PRE)	Inline XBRL Taxonomy Extension Presentation Linkbase.	Filed herewith electronically.
(104)	Cover Page Interactive Data File.	Formatted as Inline XBRL and contained in Exhibit 101.

† This exhibit is an executive compensation plan or arrangement.

[Item 16. Form 10-K Summary.](#)

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Ecolab Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, on the 28th day of February, 2020.

ECOLAB INC.
(Registrant)

By: /s/ Douglas M. Baker, Jr.
Douglas M. Baker, Jr.
Chairman of the Board
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Ecolab Inc. and in the capacities indicated, on the 28th day of February, 2020.

/s/ Douglas M. Baker, Jr. Chairman of the Board and Chief Executive Officer
Douglas M. Baker, Jr. (Principal Executive Officer and Director)

/s/ Daniel J. Schmechel Chief Financial Officer
Daniel J. Schmechel (Principal Financial Officer)

/s/ Scott D. Kirkland Senior Vice President and Corporate Controller
Scott D. Kirkland (duly authorized officer and Chief Accounting Officer)

/s/ Michael C. McCormick Directors
Michael C. McCormick

as attorney-in-fact for:
Shari L. Ballard, Barbara J. Beck, Les S. Biller, Jeffrey M. Ettinger,
Arthur J. Higgins, Michael Larson, David W. MacLennan, Tracy B.
McKibben, Lionel L. Nowell, III, Victoria J. Reich, Suzanne M.
Vautrinot and John J. Zillmer

Description of Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934

As of December 31, 2019, Ecolab Inc., a Delaware corporation (“Ecolab,” “we,” “our,” “us,” “the Company”), has three classes of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended: (i) its common stock, \$1.00 par value per share, (ii) its 2.625% Euro Notes due 2025, and (iii) its 1.000% Euro Notes due 2024.

1. COMMON STOCK, \$1.00 PAR VALUE

The following description of Ecolab common stock is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to Ecolab’s Restated Certificate of Incorporation dated January 2, 2013 (the “Certificate of Incorporation”) and Ecolab’s Bylaws as amended through December 3, 2015 (the “Bylaws”), each of which are incorporated by reference as an exhibit to the Annual Report on Form 10-K of which this Exhibit 4.20 is a part. We encourage you to read our Restated Certificate of Incorporation, our Bylaws and the applicable provisions of the Delaware General Corporation Law, Title 8, Chapter 1 of the Delaware Code (“DGCL”) for additional information.

Authorized Capital Stock

Under Ecolab’s Certificate of Incorporation, Ecolab’s authorized capital stock consists of 800,000,000 shares of common stock, par value \$1.00 per share, and 15,000,000 shares of preferred stock, no par value.

Common Stock

Under Ecolab’s Bylaws, the holders of common stock are entitled to one vote for each share held of record on all matters submitted to a vote of stockholders.

Ecolab’s Bylaws establish that directors shall be elected by the vote of the majority of the votes cast at any meeting for the election of directors at which a quorum is present; provided, however, that directors shall be elected by a plurality of the votes cast at any meeting of stockholders for which (i) Ecolab’s Secretary receives a notice that a stockholder has nominated a person for election to the Board of Directors in compliance with either (A) the advance notice requirements set forth in Ecolab’s Bylaws (as described below) or (B) the requirements for stockholder nominees for directors set forth in Ecolab’s Bylaws (as described below) and (ii) such nomination has not been withdrawn by such stockholder on or prior to the 10th day preceding the date Ecolab first mails its notice of meeting for such meeting to the stockholders. For purposes of electing directors, a majority of votes cast shall mean that the number of shares voted “for” a nominee exceeds 50% of the number of votes cast with respect to such nominee. Votes cast with respect to a nominee shall include votes to withhold authority and exclude abstentions with respect to such nominee.

Subject to preferences which may be applicable to any outstanding preferred stock, holders of common stock are entitled to receive ratably such dividends as may be declared by the board of directors out of funds legally available therefor. In the event of our liquidation or dissolution, holders of common stock are entitled to share ratably in all assets remaining after payment of liabilities and the liquidation preference of any outstanding preferred stock.

Holders of common stock have no preemptive rights and have no rights to convert their common stock into any other securities. Ecolab common stock is not redeemable.

Preferred Stock

Our board of directors is authorized without further action of the stockholders to issue preferred stock in one or more series and may fix the designations and the powers, preferences and rights of the preferred stock. No class of preferred stock is currently outstanding.

Certain Provisions under Ecolab’s Certificate of Incorporation, Bylaws and the DGCL

State Antitakeover Statute

Ecolab is subject to Section 203 of the DGCL, which regulates corporate takeovers and generally prohibits a publicly-held Delaware corporation from engaging in a business combination, such as a merger, with a person or group owning 15% or more of the corporation’s voting stock for a period of three years following the time the person became an interested stockholder, unless (with certain exceptions) the business combination or the transaction in which the person became an interested stockholder is approved in a prescribed manner.

Number and Classification of the Board of Directors

Ecolab’s Certificate of Incorporation and Bylaws provide that the Ecolab Board of Directors shall consist of a number of directors, which number shall be determined from time to time exclusively by Ecolab’s Board of Directors pursuant to a resolution adopted by affirmative vote of a majority of Ecolab’s entire Board of Directors. All directors are elected for a one-year term expiring at the next annual meeting of stockholders. Pursuant to such procedures, Ecolab’s Board of Directors is not classified.

Removal of Directors

Under Ecolab's Certificate of Incorporation and Bylaws, any director may be removed at any time, at a special meeting of the stockholders called and held for the purpose, by the affirmative vote of the holders of a majority of the shares then entitled to vote at an election of directors.

Vacancies on the Board of Directors

Ecolab's Certificate of Incorporation and Bylaws provide newly created directorships and vacancies in the Board of Directors, however occurring, may be filled only by a majority vote of the directors then in office (even if less than a quorum), and shall not be filled by the stockholders.

Amendment of Restated Certificate of Incorporation

The DGCL generally permits the adoption of amendments to the Certificate of Incorporation if those amendments are approved and declared advisable by the board of directors of the corporation and adopted by the holders of a majority of the outstanding shares of stock of the corporation, unless the Certificate of Incorporation requires a greater vote.

Amendment of By-Laws

Under Ecolab's Certificate of Incorporation and Bylaws, the Ecolab Board of Directors may, by vote of a majority of its members, alter, amend or rescind all or any of its Bylaws, as permitted by law, subject to the power of the stockholders to change or repeal a particular bylaw.

Special Meetings of Stockholders

Under Ecolab's Bylaws, special meetings of the Ecolab stockholders may be called at any time by Ecolab's Board of Directors or by the Chairman of the Ecolab Board, and shall be called by the Chairman of the Ecolab Board, Ecolab's President or Secretary at the written request of the majority of Ecolab's Board of Directors or at the written request of stockholders owning capital stock having 25% of the voting power of the entire issued and outstanding capital stock of Ecolab. Such request shall state the purpose or purposes of the proposed meeting. No business shall be transacted at any special meeting of the stockholders except that stated in the notice of the meeting.

Action by Written Consent

Ecolab's Bylaws provide that any action required or permitted to be taken at any annual or special meeting of stockholders, may be taken without a meeting, without prior notice and without a vote, if a consent in writing, setting forth the action so taken, shall be signed by the holders of outstanding Ecolab stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote thereon were present and voted.

Advance Notice Requirements of Stockholder Nominations and Proposals

Under Ecolab's Bylaws, stockholders who wish to make a proposal or nominate directors at an annual meeting of stockholders must notify Ecolab no later than the 120th day nor earlier than the 150th day prior to the first anniversary of the date of the preceding year's annual meeting. However, in the event that an annual meeting is called for on a date that is more than 30 days before or after the first anniversary of the preceding year's annual meeting, then, in order to be timely, a stockholder's notice must be received not later than the close of business on the earlier of the 10th day following the day on which notice of the date of such annual meeting was mailed or the date on which Ecolab first publicly announces the date of such annual meeting.

In the case of a special meeting of stockholders for the purpose of electing directors, a nominating stockholder must give notice not later than the close of business on the 10th day following the day on which notice of the date of the special meeting was mailed or public disclosure of the date of the special meeting was made, whichever first occurs. In no event shall the public disclosure of an adjournment of an annual meeting commence a new time period for the giving of a stockholder's notice as described above.

A stockholder's notice must set forth the information required by Ecolab's Bylaws with respect to each matter the stockholder proposes to bring before an annual or special meeting.

Whenever the Ecolab Board of Directors solicits proxies with respect to the election of directors at an annual meeting of stockholders, Ecolab shall include in its proxy statement for such annual meeting, in addition to any persons nominated for election by or at the direction of the Ecolab Board of Directors, the name, together with other required information, of any person nominated for election to the Board of Directors by an eligible stockholder who expressly elects at the time of providing the required notice to have such nominee included in Ecolab's proxy materials.

In order to qualify as an eligible stockholder, such stockholder must be a stockholder or a group of no more than 20 stockholders that (i) has owned (and continues to own through the date of the annual meeting) at least 3% of the number of outstanding shares of Ecolab's stock continuously for at least three years as of the date the notice of proxy access nomination is received by Ecolab's Secretary and (ii) satisfies all of the other requirements with respect to proxy access as set forth in Ecolab's Bylaws.

Limitation of Personal Liability of Directors

Ecolab's Certificate of Incorporation provides that the directors of Ecolab will not be personally liable to Ecolab or its stockholders for monetary damages for breach of fiduciary duty as a director; provided, however, that the Certificate of Incorporation shall not eliminate or limit the liability of a director to the extent provided by applicable law (i) for any breach of the director's duty of loyalty to Ecolab or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the DGCL, or (iv) for any transaction from which the director derived an improper personal benefit.

Indemnification of Directors, Officers and Employees

Ecolab's Bylaws provide that every person who was or is a party or is threatened to be made a party to or is involved in any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that he is or was a director or officer of Ecolab, while a director or officer of Ecolab, is or was serving at the request of Ecolab or for its benefit as a director, officer, employee or agent of another corporation, or as its representative in a partnership, joint venture, trust or other enterprise, including any employee benefit plan, shall be indemnified and held harmless by Ecolab to the fullest extent legally permissible under the DGCL in the manner prescribed therein, from time to time, against all expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by him in connection therewith. Similar indemnification shall be provided by Ecolab to an employee of Ecolab or one of its subsidiaries who was or is a party or is threatened to be made a party to or is involved in any threatened, pending or completed action, suit or proceeding, by reason of the fact that he is or was serving for the benefit of Ecolab as a director or officer of another corporation or as Ecolab's representative in a partnership, joint venture, trust or other enterprise, including any employee benefit plan.

Exclusive Forum

Ecolab's Bylaws provide that, unless Ecolab consents in writing to the selection of alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of Ecolab, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer, stockholder, employee or agent of Ecolab to Ecolab or Ecolab's stockholders, (iii) any action asserting a claim against Ecolab or any director, officer, stockholder, employee or agent of Ecolab arising out of or relating to any provision of the DGCL or Ecolab's Certificate of Incorporation or Ecolab's Bylaws or, or (iv) any action asserting a claim against Ecolab or any director, officer, stockholder, employee or agent of Ecolab governed by the internal affairs doctrine of the State of Delaware; provided, however, that, in the event that the Court of Chancery of the State of Delaware lacks subject matter jurisdiction over any such action or proceeding, the sole and exclusive forum for such action or proceeding shall be another state or federal court located within the State of Delaware, in each such case, unless the Court of Chancery (or such other state or federal court located within the State of Delaware, as applicable) has dismissed a prior action by the same plaintiff asserting the same claims because such court lacked personal jurisdiction over an indispensable party named as a defendant therein.

Under Ecolab's Bylaws, this forum selection provision will apply to state and federal law claims, including claims under the federal securities laws, although Ecolab's stockholders will not be deemed to have waived Ecolab's compliance with the federal securities laws and the rules and regulations thereunder. It is possible that a court could find the forum selection provisions contained in Ecolab's Bylaws to be inapplicable or unenforceable.

Listing

Our common stock is listed and traded on the New York Stock Exchange under the symbol "ECL".

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare Trust Company, N.A. Its address for general inquiries delivered by regular mail is P.O. Box 505000, Louisville, KY 40233 and for courier services, registered mail or overnight deliveries it is 462 South 4th Street, Suite 1600, Louisville, KY 40202. Its toll-free number is (800) 322-8325.

2. 2.625% EURO NOTES DUE 2025

The following description of the Ecolab 2.625% Euro Notes due 2025 is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to the Indenture, dated January 12, 2015, between the Company and Wells Fargo Bank, National Association, and the Second Supplemental Indenture, dated as of July 8, 2015, by and among the Company, Wells Fargo Bank, National Association, Elavon Financial Services Limited, UK Branch, as paying agent, and Elavon Financial Services Limited, as transfer agent and registrar (such Indenture and Second Supplemental Indenture referred to, respectively, as the "base indenture" and the "supplemental indenture" and, collectively, as the "indenture" in the description below), each of which are incorporated by reference as an exhibit to the Annual Report on Form 10-K of which this Exhibit 4.20 is a part. We encourage you to read the base indenture and the supplemental indenture for additional information.

General

The notes were issued under an indenture, dated as of January 12, 2015, between us and Wells Fargo Bank, National Association, as trustee (the "base indenture"). Certain terms of the notes are contained in a second supplemental indenture (the "supplemental indenture" and, together with the base indenture, the "indenture"), among us, Wells Fargo Bank, National Association, as trustee, and certain other parties.

The notes are our senior unsecured obligations and rank equally in right of payment to our other senior debt from time to time outstanding. The notes are structurally subordinated to all liabilities of our subsidiaries, including trade payables. Since we conduct many of our operations through our subsidiaries, our right to participate in any distribution of the assets of a subsidiary when it winds up its business is subject to the prior claims of the creditors of the subsidiary. This means that a holder of our notes will also be subject to the prior claims of these creditors if a subsidiary liquidates or reorganizes or otherwise winds up its business. Unless we are considered a creditor of the subsidiary, a holder's claims will be recognized behind these creditors.

The indenture does not limit the amount of notes, debentures or other evidences of indebtedness that we may issue under the indenture and provides that notes, debentures or other evidences of indebtedness may be issued from time to time in one or more series. We may from time to time, without giving notice to or seeking the consent of the holders of the notes offered hereby, issue additional debt securities having the same terms (except for the issue date and, in some cases, the public offering price and the first interest payment date) and ranking equally and ratably with the notes offered hereby. Any additional debt securities having such similar terms, together with the notes offered hereby, will constitute a single series of securities under the indenture.

The notes were initially issued in €575,000,000 aggregate principal amount and will mature on July 8, 2025. The notes bear interest at the rate of 2.625% per year from the date of original issuance, or from the most recent interest payment date to which interest has been paid or provided for. Interest on the notes accrued from July 8, 2015. We make interest payments on the notes annually in arrears on July 8 of each year, commencing July 8, 2016. Payment of interest on the notes on any interest payment date is made to the person in whose name such note (or predecessor note) is registered (which shall initially be the common depository) at the close of business on the business day immediately preceding such interest payment date (the record date with respect to the notes). Interest on the notes is computed on the basis of the actual number of days in the period for which interest is being calculated and the actual number of days from and including the last date on which interest was paid on the notes (or from July 8, 2015, if no interest has been paid on the notes) to but excluding the next scheduled interest payment date. This payment convention is referred to as ACTUAL/ACTUAL (ICMA) (as defined in the rulebook of the International Capital Market Association).

If an interest payment date or the maturity date with respect to the notes falls on a day that is not a business day, the payment is made on the next business day as if it were made on the date the payment was due, and no interest will accrue on the amount so payable for the period from and after that interest payment date or the maturity date, as the case may be, to the date the payment is made. Interest payment for the notes includes accrued interest from and including the date of issue or from and including the last date in respect of which interest has been paid, as the case may be, to, but excluding, the interest payment date or the date of maturity, as the case may be.

For purposes of the notes, "business day" means any day, other than a Saturday or Sunday, (1) which is not a day on which banking institutions in The City of New York or London are authorized or required by law, regulation or executive order to close and (2) on which the Trans-European Automated Real-Time Gross Settlement Express Transfer system (the TARGET2 system), or any successor thereto, is open.

The notes were issued only in registered book-entry form, in minimum denominations of €100,000 and integral multiples of €1,000 in excess thereof.

Issuance in Euro

Initial holders were required to pay for the notes in euros, and all payments of principal of, and premium or redemption price, if any, and interest on the notes, is made in euros.

If the euro is unavailable to us due to the imposition of exchange controls or other circumstances beyond our control or the euro is no longer used by the then member states of the European Monetary Union that have adopted the euro as their currency or for the settlement of transactions by public institutions within the international banking community, then all payments in respect of the notes will be made in U.S. dollars until the euro is again available to us or so used. In such circumstances, the amount payable on any date in euros will be converted to U.S. dollars on the basis of the Market Exchange Rate (as defined below) on the second business day before the date that payment is due, or if such Market Exchange Rate is not then available, on the basis of the most recently available Market Exchange Rate on or before the date that payment is due. Any payment in respect of the notes so made in U.S. dollars will not constitute an event of default under the indenture. Neither the trustee nor the Paying Agent will be responsible for obtaining exchange rates, effecting conversions or otherwise handling redenominations. "Market Exchange Rate" means the noon buying rate in The City of New York for cable transfers of euros as certified for customs purposes (or, if not so certified, as otherwise determined) by the Federal Reserve Bank of New York. Investors are subject to foreign exchange risks as to payments of principal and interest that may have important economic and tax consequences to them. See "Risk Factors."

Optional Redemption

The notes are redeemable, at any time in whole or from time to time in part, in each case at our option, at a redemption price equal to the greater of:

- (i) 100% of the principal amount of the notes to be redeemed on that redemption date; and
 - (ii) the sum of the present values of the remaining scheduled payments of principal and interest on the notes to be redeemed (exclusive of interest accrued to the redemption date), discounted to the redemption date on an annual basis (ACTUAL/ACTUAL (ICMA)) at the applicable Comparable Government Bond Rate plus 30 basis points,
- plus, in each case, accrued and unpaid interest, if any, to but excluding the redemption date.

Notwithstanding the foregoing, if the notes are redeemed on or after April 8, 2025 (three months prior to their maturity), the redemption price will be 100% of the principal amount of the notes to be redeemed, plus accrued and unpaid interest, if any, to but excluding the redemption date.

Notwithstanding the foregoing, installments of interest on notes that are due and payable on interest payment dates falling on or prior to a redemption date will be payable on the interest payment date to the registered holders as of the close of business on the relevant record date according to the notes and the indenture.

"*Comparable Government Bond*" means, in relation to any Comparable Government Bond Rate calculation, at the discretion of an Independent Investment Banker, a German government bond whose maturity is closest to the maturity of the notes to be redeemed, or if the Independent Investment Banker in its discretion determines that such similar bond is not in issue, such other German government bond as such Independent Investment Banker may, with the advice of the Reference Bond Dealers, determine to be appropriate for determining the Comparable Government Bond Rate.

"*Comparable Government Bond Rate*" means the price, expressed as a percentage (rounded to three decimal places, with 0.0005 being rounded upwards), at which the gross redemption yield on the notes to be redeemed, if they were to be purchased at such price on the third business day prior to the date fixed for redemption, would be equal to the gross redemption yield on such business day of the Comparable Government Bond on the basis of the middle market price of the Comparable Government Bond prevailing at 11:00 a.m. (London time) on such business day as determined by an Independent Investment Banker.

"Independent Investment Banker" means one of the Reference Bond Dealers that we appoint to act as the Independent Investment Banker from time to time.

"Reference Bond Dealer" means each of Credit Suisse Securities (Europe) Limited and Merrill Lynch International and their successors, and any other firm that is a broker of, and/or market maker in German government bonds (each a "Primary Bond Dealer") which we specify from time to time; provided, however, that if any of them ceases to be a Primary Bond Dealer, we will substitute another Primary Bond Dealer.

Notice of any redemption will be delivered at least 30 days but not more than 60 days before the redemption date to each registered holder of the notes to be redeemed (with a copy to the trustee and the paying agent) by us; provided that notice of redemption may be delivered more than 60 days prior to a redemption date if the notice is issued in connection with a defeasance of the notes or a satisfaction and discharge of the notes. Once notice of redemption is delivered, the notes called for redemption will become due and payable on the redemption date and at the applicable redemption price, plus accrued and unpaid interest to, but excluding, the redemption date.

Unless we default in payment of the redemption price, on and after the redemption date, interest will cease to accrue on the notes or portions thereof called for redemption. On or before the redemption date, we will deposit with a paying agent (or the trustee) money sufficient to pay the redemption price of and accrued interest on the notes to be redeemed on that date. If less than all of the notes are to be redeemed, the notes to be redeemed will be selected by the registrar in accordance with applicable procedures of Clearstream or Euroclear.

Payment of Additional Amounts

All payments in respect of the notes will be made by or on behalf of us without withholding or deduction for, or on account of, any present or future taxes, duties, assessments or governmental charges of whatever nature, imposed or levied by the United States or any taxing authority thereof or therein, unless such withholding or deduction is required by law. If such withholding or deduction is required by law, we or a paying agent will pay to a holder who is not a United States person such additional amounts on the notes as are necessary in order that the net payment by us or a paying agent of the principal of, and premium or redemption price, if any, and interest on, the notes to such holder, after such withholding or deduction, will not be less than the amount provided in the notes to be then due and payable; provided, however, that the foregoing obligation to pay additional amounts will not apply:

- (1) to any tax, assessment or other governmental charge that would not have been imposed but for the holder, or a fiduciary, settlor, beneficiary, member or shareholder of the holder if the holder is an estate, trust, partnership or corporation, or a person holding a power over an estate or trust administered by a fiduciary holder, being considered as:
 - a. being or having been engaged in a trade or business in the United States or having or having had a permanent establishment in the United States or having or having had a qualified business unit which has the United States dollar as its functional currency;
 - b. having a current or former connection with the United States (other than a connection arising solely as a result of the ownership of the notes, the receipt of any payment or the enforcement of any rights thereunder) or being considered as having such relationship, including being or having been a citizen or resident of the United States;
 - c. being or having been a personal holding company, a passive foreign investment company or a controlled foreign corporation with respect to the United States or a foreign personal holding company that has accumulated earnings to avoid United States federal income tax;
 - d. being or having been an owner of a 10% or greater interest in the capital or profits of the Company within the meaning of Section 871(h)(3) of the U.S. Internal Revenue Code of 1986, as amended (the "Code") or any successor provision; or
 - e. being a bank receiving payments on an extension of credit made pursuant to a loan agreement entered into in the ordinary course of its trade or business;
- (2) to any holder that is not the sole beneficial owner of the notes, or a portion of the notes, or that is a fiduciary, partnership or limited liability company, but only to the extent that a beneficiary or settlor with respect to the fiduciary, a beneficial owner or member of the partnership or limited liability company would not have been entitled to the payment of an additional amount had the beneficiary, settlor, beneficial owner or member received directly its beneficial or distributive share of the payment;
- (3) to any tax, assessment or other governmental charge that would not have been imposed but for the failure of the holder or any other person to comply with certification, identification or information reporting requirements concerning the nationality, residence, identity or connection with the United States of the holder or beneficial owner of the notes, if compliance is required by statute, by regulation of the United States or any taxing authority therein or by an applicable income tax treaty to which the United States is a party as a precondition to exemption from such tax, assessment or other governmental charge;
- (4) to any tax, assessment or other governmental charge that is imposed otherwise than by withholding by us or a paying agent from the payment;
- (5) to any tax, assessment or other governmental charge that would not have been imposed but for a change in law, regulation, or administrative or judicial interpretation that becomes effective more than 15 days after the payment becomes due or is duly provided for, whichever occurs later;
- (6) to any estate, inheritance, gift, sales, excise, transfer, wealth, capital gains or personal property tax or similar tax, assessment or other governmental charge;

- (7) to any withholding or deduction that is imposed on a payment to an individual and that is required to be made pursuant to European Council Directive 2003/48/EC on the taxation of savings income or any other Directive amending, supplementing or replacing such Directive, or any law implementing or complying with, or introduced in order to conform to, such Directive or Directives;
- (8) to any tax, assessment or other governmental charge required to be withheld by any paying agent from any payment of principal of or interest on any note, if such payment can be made without such withholding by at least one other paying agent;
- (9) to any tax, assessment or other governmental charge that would not have been imposed but for the presentation by the holder of any note, where presentation is required, for payment on a date more than 30 days after the date on which payment became due and payable or the date on which payment thereof is duly provided for, whichever occurs later;
- (10) to any withholding or deduction that is imposed on a payment pursuant to Sections 1471 through 1474 of the Code and related Treasury regulations and pronouncements (the "Foreign Account Tax Compliance Act") or any successor provisions and any regulations or official law, agreement or interpretations thereof in any jurisdiction implementing an intergovernmental approach thereto; or
- (11) in the case of any combination of items (1), (2), (3), (4), (5), (6), (7), (8), (9) and (10).

The notes are subject in all cases to any tax, fiscal or other law or regulation or administrative or judicial interpretation applicable to the notes. Except as specifically provided under this heading "—Payment of Additional Amounts," we will not be required to make any payment for any tax, duty, assessment or governmental charge of whatever nature imposed by any government or a political subdivision or taxing authority of or in any government or political subdivision.

As used under this heading "—Payment of Additional Amounts" and under the heading "—Redemption for Tax Reasons," the term "United States" means the United States of America (including the States and the District of Columbia), its territories and its possessions and other areas subject to its jurisdiction, and the term "United States person" means any individual who is a citizen or resident of the United States for U.S. federal income tax purposes, a corporation, partnership or other entity created or organized in or under the laws of the United States, any state of the United States or the District of Columbia, including an entity treated as a corporation for United States income tax purposes, or any estate or trust the income of which is subject to United States federal income taxation regardless of its source.

Redemption for Tax Reasons

If, as a result of any change in, or amendment to, the laws (or any regulations or rulings promulgated under the laws) of the United States (or any taxing authority thereof or therein), or any change in, or amendments to, an official position regarding the application or interpretation of such laws, regulations or rulings, which change or amendment is announced or becomes effective on or after July 1, 2015, we become or, based upon a written opinion of independent counsel of recognized standing selected by us, will become obligated to pay additional amounts as described herein under the heading "—Payment of Additional Amounts" with respect to the notes, then we may at our option, having given not less than 30 nor more than 60 days prior notice to holders, redeem, in whole, but not in part, the notes at a redemption price equal to 100% of the principal amount of the notes being redeemed, together with accrued and unpaid interest on such notes to, but excluding, the redemption date.

Sinking Fund

The notes are not entitled to any sinking fund.

Offer to Repurchase upon a Change of Control Repurchase Event

If a Change of Control Repurchase Event (as defined below) occurs, unless we have exercised our right to redeem the notes in whole as described above, we will make an offer to each holder to repurchase all or any part (equal to €100,000 and integral multiples of €1,000 in excess thereof) of that holder's notes at a repurchase price in cash equal to 101% of the aggregate principal amount of notes repurchased plus any accrued and unpaid interest on the notes repurchased to the date of repurchase.

Within 30 days following any Change of Control Repurchase Event or, at our option, prior to any Change of Control (as defined below), but after the public announcement of the transaction or transactions that constitutes or may constitute a Change of Control, we will mail a notice to each holder, with a copy to the trustee and the paying agent, describing the transaction or transactions that constitute or may constitute the Change of Control Repurchase Event and offering to repurchase notes on the payment date specified in the notice, which date will be no earlier than 30 days and no later than 60 days from the date such notice is mailed. The notice shall, if mailed prior to the date of consummation of the Change of Control, state that the offer to purchase is conditioned on the Change of Control Repurchase Event occurring on or prior to the payment date specified in the notice.

We will comply with the requirements of Rule 14e-1 under the Exchange Act and any other securities laws and regulations thereunder, to the extent those laws and regulations are applicable in connection with the repurchase of the notes as a result of a Change of Control Repurchase Event. To the extent that the provisions of any securities laws or regulations conflict with the Change of Control Repurchase Event provisions of the notes, we will comply with the applicable securities laws and regulations and will not be deemed to have breached our obligations under the Change of Control Repurchase Event provisions of the notes by virtue of such conflict.

On the Change of Control Repurchase Event payment date, we will, to the extent lawful:

- accept for payment all notes or portions of notes properly tendered pursuant to our offer;
- deposit with the paying agent an amount equal to the aggregate purchase price in respect of all notes or portions of notes properly tendered; and
- deliver or cause to be delivered to the trustee the notes properly accepted, together with an officers' certificate stating the aggregate principal amount of notes being repurchased by us.

The paying agent will promptly deliver to each holder of notes properly tendered the purchase price for the notes, and the trustee will promptly authenticate and mail (or cause to be transferred by book-entry) to each holder a new note equal in principal amount to any unpurchased portion of any notes surrendered; provided, that each new note will be in a principal amount of €100,000 or integral multiples of €1,000 above that amount.

We will not be required to make an offer to repurchase the notes upon a Change of Control Repurchase Event if a third party makes such an offer in the manner, at the times and otherwise in compliance with the requirements for an offer made by us and such third party purchases all notes properly tendered and not withdrawn under its offer.

The definition of "Change of Control" includes a phrase relating to the direct or indirect sale, transfer, conveyance or other disposition of "all or substantially all" of our assets and those of our subsidiaries, taken as a whole. Although there is a limited body of case law interpreting the phrase "substantially all," there is no precise established definition of the phrase under applicable law. Accordingly, the ability of a holder of notes to require us to repurchase the notes as a result of a sale, transfer, conveyance or other disposition of less than all of our assets and the assets of our subsidiaries, taken as a whole, to another person or group may be uncertain.

Definitions

"Below Investment Grade Rating Event" means the rating on the notes is lowered by each of the Rating Agencies and the notes are rated below Investment Grade by each of the Rating Agencies on any day within the 60-day period (which 60-day period will be extended so long as the rating of the notes is under publicly announced consideration for a possible downgrade by any of the Rating Agencies) after the earlier of (1) the occurrence of a Change of Control and (2) public notice of the occurrence of a Change of Control or our intention to effect a Change of Control; provided that a Below Investment Grade Rating Event otherwise arising by virtue of a particular reduction in rating will not be deemed to have occurred in respect of a particular Change of Control (and thus will not be deemed a Below Investment Grade Rating Event for purposes of the definition of Change of Control Repurchase Event) if the Rating Agencies making the reduction in rating to which this definition would otherwise apply do not announce or publicly confirm or inform the trustee in writing at its request that the reduction was the result, in whole or in part, of any event or circumstance comprised of or arising as a result of, or in respect of, the applicable Change of Control (whether or not the applicable Change of Control has occurred at the time of the Below Investment Grade Rating Event).

"Change of Control" means the occurrence of any of the following:

- (1) the direct or indirect sale, transfer, conveyance or other disposition (other than by way of merger or consolidation), in one or a series of related transactions, of all or substantially all of our assets and those of our subsidiaries, taken as a whole, to any "person" (as that term is used in Section 13(d)(3) of the Exchange Act), other than us or one of our subsidiaries;
- (2) the first day on which a majority of the members of our Board of Directors are not Continuing Directors; or
- (3) the consummation of any transaction (including, without limitation, any merger or consolidation) the result of which is that any "person" (as that term is used in Section 13(d)(3) of the Exchange Act), other than us or one or more of our wholly-owned subsidiaries, becomes the beneficial owner, directly or indirectly, of more than 50% of the then outstanding number of shares of our Voting Stock.

Notwithstanding the foregoing, a transaction will not be deemed to involve a Change of Control if (1) we become a direct or indirect wholly-owned subsidiary of a holding company and (2)(A) the direct or indirect holders of the voting stock of such holding company immediately following that transaction are substantially the same as the holders of our voting stock immediately prior to that transaction or (B) immediately following that transaction no person (other than a holding company satisfying the requirements of this sentence) is the beneficial owner, directly or indirectly of more than 50% of the voting stock of such holding company. The term "person," as used in this definition, has the meaning given thereto in Section 13(d)(3) of the Exchange Act.

"Change of Control Repurchase Event" means the occurrence of both a Change of Control and a Below Investment Grade Rating Event.

"Continuing Director" means, as of any date of determination, any member of our Board of Directors who (1) was a member of our Board of Directors on the date of the issuance of the notes; or (2) was nominated for election, elected or appointed to our Board of Directors with the approval of a majority of the Continuing Directors who were members of our Board of Directors at the time of such nomination, election or appointment (either by a specific vote or by approval of our proxy statement in which such member was named as a nominee for election as a director).

"Investment Grade" means a rating of Baa3 or better by Moody's (or its equivalent under any successor rating categories of Moody's) and a rating of BBB- or better by S&P (or its equivalent under any successor rating categories of S&P) or the equivalent investment grade credit rating from any additional Rating Agency or Rating Agencies selected by us.

"Moody's" means Moody's Investors Service Inc., a subsidiary of Moody's Corporation, and its successors.

"Rating Agency" means (1) each of Moody's and S&P; and (2) if either Moody's or S&P ceases to rate the notes or fails to make a rating of the notes publicly available for reasons outside of our control, a "nationally recognized statistical rating organization" as defined in Section 3(a)(62) of the Exchange Act, selected by us as a replacement agency for Moody's or S&P, or both, as the case may be.

"S&P" means Standard & Poor's Ratings Services, a division of The McGraw-Hill Companies, Inc., and its successors.

"Voting Stock" of any specified person as of any date means the capital stock of such person that is at the time entitled to vote generally in the election of the board of directors of such person.

Certain Covenants of the Company

You can find the definitions of certain terms used in this section under "—Certain Definitions."

Restrictions on Liens.

The Company will not, and will not permit any Restricted Subsidiary to, issue, assume or guarantee any indebtedness for money borrowed (herein referred to as "Debt") if such Debt is secured by any mortgage, security interest, pledge, lien or other encumbrance (herein referred to as a "mortgage") upon any Operating Property (as defined under "—Certain Definitions" below) of the Company or any Restricted Subsidiary or any shares of stock or Debt of any Restricted Subsidiary, whether owned at the date of the issuance of the notes or thereafter acquired, without effectively securing the notes equally and ratably with such Debt for at least the period such other Debt is so secured unless, after giving effect thereto, the aggregate amount of all Debt so secured (not including Debt permitted in clauses (1) through (7) in the following sentence), together with all Attributable Debt (as defined under "—Certain Definitions" below) in respect of Sale and Leaseback Transactions involving Operating Properties pursuant to clause (2) under "—Restrictions on Sale and Leaseback Transactions" in existence at such time would not exceed 15% of Consolidated Net Tangible Assets (as defined under "—Certain Definitions" below).

The foregoing restriction does not apply to, and therefore will be excluded in computing secured Debt for the purpose of such restriction, Debt secured by:

- (1) mortgages on Operating Property, shares of stock or Debt of any entity existing at the time such entity becomes a Restricted Subsidiary, provided that such mortgages are not incurred in anticipation of such entity's becoming a Restricted Subsidiary;
- (2) mortgages on Operating Property, shares of stock or Debt existing at the time of acquisition thereof by the Company or a Restricted Subsidiary or mortgages thereon to secure the payment of all or any part of the purchase price thereof, or mortgages on Operating Property, shares of stock or Debt to secure any Debt incurred prior to, at the time of, or within 180 days after, the latest of the acquisition thereof or, in the case of Operating Property, the completion of construction, the completion of improvements or the commencement of substantial commercial operation of such Operating Property for the purpose of financing all or any part of the purchase price thereof, such construction or the making of such improvements;
- (3) mortgages to secure Debt owing to the Company or to a Restricted Subsidiary;
- (4) mortgages on Operating Property, shares of stock or Debt existing at the date of the initial issuance of the notes;
- (5) mortgages on Operating Property, shares of stock or Debt of a person existing at the time such person is merged into or consolidated with the Company or a Restricted Subsidiary or at the time of a sale, lease or other disposition of the properties of a person as an entirety or substantially as an entirety to the Company or a Restricted Subsidiary, provided that such mortgage was not incurred in anticipation of such merger or consolidation or sale, lease or other disposition;
- (6) mortgages on Operating Property, shares of stock or Debt in favor of the United States or any state, territory or possession thereof (or the District of Columbia), or any department, agency, instrumentality or political subdivision of the United States or any state, territory or possession thereof (or the District of Columbia), to secure partial, progress, advance or other payments pursuant to any contract or statute or to secure any Debt incurred for the purpose of financing all or any part of the purchase price or the cost of constructing or improving the Operating Property subject to such mortgages; or
- (7) extensions, renewals or replacements, in whole or in part, of any mortgage referred to in the foregoing clauses (1) through (6), provided, however, that the principal amount of Debt secured thereby will not exceed the principal amount of Debt so secured at the time of such extension, renewal or replacement.

Restrictions on Sale and Leaseback Transactions.

Sale and Leaseback Transactions by the Company or any Restricted Subsidiary with a third party of any Operating Property are prohibited (except for temporary leases for a term, including renewals, of not more than 60 months and except for leases between the Company and a Restricted Subsidiary or between Restricted Subsidiaries) unless the net proceeds of such Sale and Leaseback Transactions are at least equal to the fair market value (as determined in good faith by the Board of Directors of the Company) of the Operating Property to be leased and either:

- (1) the Company or such Restricted Subsidiary would (at the time of entering into such arrangement) be entitled, as described in clauses (1) through (7) of the paragraph under the caption "—Restrictions on Liens" herein, without equally and ratably securing the notes, to issue, assume or guarantee Debt secured by a mortgage on such Operating Property;
- (2) the Attributable Debt of the Company and its Restricted Subsidiaries in respect of such Sale and Leaseback Transactions (other than such Sale and Leaseback Transactions as are referred to in clause (1) or (3) of this paragraph), plus the aggregate principal amount of Debt secured by mortgages on Operating Properties then outstanding (excluding any such Debt secured by mortgages described in clauses (1) through (7) of the paragraph under the caption "—Restrictions on Liens" herein) which do not equally and ratably secure the notes, would not exceed 15% of Consolidated Net Tangible Assets; or

- (3) the Company, within 180 days after the sale or transfer, applies or causes a Restricted Subsidiary to apply an amount equal to the greater of the net proceeds of such sale or transfer or fair market value of the Operating Property (as determined in good faith by the Board of Directors of the Company) so sold and leased back at the time of entering into such Sale and Leaseback Transaction to
- (a) retire (other than any mandatory retirement, mandatory repayment or sinking fund payment or by payment at maturity) notes or other Debt of the Company or a Restricted Subsidiary (other than Debt subordinated to the notes) having a Stated Maturity (as defined in the indenture) more than 12 months from the date of such application or which is extendible at the option of the obligor thereon to a date more than 12 months from the date of such application or
 - (b) purchase, construct or develop one or more Operating Properties (other than that involved in such Sale and Leaseback Transaction);

provided that the amount to be so applied pursuant to clause (3) will be reduced by the principal amount of notes delivered within 180 days after such sale or transfer to the Trustee for retirement and cancellation.

Restricted and Unrestricted Subsidiaries

The restrictive provisions described above under “—Certain Covenants of the Company” are applicable to the Company and its Restricted Subsidiaries and do not apply to Unrestricted Subsidiaries. The assets and liabilities of Unrestricted Subsidiaries are not consolidated with those of the Company and its Restricted Subsidiaries in calculating Consolidated Net Tangible Assets under the indenture.

“Unrestricted Subsidiaries” are defined as (1) any Subsidiary substantially all of whose physical properties are located, or substantially all of whose business is carried on, outside the United States and Canada, (2) any finance Subsidiary and (3) any Subsidiary of an Unrestricted Subsidiary. In addition, the Board of Directors may designate any other Subsidiary of the Company (including any newly acquired or newly formed Subsidiary) to be an Unrestricted Subsidiary unless such Subsidiary owns any capital stock of, or owns or holds any mortgage on any Operating Property of, the Company or any Restricted Subsidiary of the Company; provided that the Subsidiary to be so designated has total assets at the time of such designation of \$5 million or less. “Restricted Subsidiaries” are all Subsidiaries other than Unrestricted Subsidiaries.

The term “Subsidiary” means, among other things, any corporation or other entity of which the Company directly or indirectly owns or controls more than 50% of the total voting power of the shares of capital stock (or equivalent) entitled to vote in the election of directors (or equivalent).

Neither the Company nor any Restricted Subsidiary may transfer an Operating Property or shares of stock or Debt of a Restricted Subsidiary to an Unrestricted Subsidiary.

An Unrestricted Subsidiary may not be designated a Restricted Subsidiary unless, after giving effect thereto, the aggregate amount of all Debt of the Company and its Restricted Subsidiaries secured by mortgages which would otherwise be subject to the restrictions described under “—Certain Covenants of the Company—Restrictions on Liens” and the Attributable Debt in respect of all Sale and Leaseback Transactions pursuant to clause (2) under “—Certain Covenants of the Company—Restrictions on Sale and Leaseback Transactions” in existence at such time does not at the time exceed 15% of Consolidated Net Tangible Assets.

Certain Definitions

“Attributable Debt” in respect of a Sale and Leaseback Transaction means, as of any particular time, the present value (discounted at the rate of interest implicit in the terms of the lease involved in the Sale and Leaseback Transaction, as determined in good faith by the Company) of the obligation of the lessee thereunder for net rental payments (excluding, however, any amounts required to be paid by such lessee, whether or not designated as rent or additional rent, on account of maintenance and repairs, services, insurance, taxes, assessments, water rates and similar charges or any amounts required to be paid by such lessee thereunder contingent upon monetary inflation or the amount of sales, maintenance and repairs, insurance, taxes, assessments, water rates or similar charges) during the remaining term of such lease (including any period for which such lease has been extended or may, at the option of the lessor, be extended).

“Consolidated Net Tangible Assets” means the aggregate amount of assets (less applicable reserves and other properly deductible items) of the Company and its Restricted Subsidiaries after deducting therefrom (a) all goodwill, tradenames, trademarks, patents, unamortized debt discount and expense and other like intangibles and (b) all current liabilities (excluding any current liabilities for money borrowed having a maturity of less than 12 months but by its terms being renewable or extendible beyond 12 months from such date at the option of the borrower), all as reflected in the Company's latest audited consolidated balance sheet contained in the Company's most recent annual report to its stockholders prior to the time as of which “Consolidated Net Tangible Assets” will be determined.

“Operating Property” means any manufacturing or processing plant, warehouse or distribution center, together with the land upon which it is situated located within the United States or in Canada and owned and operated now or hereafter by the Company or any Restricted Subsidiary and having a net book value on the date as of which the determination is being made of more than 1.0% of Consolidated Net Tangible Assets other than property which, in the opinion of the Board of Directors of the Company, is not of material importance to the total business conducted by the Company and its Restricted Subsidiaries taken as a whole.

“United States” means the United States of America (including the States and the District of Columbia), its territories and its possessions and other areas subject to its jurisdiction.

Merger, Consolidation and Sale of Assets

The Company will not: (a) consolidate with or merge into another corporation or entity or (b) sell, convey, transfer or lease all or substantially all its assets to another corporation or entity, unless:

- (1) the corporation or entity formed by such consolidation or into which the Company is merged or to which such sale, conveyance, transfer or lease is made is a domestic corporation or entity and expressly assumes, pursuant to a supplemental indenture, all the obligations of the Company under the indenture and the notes; and
- (2) immediately after the completion of the transaction, no default or event of default has occurred and is continuing.

Clause (2) above will not apply to (A) any sale, conveyance, transfer or lease between the Company and one or more of its subsidiaries, (B) any merger of the Company into one of its subsidiaries or (C) any merger of the Company into one of its affiliates for the purpose of reincorporating or reorganizing.

The surviving or successor entity formed by any such consolidation or into which the Company is so merged or to which such sale, conveyance, transfer or lease is made, will succeed to, and be substituted for, and may exercise every right and power of, the Company under the indenture with the same effect as if such successor entity had been named as the Company under the indenture, and after any such transaction, other than a lease, the Company will be relieved of and discharged from all obligations and covenants under the indenture and the notes.

Events of Default

The indenture defines an event of default with respect to the notes as being any one of the following events:

- (1) default for 30 days in any payment of interest on the notes when due;
- (2) default in any payment of principal of the notes when due either at maturity, upon redemption, by declaration or otherwise;
- (3) default for 60 days after appropriate notice in performance of any other covenant or agreement in the indenture applicable to the notes; or
- (4) certain events of bankruptcy, insolvency or reorganization.

If an event of default (other than an event of default described in clause (4) above) occurs and is continuing, the trustee or the holders of not less than 25% in aggregate principal amount of the outstanding notes may declare the principal of and accrued but unpaid interest on such notes to be immediately due and payable. If an event of default described in clause (4) above occurs and is continuing, then the principal amount of and all accrued but unpaid interest on all of the notes will automatically, and without any declaration or any other action on the part of the trustee or any holder, become due and payable immediately.

Any event of default may be waived by the holders of a majority in principal amount of the outstanding notes, except a failure to pay principal of or interest on the notes.

The indenture requires the Company to file annually with the trustee an officer's certificate as to the company's compliance with all conditions and covenants under the indenture. The indenture provides that the trustee will, within 90 days after the occurrence of a default in respect of the notes known by it, transmit by mail to all holders of the notes notice of any default known to the trustee, unless such default has been cured or waived; provided, that the trustee will be protected in withholding notice to the holders of the notes of any default (except in payment of principal or interest or any sinking fund installment) if responsible officers of the trustee in good faith determine it is in the interest of the holders of the notes to do so.

If an event of default occurs and is continuing, the indenture provides that the trustee will be under no obligation to exercise any of its rights or powers under the indenture at the request or direction of the holders of the notes unless such holders have offered to the trustee security or indemnity satisfactory to it. Subject to such provisions for indemnification and certain other rights of the trustee, the indenture provides that the holders of a majority in principal amount of the outstanding notes may direct the time, method and place of conducting any proceeding for any remedy available to the trustee or exercising any trust or power conferred on the trustee with respect to the notes. However, the indenture provides that the trustee need not take any action which would be unduly prejudicial to the holders not joining such direction.

No holder of any note will have any right to institute any proceeding with respect to the indenture or for any remedy thereunder unless (1) such holder has previously given to the trustee written notice of a continuing event of default, (2) the holders of at least 25% in principal amount of the outstanding notes have made a written request, and offered to the trustee security and indemnity satisfactory to it, to institute such proceeding as trustee, (3) the trustee has not received from the holders of a majority in principal amount of the outstanding notes a direction inconsistent with such request within 60 days of such notice, request and offer of indemnity and (4) the trustee has failed to institute such proceeding within that 60-day period. However, the holder of any note will have an absolute right to receive payment of the principal of and interest on such note on or after the due dates expressed in such note and to institute suit for the enforcement of any such payment.

Modification and Waiver

The indenture provides that, with the consent of the holders of a majority in aggregate principal amount of the outstanding notes, the Company and the trustee may enter into an indenture or supplemental indentures for the purpose of modifying or changing the indenture or the rights of the holders of the notes; provided, however, that no such supplemental indenture may, without the consent of the holder of each outstanding note, (1) extend the stated maturity of the principal of, or any installment of interest on, any note, (2) reduce the principal amount of or the interest on or any premium payable upon redemption of any note, (3) change the place of payment where, or the currency in which the principal of and premium, if any, or interest on such note is denominated or payable, (4) alter the provisions with respect to the redemption or repurchase of such note, (5) reduce the amount of the principal of an original issue discount security that would be due and payable upon a declaration of acceleration of maturity, (6) impair the right to institute suit for the enforcement of any payment on or after the stated maturity thereof (or, in the case of redemption, on or after the redemption date), (7) reduce the percentage in principal amount of the outstanding notes that is required for a supplemental indenture or waiver or (8) waive an event of default in the payment of principal of, or interest or premium, if any, on any note.

The holders of at least a majority of the principal amount of the outstanding notes may on behalf of the holders of all the notes waive compliance by the Company with certain restrictive provisions of the indenture.

The indenture also permits the Company and the trustee to amend the indenture in certain circumstances without the consent of the holders of the notes to evidence the merger of the Company or the replacement of the trustee and for certain other purposes.

Legal Defeasance and Covenant Defeasance

The indenture provides that, at the Company's option, either (a) the Company will be deemed to have been discharged from its obligations with respect to the notes on the first day after the applicable conditions set forth below have been satisfied or (b) the Company will be deemed to have effected covenant defeasance with respect to the notes at any time after the applicable conditions set forth below have been satisfied:

- (1) the Company has deposited or caused to be deposited irrevocably with the trustee as trust funds in trust, specifically pledged as security for, and dedicated solely to, the benefit of the holders of the notes (i) money in an amount, or (ii) U.S. government obligations that through the payment of interest and principal in respect thereof in accordance with their terms will provide, not later than one day before the due date of any payment, money in an amount, or (iii) a combination of (i) and (ii), sufficient to pay and discharge each installment of principal of and premium, if any, and interest on, the outstanding notes on the dates such installments of interest or principal and premium are due, accompanied, except in the event of clause (i) of this paragraph, by a report as to the sufficiency of the amount deposited from an independent certified accountant or other financial professional of national standing;
- (2) no default with respect to the notes has occurred and is continuing on the date of such deposit; and
- (3) the Company has delivered to the trustee an opinion of counsel to the effect that holders of the notes will not recognize income, gain or loss for United States federal income tax purposes as a result of the Company's exercise of its option and will be subject to federal income tax on the same amounts and in the same manner and at the same times as would have been the case if such action had not been exercised and, in the case of the notes being discharged accompanied by a ruling to that effect received from or published by the United States Internal Revenue Service (the "IRS").

Satisfaction and Discharge

The indenture will be discharged, and will cease to be of further effect as to the notes, when:

- (1) either:
 - (a) all of the notes that have been authenticated, except lost, stolen or destroyed notes that have been replaced or paid and the notes for whose payment money has been deposited in trust and thereafter repaid to the Company, have been delivered to the trustee for cancellation; or
 - (b) all of the notes that have not been delivered to the trustee for cancellation (1) have become due and payable, (2) will become due and payable at their stated maturity within one year or (3) are to be called for redemption within one year under arrangements satisfactory to the trustee for the giving of notice of redemption and, in the case of the provisions described in (1), (2) or (3), as applicable, of this clause (b), the Company has irrevocably deposited or caused to be deposited with the trustee or paying agent as trust funds in trust an amount sufficient to pay and discharge the entire indebtedness on the notes for principal, premium, if any, and interest to the date of such deposit or the date of maturity or redemption, as the case may be; and
- (2) the Company has paid or caused to be paid all other sums payable by it under the indenture with respect to the notes.

In addition, the Company must deliver an officers' certificate and an opinion of counsel to the trustee stating that all conditions precedent relating to satisfaction and discharge of the indenture with respect to the notes have been complied with.

Trustee, Paying Agent, Transfer Agent and Registrar

Wells Fargo Bank, National Association, is the trustee for the notes. In the ordinary course of business, the trustee and affiliates of the trustee have engaged and may in the future engage in commercial banking transactions with the Company and its affiliates.

Elavon Financial Services Limited, UK Branch will act as the paying agent with respect to the notes and Elavon Financial Services Limited will act as the transfer agent and the registrar with respect to the notes.

No Personal Liability of Directors, Officers, Employees and Stockholders

No director, officer, employee, incorporator or stockholder of the Company, and no director, officer, employee, incorporator, member or stockholder of or any subsidiary of the Company, as such, will have any liability for any obligations of the issuer under the notes, or the indenture or for any claim based on, in respect of, or by reason of such obligations or their creation. Each holder of the notes by accepting a note waives and releases all such liability. The waiver and release are part of the consideration for issuance of the notes. Such waiver and release may not be effective to waive liabilities under the U.S. federal securities laws, and it is the view of the SEC that such a waiver is against public policy.

Book-Entry Procedures

Global Clearance and Settlement

The notes will be issued in the form of one or more global notes in fully registered form, without coupons, and will be deposited with, or on behalf of, a common depository, and registered in the name of the nominee of the common depository, for, and in respect of interests held through, Euroclear and Clearstream. Except as described herein, certificates will not be issued in exchange for beneficial interests in the global notes.

Except as set forth below, the global notes may be transferred, in whole and not in part, only to Euroclear or Clearstream or their respective nominees.

Beneficial interests in the global notes will be represented, and transfers of such beneficial interests will be effected, through accounts of financial institutions acting on behalf of beneficial owners as direct or indirect participants in Euroclear or Clearstream. Those beneficial interests will be in denominations of €100,000 and integral multiples of €1,000 in excess thereof. Investors may hold notes directly through Euroclear or Clearstream, if they are participants in such systems, or indirectly through organizations that are participants in such systems.

For so long as the notes are represented by a global note deposited with, and registered in the name of a nominee for, a common depository for Euroclear and/or Clearstream, each person (other than Euroclear or Clearstream) who is for the time being shown in the records of Euroclear or of Clearstream as the holder of a particular nominal amount of the notes (in which regard any certificate or other document issued by Euroclear or Clearstream as to the nominal amount of the notes standing to the account of any person shall be conclusive and binding for all purposes save in the case of manifest error) shall upon their receipt of a certificate or other document be treated by the Company and the trustee as the holder of such nominal amount of the notes and the registered holder of the global note shall be deemed not to be the holder for all purposes other than with respect to the payment of principal or interest on such nominal amount of the notes, for which purpose the registered holder of the relevant global note shall be treated by the Company and the trustee as the holder of such nominal amount of the notes in accordance with and subject to the terms of the global note and the expressions "noteholder" and "holder of notes" and related expressions shall be construed accordingly.

Exchange of Global Notes for Certificated Notes

Subject to certain conditions, the notes represented by the global notes are exchangeable for certificated notes in definitive form of like tenor in minimum denominations of €100,000 principal amount and multiples of €1,000 in excess thereof if:

- (1) the common depository notifies us that it is no longer willing or able to act as a depository for such global notes or ceases to be a clearing agency registered under the Exchange Act and we fail to appoint a successor common depository within 90 days;
- (2) an event of default has occurred and is continuing and the common depository requests the issuance of certificated notes; or
- (3) we determine not to have the notes represented by a global note.

In all cases, certificated notes delivered in exchange for any global note or beneficial interest therein will be registered in the names, and issued in any approved denominations, requested by or on behalf of the common depository (in accordance with its customary procedures).

Payments (including principal, premium and interest) and transfers with respect to notes in certificated form may be executed at the office or agency maintained for such purpose in London (initially the corporate trust office of the paying agent) or, at our option, by check mailed to the holders thereof at the respective addresses set forth in the register of holders of the notes (maintained by the registrar), provided that all payments (including principal, premium and interest) on notes in certificated form, for which the holders thereof have given wire transfer instructions, will be required to be made by wire transfer of immediately available funds to the accounts specified by the holders thereof. No service charge will be made for any registration of transfer, but payment of a sum sufficient to cover any tax or governmental charge payable in connection with such registration may be required.

Governing Law

The indenture and the debt securities are governed by, and construed in accordance with, the laws of the State of New York.

3. 1.000% EURO NOTES DUE 2024

The following description of the Ecolab 1.000% Euro Notes due 2024 is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to the Indenture, dated January 12, 2015, between the Company and Wells Fargo Bank, National Association, and the Fifth Supplemental Indenture, dated December 8, 2016, by and among the Company, Wells Fargo Bank, National Association, Elavon Financial Services DAC, UK Branch, as paying agent, and Elavon Financial Services DAC, as transfer agent and registrar (such Indenture and Fifth Supplemental Indenture referred to, respectively, as the "base indenture" and the "supplemental indenture" and, collectively, as the "indenture" in the description below), each of which are incorporated by reference as an exhibit to the Annual Report on Form 10-K of which this Exhibit 4.20 is a part. We encourage you to read the base indenture and the supplemental indenture for additional information.

General

The notes were issued under an indenture, dated as of January 12, 2015, between us and Wells Fargo Bank, National Association, as trustee (the "base indenture"). Certain terms of the notes are contained in a fifth supplemental indenture (the "supplemental indenture" and, together with the base indenture, the "indenture"), among us, Wells Fargo Bank, National Association, as trustee, and certain other parties.

The notes are our senior unsecured obligations and rank equally in right of payment to our other senior debt from time to time outstanding. The notes are structurally subordinated to all liabilities of our subsidiaries, including trade payables. Since we conduct many of our operations through our subsidiaries, our right to participate in any distribution of the assets of a subsidiary when it winds up its business is subject to the prior claims of the creditors of the subsidiary. This means that a holder of our notes will also be subject to the prior claims of these creditors if a subsidiary liquidates or reorganizes or otherwise winds up its business. Unless we are considered a creditor of the subsidiary, a holder's claims will be recognized behind these creditors.

The indenture does not limit the amount of notes, debentures or other evidences of indebtedness that we may issue under the indenture and provides that notes, debentures or other evidences of indebtedness may be issued from time to time in one or more series. We may from time to time, without giving notice to or seeking the consent of the holders of the notes offered hereby, issue additional debt securities having the same terms (except for the issue date and, in some cases, the public offering price and the first interest payment date) and ranking equally and ratably with the notes offered hereby. Any additional debt securities having such similar terms, together with the notes offered hereby, will constitute a single series of securities under the indenture.

The notes were initially issued in €575,000,000 aggregate principal amount and will mature on January 15, 2024. The notes bear interest at the rate of 1.000% per year from the date of original issuance, or from the most recent interest payment date to which interest has been paid or provided for. Interest on the notes accrued from December 8, 2016. We make interest payments on the notes annually in arrears on January 15 of each year, commencing January 15, 2018. Payment of interest on the notes on any interest payment date is made to the person in whose name such note (or predecessor note) is registered (which shall initially be the common depository) at the close of business on the business day immediately preceding such interest payment date (the record date with respect to the notes). Interest on the notes is computed on the basis of the actual number of days in the period for which interest is being calculated and the actual number of days from and including the last date on which interest was paid on the notes (or from December 8, 2016, if no interest has been paid on the notes) to but excluding the next scheduled interest payment date. This payment convention is referred to as ACTUAL/ACTUAL (ICMA) (as defined in the rulebook of the International Capital Market Association).

If an interest payment date or the maturity date with respect to the notes falls on a day that is not a business day, the payment is made on the next business day as if it were made on the date the payment was due, and no interest will accrue on the amount so payable for the period from and after that interest payment date or the maturity date, as the case may be, to the date the payment is made. Interest payment for the notes includes accrued interest from and including the date of issue or from and including the last date in respect of which interest has been paid, as the case may be, to, but excluding, the interest payment date or the date of maturity, as the case may be.

For purposes of the notes, "business day" means any day, other than a Saturday or Sunday, (1) which is not a day on which banking institutions in The City of New York or London are authorized or required by law, regulation or executive order to close and (2) on which the Trans-European Automated Real-Time Gross Settlement Express Transfer system (the TARGET2 system), or any successor thereto, is open.

The notes were issued only in registered book-entry form, in minimum denominations of €100,000 and integral multiples of €1,000 in excess thereof.

Issuance in Euro

Initial holders were required to pay for the notes in euros, and all payments of principal of, and premium or redemption price, if any, and interest on the notes, is made in euros.

If the euro is unavailable to us due to the imposition of exchange controls or other circumstances beyond our control or the euro is no longer used by the then member states of the European Monetary Union that have adopted the euro as their currency or for the settlement of transactions by public institutions within the international banking community, then all payments in respect of the notes will be made in U.S. dollars until the euro is again available to us or so used. In such circumstances, the amount payable on any date in euros will be converted to U.S. dollars on the basis of the Market Exchange Rate (as defined below) on the second business day before the date that payment is due, or if such Market Exchange Rate is not then available, on the basis of the most recently available Market Exchange Rate on or before the date that payment is due. Any payment in respect of the notes so made in U.S. dollars will not constitute an event of default under the indenture. Neither the trustee nor the Paying Agent will be responsible for obtaining exchange rates, effecting conversions or otherwise handling redenominations. "Market Exchange Rate" means the noon buying rate in The City of New York for cable transfers of euros as certified for customs purposes (or, if not so certified, as otherwise determined) by the Federal Reserve Bank of New York. Investors are subject to foreign exchange risks as to payments of principal and interest that may have important economic and tax consequences to them. See "Risk Factors."

Optional Redemption

We may redeem the notes, at any time prior to the date that is three months prior to their maturity, at any time in whole or from time to time in part, in each case at our option, at a redemption price equal to the greater of:

- (i) 100% of the principal amount of the notes to be redeemed on that redemption date; and
- (ii) the sum of the present values of the remaining scheduled payments of principal and interest on the notes to be redeemed (exclusive of interest accrued to the redemption date), discounted to the redemption date on an annual basis (ACTUAL/ACTUAL (ICMA)) at the applicable Comparable Government Bond Rate plus 20 basis points,

plus, in each case, accrued and unpaid interest, if any, to but excluding the redemption date.

In addition, we may redeem the notes on or after October 15, 2023 (three months prior to their maturity), at any time in whole or from time to time in part, in each case at our option, at a redemption price equal to 100% of the principal amount of the notes to be redeemed, plus accrued and unpaid interest, if any, to but excluding the redemption date.

Notwithstanding the foregoing, installments of interest on notes that are due and payable on interest payment dates falling on or prior to a redemption date will be payable on the interest payment date to the registered holders as of the close of business on the relevant record date according to the notes and the indenture.

"*Comparable Government Bond*" means, in relation to any Comparable Government Bond Rate calculation, at the discretion of an Independent Investment Banker, a German government bond whose maturity is closest to the maturity of the notes to be redeemed, or if the Independent Investment Banker in its discretion determines that such similar bond is not in issue, such other German government bond as such Independent Investment Banker may, with the advice of the Reference Bond Dealers, determine to be appropriate for determining the Comparable Government Bond Rate.

"*Comparable Government Bond Rate*" means the price, expressed as a percentage (rounded to three decimal places, with 0.0005 being rounded upwards), at which the gross redemption yield on the notes to be redeemed, if they were to be purchased at such price on the third business day prior to the date fixed for redemption, would be equal to the gross redemption yield on such business day of the Comparable Government Bond on the basis of the middle market price of the Comparable Government Bond prevailing at 11:00 a.m. (London time) on such business day as determined by an Independent Investment Banker.

"*Independent Investment Banker*" means one of the Reference Bond Dealers that we appoint to act as the Independent Investment Banker from time to time.

"*Reference Bond Dealer*" means each of J.P. Morgan Securities plc, Merrill Lynch International and MUFG Securities EMEA plc and their successors, and any other firm that is a broker of, and/or market maker in German government bonds (each a "Primary Bond Dealer") which we specify from time to time; provided, however, that if any of them ceases to be a Primary Bond Dealer, we will substitute another Primary Bond Dealer.

Notice of any redemption will be delivered at least 30 days but not more than 60 days before the redemption date to each registered holder of the notes to be redeemed (with a copy to the trustee and the paying agent) by us; provided that notice of redemption may be delivered more than 60 days prior to a redemption date if the notice is issued in connection with a defeasance of the notes or a satisfaction and discharge of the notes. Once notice of redemption is delivered, the notes called for redemption will become due and payable on the redemption date and at the applicable redemption price, plus accrued and unpaid interest to, but excluding, the redemption date.

Unless we default in payment of the redemption price, on and after the redemption date, interest will cease to accrue on the notes or portions thereof called for redemption. On or before the redemption date, we will deposit with a paying agent (or the trustee) money sufficient to pay the redemption price of and accrued interest on the notes to be redeemed on that date. If less than all of the notes are to be redeemed, the notes to be redeemed will be selected by the registrar in accordance with applicable procedures of Clearstream or Euroclear.

Payment of Additional Amounts

All payments in respect of the notes will be made by or on behalf of us without withholding or deduction for, or on account of, any present or future taxes, duties, assessments or governmental charges of whatever nature, imposed or levied by the United States or any taxing authority thereof or therein, unless such withholding or deduction is required by law. If such withholding or deduction is required by law, we or a paying agent will pay to a holder who is not a United States person such additional amounts on the notes as are necessary in order that the net payment by us or a paying agent of the principal of, and premium or redemption price, if any, and interest on, the notes to such holder, after such withholding or deduction, will not be less than the amount provided in the notes to be then due and payable; provided, however, that the foregoing obligation to pay additional amounts will not apply:

- (1) to any tax, assessment or other governmental charge that would not have been imposed but for the holder, or a fiduciary, settlor, beneficiary, member or stockholder of the holder if the holder is an estate, trust, partnership or corporation, or a person holding a power over an estate or trust administered by a fiduciary holder, being considered as:
 - (a) being or having been engaged in a trade or business in the United States or having or having had a permanent establishment in the United States or having or having had a qualified business unit which has the United States dollar as its functional currency;
 - (b) having a current or former connection with the United States (other than a connection arising solely as a result of the ownership of the notes, the receipt of any payment or the enforcement of any rights thereunder) or being considered as having such relationship, including being or having been a citizen or resident of the United States;
 - (c) being or having been a personal holding company, a passive foreign investment company or a controlled foreign corporation with respect to the United States or a foreign personal holding company that has accumulated earnings to avoid United States federal income tax;
 - (d) being or having been an owner of a 10% or greater interest in the capital or profits of the Company within the meaning of Section 871(h)(3) of the U.S. Internal Revenue Code of 1986, as amended (the "Code") or any successor provision; or
 - (e) being a bank receiving payments on an extension of credit made pursuant to a loan agreement entered into in the ordinary course of its trade or business;
- (1) to any holder that is not the sole beneficial owner of the notes, or a portion of the notes, or that is a fiduciary, partnership or limited liability company, but only to the extent that a beneficiary or settlor with respect to the fiduciary, a beneficial owner or member of the partnership or limited liability company would not have been entitled to the payment of an additional amount had the beneficiary, settlor, beneficial owner or member received directly its beneficial or distributive share of the payment;
- (2) to any tax, assessment or other governmental charge that would not have been imposed but for the failure of the holder or any other person to comply with certification, identification or information reporting requirements concerning the nationality, residence, identity or connection with the United States of the holder or beneficial owner of the notes, if compliance is required by statute, by regulation of the United States or any taxing authority therein or by an applicable income tax treaty to which the United States is a party as a precondition to exemption from such tax, assessment or other governmental charge;
- (3) to any tax, assessment or other governmental charge that is imposed otherwise than by withholding by us or a paying agent from the payment;
- (4) to any tax, assessment or other governmental charge that would not have been imposed but for a change in law, regulation, or administrative or judicial interpretation that becomes effective more than 15 days after the payment becomes due or is duly provided for, whichever occurs later;
- (5) to any estate, inheritance, gift, sales, excise, transfer, wealth, capital gains or personal property tax or similar tax, assessment or other governmental charge;
- (6) to any withholding or deduction that is imposed on a payment to an individual and that is required to be made pursuant to European Council Directive 2003/48/EC on the taxation of savings income or any other Directive amending, supplementing or replacing such Directive, or any law implementing or complying with, or introduced in order to conform to, such Directive or Directives;
- (7) to any tax, assessment or other governmental charge required to be withheld by any paying agent from any payment of principal of or interest on any note, if such payment can be made without such withholding by at least one other paying agent;
- (8) to any tax, assessment or other governmental charge that would not have been imposed but for the presentation by the holder of any note, where presentation is required, for payment on a date more than 30 days after the date on which payment became due and payable or the date on which payment thereof is duly provided for, whichever occurs later;
- (9) to any withholding or deduction that is imposed on a payment pursuant to Sections 1471 through 1474 of the Code and related Treasury regulations and pronouncements (the "Foreign Account Tax Compliance Act") or any successor provisions and any regulations or official law, agreement or interpretations thereof in any jurisdiction implementing an intergovernmental approach thereto; or
- (10) in the case of any combination of items (1), (2), (3), (4), (5), (6), (7), (8), (9) and (10).

The notes are subject in all cases to any tax, fiscal or other law or regulation or administrative or judicial interpretation applicable to the notes. Except as specifically provided under this heading "—Payment of Additional Amounts," we will not be required to make any payment for any tax, duty, assessment or governmental charge of whatever nature imposed by any government or a political subdivision or taxing authority of or in any government or political subdivision.

As used under this heading “—Payment of Additional Amounts” and under the heading “—Redemption for Tax Reasons,” the term “United States” means the United States of America (including the States and the District of Columbia), its territories and its possessions and other areas subject to its jurisdiction, and the term “United States person” means any individual who is a citizen or resident of the United States for U.S. federal income tax purposes, a corporation, partnership or other entity created or organized in or under the laws of the United States, any state of the United States or the District of Columbia, including an entity treated as a corporation for United States income tax purposes, or any estate or trust the income of which is subject to United States federal income taxation regardless of its source.

Redemption for Tax Reasons

If, as a result of any change in, or amendment to, the laws (or any regulations or rulings promulgated under the laws) of the United States (or any taxing authority thereof or therein), or any change in, or amendments to, an official position regarding the application or interpretation of such laws, regulations or rulings, which change or amendment is announced or becomes effective on or after December 1, 2016, we become or, based upon a written opinion of independent counsel of recognized standing selected by us, will become obligated to pay additional amounts as described herein under the heading “—Payment of Additional Amounts” with respect to the notes, then we may at our option, having given not less than 30 nor more than 60 days prior notice to holders, redeem, in whole, but not in part, the notes at a redemption price equal to 100% of the principal amount of the notes being redeemed, together with accrued and unpaid interest on such notes to, but excluding, the redemption date.

Sinking Fund

The notes are not entitled to any sinking fund.

Offer to Repurchase upon a Change of Control Repurchase Event

If a Change of Control Repurchase Event (as defined below) occurs, unless we have exercised our right to redeem the notes in whole as described above, we will make an offer to each holder to repurchase all or any part (equal to €100,000 and integral multiples of €1,000 in excess thereof) of that holder's notes at a repurchase price in cash equal to 101% of the aggregate principal amount of notes repurchased plus any accrued and unpaid interest on the notes repurchased to the date of repurchase.

Within 30 days following any Change of Control Repurchase Event or, at our option, prior to any Change of Control (as defined below), but after the public announcement of the transaction or transactions that constitutes or may constitute a Change of Control, we will mail a notice to each holder, with a copy to the trustee and the paying agent, describing the transaction or transactions that constitute or may constitute the Change of Control Repurchase Event and offering to repurchase notes on the payment date specified in the notice, which date will be no earlier than 30 days and no later than 60 days from the date such notice is mailed. The notice shall, if mailed prior to the date of consummation of the Change of Control, state that the offer to purchase is conditioned on the Change of Control Repurchase Event occurring on or prior to the payment date specified in the notice.

We will comply with the requirements of Rule 14e-1 under the Exchange Act and any other securities laws and regulations thereunder, to the extent those laws and regulations are applicable in connection with the repurchase of the notes as a result of a Change of Control Repurchase Event. To the extent that the provisions of any securities laws or regulations conflict with the Change of Control Repurchase Event provisions of the notes, we will comply with the applicable securities laws and regulations and will not be deemed to have breached our obligations under the Change of Control Repurchase Event provisions of the notes by virtue of such conflict.

On the Change of Control Repurchase Event payment date, we will, to the extent lawful:

- accept for payment all notes or portions of notes properly tendered pursuant to our offer;
- deposit with the paying agent an amount equal to the aggregate purchase price in respect of all notes or portions of notes properly tendered; and
- deliver or cause to be delivered to the trustee the notes properly accepted, together with an officers' certificate stating the aggregate principal amount of notes being repurchased by us.

The paying agent will promptly deliver to each holder of notes properly tendered the purchase price for the notes, and the trustee will promptly authenticate and mail (or cause to be transferred by book-entry) to each holder a new note equal in principal amount to any unpurchased portion of any notes surrendered; provided, that each new note will be in a principal amount of €100,000 or integral multiples of €1,000 above that amount.

We will not be required to make an offer to repurchase the notes upon a Change of Control Repurchase Event if a third party makes such an offer in the manner, at the times and otherwise in compliance with the requirements for an offer made by us and such third party purchases all notes properly tendered and not withdrawn under its offer.

Definitions

“Below Investment Grade Rating Event” means the rating on the notes is lowered by each of the Rating Agencies and the notes are rated below Investment Grade by each of the Rating Agencies on any day within the 60-day period (which 60-day period will be extended so long as the rating of the notes is under publicly announced consideration for a possible downgrade by any of the Rating Agencies) after the earlier of (1) the occurrence of a Change of Control and (2) public notice of the occurrence of a Change of Control or our intention to effect a Change of Control; provided that a Below Investment Grade Rating Event otherwise arising by virtue of a particular reduction in rating will not be deemed to have occurred in respect of a particular Change of Control (and thus will not be deemed a Below Investment Grade Rating Event for purposes of the definition of Change of Control Repurchase Event) if the Rating Agencies making the reduction in rating to which this definition would otherwise apply do not announce or publicly confirm or inform the trustee in writing at its request that the reduction was the result, in whole or in part, of any event or circumstance comprised of or arising as a result of, or in respect of, the applicable Change of Control (whether or not the applicable Change of Control has occurred at the time of the Below Investment Grade Rating Event).

"Change of Control" means the occurrence of any of the following:

- (1) the direct or indirect sale, transfer, conveyance or other disposition (other than by way of merger or consolidation), in one or a series of related transactions, of all or substantially all of our assets and those of our subsidiaries, taken as a whole, to any "person" (as that term is used in Section 13(d)(3) of the Exchange Act), other than us or one of our subsidiaries;
- (2) the first day on which a majority of the members of our Board of Directors are not Continuing Directors; or
- (3) the consummation of any transaction (including, without limitation, any merger or consolidation) the result of which is that any "person" (as that term is used in Section 13(d)(3) of the Exchange Act), other than us or one or more of our wholly-owned subsidiaries, becomes the beneficial owner, directly or indirectly, of more than 50% of the then outstanding number of shares of our Voting Stock.

Notwithstanding the foregoing, a transaction will not be deemed to involve a Change of Control if (1) we become a direct or indirect wholly-owned subsidiary of a holding company and (2)(A) the direct or indirect holders of the voting stock of such holding company immediately following that transaction are substantially the same as the holders of our voting stock immediately prior to that transaction or (B) immediately following that transaction no person (other than a holding company satisfying the requirements of this sentence) is the beneficial owner, directly or indirectly of more than 50% of the voting stock of such holding company. The term "person," as used in this definition, has the meaning given thereto in Section 13(d)(3) of the Exchange Act.

"Change of Control Repurchase Event" means the occurrence of both a Change of Control and a Below Investment Grade Rating Event.

"Continuing Director" means, as of any date of determination, any member of our Board of Directors who (1) was a member of our Board of Directors on the date of the issuance of the notes; or (2) was nominated for election, elected or appointed to our Board of Directors with the approval of a majority of the Continuing Directors who were members of our Board of Directors at the time of such nomination, election or appointment (either by a specific vote or by approval of our proxy statement in which such member was named as a nominee for election as a director).

"Investment Grade" means a rating of Baa3 or better by Moody's (or its equivalent under any successor rating categories of Moody's) and a rating of BBB- or better by S&P (or its equivalent under any successor rating categories of S&P) or the equivalent investment grade credit rating from any additional Rating Agency or Rating Agencies selected by us.

"Moody's" means Moody's Investors Service Inc. and its successors.

"Rating Agency" means (1) each of Moody's and S&P; and (2) if either Moody's or S&P ceases to rate the notes or fails to make a rating of the notes publicly available for reasons outside of our control, a "nationally recognized statistical rating organization" as defined in Section 3(a)(62) of the Exchange Act, selected by us as a replacement agency for Moody's or S&P, or both, as the case may be.

"S&P" means S&P Global Ratings, a division of S&P Global Inc., and its successors.

"Voting Stock" of any specified person as of any date means the capital stock of such person that is at the time entitled to vote generally in the election of the board of directors of such person.

Certain Covenants of the Company

You can find the definitions of certain terms used in this section under "—Certain Definitions."

Restrictions on Liens.

The Company will not, and will not permit any Restricted Subsidiary to, issue, assume or guarantee any indebtedness for money borrowed (herein referred to as "Debt") if such Debt is secured by any mortgage, security interest, pledge, lien or other encumbrance (herein referred to as a "mortgage") upon any Operating Property (as defined under "—Certain Definitions" below) of the Company or any Restricted Subsidiary or any shares of stock or Debt of any Restricted Subsidiary, whether owned at the date of the issuance of the notes or thereafter acquired, without effectively securing the notes equally and ratably with such Debt for at least the period such other Debt is so secured unless, after giving effect thereto, the aggregate amount of all Debt so secured (not including Debt permitted in clauses (1) through (7) in the following sentence), together with all Attributable Debt (as defined under "—Certain Definitions" below) in respect of Sale and Leaseback Transactions involving Operating Properties pursuant to clause (2) under "—Restrictions on Sale and Leaseback Transactions" in existence at such time would not exceed 15% of Consolidated Net Tangible Assets (as defined under "—Certain Definitions" below).

The foregoing restriction does not apply to, and therefore will be excluded in computing secured Debt for the purpose of such restriction, Debt secured by:

- (1) mortgages on Operating Property, shares of stock or Debt of any entity existing at the time such entity becomes a Restricted Subsidiary, provided that such mortgages are not incurred in anticipation of such entity's becoming a Restricted Subsidiary;
- (2) mortgages on Operating Property, shares of stock or Debt existing at the time of acquisition thereof by the Company or a Restricted Subsidiary or mortgages thereon to secure the payment of all or any part of the purchase price thereof, or mortgages on Operating Property, shares of stock or Debt to secure any Debt incurred prior to, at the time of, or within 180 days after, the latest of the acquisition thereof or, in the case of Operating Property, the completion of construction, the completion of improvements or the commencement of substantial commercial operation of such Operating Property for the purpose of financing all or any part of the purchase price thereof, such construction or the making of such improvements
- (3) mortgages to secure Debt owing to the Company or to a Restricted Subsidiary;
- (4) mortgages on Operating Property, shares of stock or Debt existing at the date of the initial issuance of the notes;

- (5) mortgages on Operating Property, shares of stock or Debt of a person existing at the time such person is merged into or consolidated with the Company or a Restricted Subsidiary or at the time of a sale, lease or other disposition of the properties of a person as an entirety or substantially as an entirety to the Company or a Restricted Subsidiary, provided that such mortgage was not incurred in anticipation of such merger or consolidation or sale, lease or other disposition;
- (6) mortgages on Operating Property, shares of stock or Debt in favor of the United States or any state, territory or possession thereof (or the District of Columbia), or any department, agency, instrumentality or political subdivision of the United States or any state, territory or possession thereof (or the District of Columbia), to secure partial, progress, advance or other payments pursuant to any contract or statute or to secure any Debt incurred for the purpose of financing all or any part of the purchase price or the cost of constructing or improving the Operating Property subject to such mortgages; or
- (7) extensions, renewals or replacements, in whole or in part, of any mortgage referred to in the foregoing clauses (1) through (6), provided, however, that the principal amount of Debt secured thereby will not exceed the principal amount of Debt so secured at the time of such extension, renewal or replacement.

Restrictions on Sale and Leaseback Transactions.

Sale and Leaseback Transactions by the Company or any Restricted Subsidiary with a third party of any Operating Property are prohibited (except for temporary leases for a term, including renewals, of not more than 60 months and except for leases between the Company and a Restricted Subsidiary or between Restricted Subsidiaries) unless the net proceeds of such Sale and Leaseback Transactions are at least equal to the fair market value (as determined in good faith by the Board of Directors of the Company) of the Operating Property to be leased and either:

- (1) the Company or such Restricted Subsidiary would (at the time of entering into such arrangement) be entitled, as described in clauses (1) through (7) of the second paragraph under the caption “—Restrictions on Liens” herein, without equally and ratably securing the notes, to issue, assume or guarantee Debt secured by a mortgage on such Operating Property;
- (2) the Attributable Debt of the Company and its Restricted Subsidiaries in respect of such Sale and Leaseback Transactions (other than such Sale and Leaseback Transactions as are referred to in clause (1) or (3) of this paragraph), plus the aggregate principal amount of Debt secured by mortgages on Operating Properties then outstanding (excluding any such Debt secured by mortgages described in clauses (1) through (7) of the second paragraph under the caption “—Restrictions on Liens” herein) which do not equally and ratably secure the notes, would not exceed 15% of Consolidated Net Tangible Assets; or
- (3) the Company, within 180 days after the sale or transfer, applies or causes a Restricted Subsidiary to apply an amount equal to the greater of the net proceeds of such sale or transfer or fair market value of the Operating Property (as determined in good faith by the Board of Directors of the Company) so sold and leased back at the time of entering into such Sale and Leaseback Transaction to
 - (a) retire (other than any mandatory retirement, mandatory repayment or sinking fund payment or by payment at maturity) notes or other Debt of the Company or a Restricted Subsidiary (other than Debt subordinated to the notes) having a Stated Maturity (as defined in the indenture) more than 12 months from the date of such application or which is extendible at the option of the obligor thereon to a date more than 12 months from the date of such application or
 - (b) purchase, construct or develop one or more Operating Properties (other than that involved in such Sale and Leaseback Transaction);

provided that the amount to be so applied pursuant to clause (3) will be reduced by the principal amount of notes delivered within 180 days after such sale or transfer to the Trustee for retirement and cancellation.

Restricted and Unrestricted Subsidiaries

The restrictive provisions described above under “—Certain Covenants of the Company” are applicable to the Company and its Restricted Subsidiaries and do not apply to Unrestricted Subsidiaries. The assets and liabilities of Unrestricted Subsidiaries are not consolidated with those of the Company and its Restricted Subsidiaries in calculating Consolidated Net Tangible Assets under the indenture.

“Unrestricted Subsidiaries” are defined as (1) any Subsidiary substantially all of whose physical properties are located, or substantially all of whose business is carried on, outside the United States and Canada, (2) any finance Subsidiary and (3) any Subsidiary of an Unrestricted Subsidiary. In addition, the Board of Directors may designate any other Subsidiary of the Company (including any newly acquired or newly formed Subsidiary) to be an Unrestricted Subsidiary unless such Subsidiary owns any capital stock of, or owns or holds any mortgage on any Operating Property of, the Company or any Restricted Subsidiary of the Company; provided that the Subsidiary to be so designated has total assets at the time of such designation of \$5 million or less. “Restricted Subsidiaries” are all Subsidiaries other than Unrestricted Subsidiaries.

The term “Subsidiary” means, among other things, any corporation or other entity of which the Company directly or indirectly owns or controls more than 50% of the total voting power of the shares of capital stock (or equivalent) entitled to vote in the election of directors (or equivalent).

Neither the Company nor any Restricted Subsidiary may transfer an Operating Property or shares of stock or Debt of a Restricted Subsidiary to an Unrestricted Subsidiary.

An Unrestricted Subsidiary may not be designated a Restricted Subsidiary unless, after giving effect thereto, the aggregate amount of all Debt of the Company and its Restricted Subsidiaries secured by mortgages which would otherwise be subject to the restrictions described under “—Certain Covenants of the Company—Restrictions on Liens” and the Attributable Debt in respect of all Sale and Leaseback Transactions pursuant to clause (2) under “—Certain Covenants of the Company—Restrictions on Sale and Leaseback Transactions” in existence at such time does not at the time exceed 15% of Consolidated Net Tangible Assets.

Certain Definitions

“Attributable Debt” in respect of a Sale and Leaseback Transaction means, as of any particular time, the present value (discounted at the rate of interest implicit in the terms of the lease involved in the Sale and Leaseback Transaction, as determined in good faith by the Company) of the obligation of the lessee thereunder for net rental payments (excluding, however, any amounts required to be paid by such lessee, whether or not designated as rent or additional rent, on account of maintenance and repairs, services, insurance, taxes, assessments, water rates and similar charges or any amounts required to be paid by such lessee thereunder contingent upon monetary inflation or the amount of sales, maintenance and repairs, insurance, taxes, assessments, water rates or similar charges) during the remaining term of such lease (including any period for which such lease has been extended or may, at the option of the lessor, be extended).

“Consolidated Net Tangible Assets” means the aggregate amount of assets (less applicable reserves and other properly deductible items) of the Company and its Restricted Subsidiaries after deducting therefrom (a) all goodwill, tradenames, trademarks, patents, unamortized debt discount and expense and other like intangibles and (b) all current liabilities (excluding any current liabilities for money borrowed having a maturity of less than 12 months but by its terms being renewable or extendible beyond 12 months from such date at the option of the borrower), all as reflected in the Company’s latest audited consolidated balance sheet contained in the Company’s most recent annual report to its stockholders prior to the time as of which “Consolidated Net Tangible Assets” will be determined.

“Operating Property” means any manufacturing or processing plant, warehouse or distribution center, together with the land upon which it is situated located within the United States or in Canada and owned and operated now or hereafter by the Company or any Restricted Subsidiary and having a net book value on the date as of which the determination is being made of more than 1.0% of Consolidated Net Tangible Assets other than property which, in the opinion of the Board of Directors of the Company, is not of material importance to the total business conducted by the Company and its Restricted Subsidiaries taken as a whole.

“United States” means the United States of America (including the States and the District of Columbia), its territories and its possessions and other areas subject to its jurisdiction.

Merger, Consolidation and Sale of Assets

The Company will not: (a) consolidate with or merge into another corporation or entity or (b) sell, convey, transfer or lease all or substantially all its assets to another corporation or entity, unless:

- (1) the corporation or entity formed by such consolidation or into which the Company is merged or to which such sale, conveyance, transfer or lease is made is a domestic corporation or entity and expressly assumes, pursuant to a supplemental indenture, all the obligations of the Company under the indenture and the notes; and
- (2) immediately after the completion of the transaction, no default or event of default has occurred and is continuing.

Clause (2) above will not apply to (A) any sale, conveyance, transfer or lease between the Company and one or more of its subsidiaries, (B) any merger of the Company into one of its subsidiaries or (C) any merger of the Company into one of its affiliates for the purpose of reincorporating or reorganizing.

The surviving or successor entity formed by any such consolidation or into which the Company is so merged or to which such sale, conveyance, transfer or lease is made, will succeed to, and be substituted for, and may exercise every right and power of, the Company under the indenture with the same effect as if such successor entity had been named as the Company under the indenture, and after any such transaction, other than a lease, the Company will be relieved of and discharged from all obligations and covenants under the indenture and the notes.

Events of Default

The indenture defines an event of default with respect to the notes as being any one of the following events:

- (1) default for 30 days in any payment of interest on the notes when due;
- (2) default in any payment of principal of the notes when due either at maturity, upon redemption, by declaration or otherwise;
- (3) default for 60 days after appropriate notice in performance of any other covenant or agreement in the indenture applicable to the notes; or
- (4) certain events of bankruptcy, insolvency or reorganization.

If an event of default (other than an event of default described in clause (4) above) occurs and is continuing, the trustee or the holders of 25% or more in principal amount of the outstanding notes may declare the principal of and accrued but unpaid interest on such notes to be immediately due and payable. If an event of default described in clause (4) above occurs and is continuing, then the principal amount of and all accrued but unpaid interest on all of the notes shall automatically, and without any declaration or any other action on the part of the trustee or any holder, become due and payable immediately.

Any event of default may be waived by the holders of a majority in principal amount of the outstanding notes, except a failure to pay principal of or interest on the notes.

The indenture requires the Company to file annually with the trustee an officer's certificate as to the company's compliance with all conditions and covenants under the indenture. The indenture provides that the trustee will, within 90 days after the occurrence of a default in respect of the notes known by it, transmit by mail to all holders of the notes notice of any default known to the trustee, unless such default has been cured or waived; provided, that the trustee will be protected in withholding notice to the holders of the notes of any default (except in payment of principal or interest or any sinking fund installment) if responsible officers of the trustee in good faith determine it is in the interest of the holders of the notes to do so.

If an event of default occurs and is continuing, the indenture provides that the trustee will be under no obligation to exercise any of its rights or powers under the indenture at the request or direction of the holders of the notes unless such holders have offered to the trustee security or indemnity satisfactory to it. Subject to such provisions for indemnification and certain other rights of the trustee, the indenture provides that the holders of a majority in principal amount of the outstanding notes may direct the time, method and place of conducting any proceeding for any remedy available to the trustee or exercising any trust or power conferred on the trustee with respect to the notes. However, the indenture provides that the trustee need not take any action which would be unduly prejudicial to the holders not joining such direction.

No holder of any note will have any right to institute any proceeding with respect to the indenture or for any remedy thereunder unless (1) such holder has previously given to the trustee written notice of a continuing event of default, (2) the holders of at least 25% in principal amount of the outstanding notes have made a written request, and offered to the trustee security and indemnity satisfactory to it, to institute such proceeding as trustee, (3) the trustee has not received from the holders of a majority in principal amount of the outstanding notes a direction inconsistent with such request within 60 days of such notice, request and offer of indemnity and (4) the trustee has failed to institute such proceeding within that 60-day period. However, the holder of any note will have an absolute right to receive payment of the principal of and interest on such note on or after the due dates expressed in such note and to institute suit for the enforcement of any such payment.

Modification and Waiver

The indenture provides that, with the consent of the holders of a majority in aggregate principal amount of the outstanding notes, the Company and the trustee may enter into an indenture or supplemental indentures for the purpose of modifying or changing the indenture or the rights of the holders of the notes; provided, however, that no such supplemental indenture may, without the consent of the holder of each outstanding note, (1) extend the stated maturity of the principal of, or any installment of interest on, any note, (2) reduce the principal amount of or the interest on or any premium payable upon redemption of any note, (3) change the place of payment where, or the currency in which the principal of and premium, if any, or interest on such note is denominated or payable, (4) alter the provisions with respect to the redemption or repurchase of such note, (5) reduce the amount of the principal of an original issue discount security that would be due and payable upon a declaration of acceleration of maturity, (6) impair the right to institute suit for the enforcement of any payment on or after the stated maturity thereof (or, in the case of redemption, on or after the redemption date), (7) reduce the percentage in principal amount of the outstanding notes that is required for a supplemental indenture or waiver or (8) waive an event of default in the payment of principal of, or interest or premium, if any, on any note.

The holders of at least a majority of the principal amount of the outstanding notes may on behalf of the holders of all the notes waive compliance by the Company with certain restrictive provisions of the indenture.

The indenture also permits the Company and the trustee to amend the indenture in certain circumstances without the consent of the holders of the notes to evidence the merger of the Company or the replacement of the trustee and for certain other purposes.

Legal Defeasance and Covenant Defeasance

The indenture provides that, at the Company's option, either (a) the Company will be deemed to have been discharged from its obligations with respect to the notes on the first day after the applicable conditions set forth below have been satisfied or (b) the Company will be deemed to have effected covenant defeasance with respect to the notes at any time after the applicable conditions set forth below have been satisfied:

- (1) the Company has deposited or caused to be deposited irrevocably with the trustee as trust funds in trust, specifically pledged as security for, and dedicated solely to, the benefit of the holders of the notes (i) money in an amount, or (ii) U.S. government obligations that through the payment of interest and principal in respect thereof in accordance with their terms will provide, not later than one day before the due date of any payment, money in an amount, or (iii) a combination of (i) and (ii), sufficient to pay and discharge each installment of principal of and premium, if any, and interest on, the outstanding notes on the dates such installments of interest or principal and premium are due, accompanied, except in the event of clause (i) of this paragraph, by a report as to the sufficiency of the amount deposited from an independent certified accountant or other financial professional of national standing;
- (2) no default with respect to the notes has occurred and is continuing on the date of such deposit; and
- (3) the Company has delivered to the trustee an opinion of counsel to the effect that holders of the notes will not recognize income, gain or loss for United States federal income tax purposes as a result of the Company's exercise of its option and will be subject to federal income tax on the same amounts and in the same manner and at the same times as would have been the case if such action had not been exercised and, in the case of the notes being discharged accompanied by a ruling to that effect received from or published by the United States Internal Revenue Service (the "IRS").

Satisfaction and Discharge

The indenture will be discharged, and will cease to be of further effect as to the notes, when:

- (1) either:
 - (a) all of the notes that have been authenticated, except lost, stolen or destroyed notes that have been replaced or paid and the notes for whose payment money has been deposited in trust and thereafter repaid to the Company, have been delivered to the trustee for cancellation; or
 - (b) all of the notes that have not been delivered to the trustee for cancellation (1) have become due and payable, (2) will become due and payable at their stated maturity within one year or (3) are to be called for redemption within one year under arrangements satisfactory to the trustee for the giving of notice of redemption and, in the case of the provisions described in (1), (2) or (3), as applicable, of this clause (b), the Company has irrevocably deposited or caused to be deposited with the trustee or paying agent as trust funds in trust an amount sufficient to pay and discharge the entire indebtedness on the notes for principal, premium, if any, and interest to the date of such deposit or the date of maturity or redemption, as the case may be; and
- (2) the Company has paid or caused to be paid all other sums payable by it under the indenture with respect to the notes.

In addition, the Company must deliver an officers' certificate and an opinion of counsel to the trustee stating that all conditions precedent relating to satisfaction and discharge of the indenture with respect to the notes have been complied with.

Trustee, Paying Agent, Transfer Agent and Registrar

Wells Fargo Bank, National Association, is the trustee for the notes. In the ordinary course of business, the trustee and affiliates of the trustee have engaged and may in the future engage in commercial banking transactions with the Company and its affiliates.

Elavon Financial Services DAC, UK Branch will act as the paying agent with respect to the notes and Elavon Financial Services DAC will act as the transfer agent and the registrar with respect to the notes.

No Personal Liability of Directors, Officers, Employees and Stockholders

No director, officer, employee, incorporator or stockholder of the Company, and no director, officer, employee, incorporator, member or stockholder of or any subsidiary of the Company, as such, will have any liability for any obligations of the issuer under the notes, or the indenture or for any claim based on, in respect of, or by reason of such obligations or their creation. Each holder of the notes by accepting a note waives and releases all such liability. The waiver and release are part of the consideration for issuance of the notes. Such waiver and release may not be effective to waive liabilities under the U.S. federal securities laws, and it is the view of the SEC that such a waiver is against public policy.

Book-Entry Procedures

Global Clearance and Settlement

The notes will be issued in the form of one or more global notes in fully registered form, without coupons, and will be deposited with, or on behalf of, a common depository, and registered in the name of the nominee of the common depository, for, and in respect of interests held through, Euroclear and Clearstream. Except as described herein, certificates will not be issued in exchange for beneficial interests in the global notes.

Except as set forth below, the global notes may be transferred, in whole and not in part, only to Euroclear or Clearstream or their respective nominees.

Beneficial interests in the global notes will be represented, and transfers of such beneficial interests will be effected, through accounts of financial institutions acting on behalf of beneficial owners as direct or indirect participants in Euroclear or Clearstream. Those beneficial interests will be in denominations of €100,000 and integral multiples of €1,000 in excess thereof. Investors may hold notes directly through Euroclear or Clearstream, if they are participants in such systems, or indirectly through organizations that are participants in such systems.

For so long as the notes are represented by a global note deposited with, and registered in the name of a nominee for, a common depository for Euroclear and/or Clearstream, each person (other than Euroclear or Clearstream) who is for the time being shown in the records of Euroclear or of Clearstream as the holder of a particular nominal amount of the notes (in which regard any certificate or other document issued by Euroclear or Clearstream as to the nominal amount of the notes standing to the account of any person shall be conclusive and binding for all purposes save in the case of manifest error) shall upon their receipt of a certificate or other document be treated by the Company and the trustee as the holder of such nominal amount of the notes and the registered holder of the global note shall be deemed not to be the holder for all purposes other than with respect to the payment of principal or interest on such nominal amount of the notes, for which purpose the registered holder of the relevant global note shall be treated by the Company and the trustee as the holder of such nominal amount of the notes in accordance with and subject to the terms of the global note and the expressions "noteholder" and "holder of notes" and related expressions shall be construed accordingly.

Exchange of Global Notes for Certificated Notes

Subject to certain conditions, the notes represented by the global notes are exchangeable for certificated notes in definitive form of like tenor in minimum denominations of €100,000 principal amount and multiples of €1,000 in excess thereof if:

- (1) the common depositary notifies us that it is no longer willing or able to act as a depositary for such global notes or ceases to be a clearing agency registered under the Exchange Act and we fail to appoint a successor common depositary within 90 days;
- (2) an event of default has occurred and is continuing and the common depositary requests the issuance of certificated notes; or
- (3) we determine not to have the notes represented by a global note.

In all cases, certificated notes delivered in exchange for any global note or beneficial interest therein will be registered in the names, and issued in any approved denominations, requested by or on behalf of the common depositary (in accordance with its customary procedures).

Payments (including principal, premium and interest) and transfers with respect to notes in certificated form may be executed at the office or agency maintained for such purpose in London (initially the corporate trust office of the paying agent) or, at our option, by check mailed to the holders thereof at the respective addresses set forth in the register of holders of the notes (maintained by the registrar), provided that all payments (including principal, premium and interest) on notes in certificated form, for which the holders thereof have given wire transfer instructions, will be required to be made by wire transfer of immediately available funds to the accounts specified by the holders thereof. No service charge will be made for any registration of transfer, but payment of a sum sufficient to cover any tax or governmental charge payable in connection with such registration may be required.

Governing Law

The indenture and the debt securities are governed by, and construed in accordance with, the laws of the State of New York.

**PERFORMANCE-BASED
RESTRICTED STOCK UNIT AWARD AGREEMENT**

THIS AGREEMENT is entered into and effective as of [●] (the “Date of Grant”), by and between Ecolab Inc. (the “Company”) and [●] (the “Grantee”).

A. The Company has adopted the Ecolab Inc. 2010 Stock Incentive Plan, as amended and restated effective May 2, 2013 (the “Plan”), authorizing the Board of Directors of the Company, or a committee as provided for in the Plan (the Board or such a committee to be referred to as the “Committee”), to grant restricted Stock Unit Awards to certain employees of the Company and its Subsidiaries.

B. The Company desires to give the Grantee an incentive to advance the interests of the Company by granting to the Grantee an award of restricted stock units pursuant to the Plan.

Accordingly, the parties agree as follows:

ARTICLE 1. GRANT OF AWARD.

The Company hereby grants to the Grantee a performance-based restricted Stock Unit Award (the “Award”) consisting of [●] units (the “Award Units”), each of which is a bookkeeping entry representing the right to receive one share of the Company’s common stock, par value \$1.00 per share (the “Common Stock”). The Award and Award Units are subject to the terms, conditions, restrictions and risk of forfeiture set forth in this Agreement and in the Plan.

ARTICLE 2. VESTING OF AWARD UNITS.

2.1 Vesting Date and Conditions. Subject to Article 5 below, some or all of the Award Units will vest and become non-forfeitable (“Vested”) on December 31, 2022 (the “Vesting Date”), provided that (a) the Committee has certified that the Company has achieved a level of Average Annual Return on Invested Capital (as defined below) of at least 10 percent for the three (3) year period from January 1, 2020 to December 31, 2022 (the “Performance Period”), and (b) the Grantee remains in the continuous employ of or service with the Company or any Subsidiary until the Vesting Date. The number of Award Units that will Vest on the Vesting Date will be determined in accordance with Section 2.2 below.

2.2 Determining Number of Vested Units. The following chart sets forth the percentage of the Award Units (or of a portion of the Award Units as provided in Section 5.1 of this Agreement) that will vest on the Vesting Date based upon the Company’s level of achievement of Average Annual Return on Invested Capital for the Performance Period:

Average Annual Return on Invested Capital Level	Vested Award Unit Percentage
Threshold Level — 10%	40%
Maximum Level — 15%	100%

The actual percentage of Award Units that will Vest based upon the Company's achievement of Average Annual Return on Invested Capital between the Threshold Level and Maximum Level will be interpolated on a straight line basis, with the corresponding number of Vested Award Units resulting from such determination rounded up to the next whole Award Unit. If the Average Annual Return on Invested Capital for the Performance Period is below the Threshold Level, no Award Units will Vest. Any Award Units that do not Vest on the Vesting Date will be forfeited.

2.3 Committee Certification. The Committee shall certify the level of average annual Return on Invested Capital for the Performance Period and the percentage of Award Units that Vest as provided in Section 2.2 above no later than March 1, 2023.

2.4 Definitions and Calculations. For purposes of this Agreement, the following amounts and terms shall be calculated and defined as follows:

(a) "Average Annual Return on Invested Capital" shall be calculated by dividing (i) the average of the Company's Net Operating Profit After Taxes (as defined below) for each of the three fiscal years during the Performance Period, by (ii) the average of the Company's Invested Capital (as defined below) as of the last day of the fiscal quarter immediately preceding the Performance Period and the last day of each fiscal quarter during the Performance Period.

(b) "Net Operating Profit After Taxes" is defined as the Company's operating income multiplied by 1 minus the Company's effective tax rate, each as reported in the Company's consolidated financial statements for each fiscal year during the Performance Period, adjusted to eliminate (i) the after-tax effect of additional depreciation and amortization expense resulting from fair value adjustments to assets acquired as part of the Company's acquisitions of Nalco Holding Company (the "Nalco acquisition") and Permian Mud Service, Inc., the parent company of Champion Technologies, Inc. and Corsicana Technologies, Inc. (the "Champion acquisition") and the after-tax effect of special gains and charges related to the Nalco acquisition and the Champion acquisition of the types described in materials presented to the Committee on the Date of Grant; (ii) the after-tax effects of any acquisition occurring during the Performance Period that was approved by the Board; and (iii) (A) the cumulative effects of accounting or tax changes, (B) gains and losses from discontinued operations, (C) the cumulative effect of events occurring during the Performance Period that are unusual in nature or occur infrequently or both, and (D) charges for restructurings, each as defined by generally accepted accounting principles and as identified in the Company's financial statements (including accompanying notes), management's discussion and analysis or other filings with the Securities and Exchange Commission by the Company.

(c) "Invested Capital" is defined as the Company's (i) total assets less cash and cash equivalents, minus (ii) total liabilities less short-term and long-term debt, each as reported by the Company as of the end of the fiscal quarters described in Section 2.4(a) and adjusted to eliminate (A) the goodwill, fair value adjustments to inventory, intangible assets and property, plant and equipment, and deferred tax liabilities arising from such fair value adjustments associated with the Nalco acquisition and the Champion acquisition, and (B) the impact of the same factors identified in clauses (ii) and (iii) of Section 2.4(b).

2.5 Committee Discretion. The Committee may adjust the calculation of Average Annual Return on Invested Capital applicable to the Award Units under the circumstances, for the purpose and to the extent contemplated by Section 3.2(c) of the Plan. Further, the actual number of Award Units that become Vested based upon achieving the specified level of Average Annual Return on Invested Capital during the Performance Period may be adjusted (but only downward if the Grantee is a Covered Employee and this Award is intended to be Performance-Based Compensation subject to Section 17 of the Plan) by the Committee in its sole and absolute discretion based on such factors as the Committee determines to be appropriate and/or advisable.

ARTICLE 3. SETTLEMENT OF VESTED AWARD UNITS.

Except as may otherwise be provided in Section 5.2 below, Vested Award Units will be paid to the Grantee by no later than March 15, 2023. Each Vested Award Unit will be paid to the Grantee in one share of Common Stock, provided that the Company will have no obligation to issue shares of Common Stock pursuant to this Agreement unless and until the Grantee has satisfied any applicable tax obligations pursuant to Article 9 below and such issuance otherwise complies with all applicable law. Prior to the time the Vested Award Units are settled, the Grantee will have no rights other than those of a general creditor of the Company. The Award Units represent an unfunded and unsecured obligation of the Company.

ARTICLE 4. GRANT RESTRICTIONS.

4.1 Transferability. Any attempt to transfer, assign or encumber the Award Units other than in accordance with this Agreement and the Plan will be null and void, and will result in the immediate termination and forfeiture of the Award and all Award Units that have not yet Vested.

4.2 Dividends and Other Distributions. Subject to Article 6 of this Agreement, the Grantee will have no right to receive dividends, dividend equivalents or other distributions with respect to Award Units.

ARTICLE 5. TERMINATION OF EMPLOYMENT OR OTHER SERVICE; CHANGE IN CONTROL.

5.1 Termination of Employment or Other Service. This Award is considered a Stock Unit Award subject to a service-based vesting condition and to the achievement of a specified Performance Criterion as a condition to vesting for purposes of Section 12 of the Plan. Except as otherwise provided in this Section 5.1, the effect of the termination of the Grantee's employment or other service with the Company and all Subsidiaries prior to the Vesting Date of this Award will be as provided in Sections 12.1(c), 12.2(c), 12.3(b) and 12.5 of the Plan. If the Grantee's employment by or other service with the Company and all Subsidiaries is terminated by the Company or any Subsidiary without Cause prior to the Vesting Date, then (i) for purposes of Section 2.1(b) of this Agreement, the Grantee will be deemed to have been in the continuous employ of or service with the Company or any Subsidiary until the Vesting Date with respect to one-third of the Award Units if such termination occurs during the second year of the Performance Period and with respect to two-thirds of the Award Units if the such termination occurs during the third year of the Performance Period, and (ii) for purposes of determining the number of Vested Award Units on the Vesting Date under Section 2.2 of this Agreement, the Vested Award Unit Percentage determined in accordance with Section 2.2 will be applied to the number of Award Units as to which the service-based vesting condition is deemed satisfied in accordance with clause (i) of this sentence, rather than to the total number of Award Units.

5.2 Change in Control. If a Change in Control occurs prior to the Vesting Date, the effect on this Award shall be as provided in Section 14.2 of the Plan. If vesting of Award Units should be accelerated in accordance with Section 14.2 of the Plan, Vested Unit Awards will be settled and paid to the Grantee no later than two and one-half months after the end of the Grantee's taxable year in which the Award Units became Vested.

ARTICLE 6. ADJUSTMENTS.

The number and kind of securities subject to this Award will be subject to adjustment under the circumstances and to the extent specified in Section 4.3 of the Plan.

ARTICLE 7. RIGHTS AS A STOCKHOLDER.

The Grantee will have no rights as a stockholder with respect to any of the Award Units until the Award Units are settled following vesting and the Grantee becomes the holder of record of shares of Common Stock.

ARTICLE 8. EMPLOYMENT OR SERVICE.

Nothing in this Agreement will be construed to (a) limit in any way the right of the Company to terminate the employment or service of the Grantee at any time, or (b) be evidence of any agreement or understanding, express or implied, that the Company will retain the Grantee in any particular position at any particular rate of compensation or for any particular period of time.

ARTICLE 9. WITHHOLDING TAXES.

By accepting this Award, the Grantee (i) acknowledges his or her obligation to pay any federal, foreign, state and local withholding or employment-related taxes attributable to this Award as provided in Section 13 of the Plan, and (ii) consents and directs the Company or its third party administrator to withhold the number of shares of Common Stock issuable upon the vesting of some or all of the Award Units as the Company, in its sole discretion, deems necessary to satisfy such withholding obligations. For purposes of satisfying the Grantee's withholding and employment-related tax obligations, shares withheld by the Company will be valued at their Fair Market Value on the date of settlement.

ARTICLE 10. PERFORMANCE-BASED COMPENSATION.

Any payment of Common Stock received for the Vested Award Units is intended to qualify as "performance-based compensation" for purposes of Section 162(m) of the Internal Revenue Code, and no action will be taken which would cause such payment to fail to satisfy the requirements of such exemption.

ARTICLE 11. AUTHORIZATION TO RELEASE AND TRANSFER NECESSARY PERSONAL INFORMATION.

The Grantee hereby explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Grantee's personal data by and among, as applicable, the Company and its Subsidiaries for the exclusive purpose of implementing, administering and managing the Grantee's participation in the Plan. The Grantee understands that the Company may hold certain personal information about the Grantee, including, but not limited to, the Grantee's name, home address and telephone number, date of birth, social security number (or any other social or national identification number), salary, nationality, job title, number of Award Units and/or shares of Common Stock held and the details of all Award Units or any other entitlement to shares of Common Stock awarded, cancelled, vested, unvested or outstanding for the purpose of implementing, administering and managing the Grantee's participation in the Plan (the "Data"). The Grantee understands that the Data may be transferred to the Company or to any third parties assisting in the implementation, administration and management of the Plan, that these recipients may be located in the Grantee's country or elsewhere, and that any recipient's country (e.g., the United States) may have different data privacy laws and protections than the Grantee's country. The Grantee understands that he or she may request a list with the names and addresses of any potential recipients of the Data by contacting his or her local human resources representative or the Company's stock plan administrator. The Grantee authorizes the recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, for the sole purpose of implementing, administering and managing the Grantee's participation in the Plan, including any requisite transfer of such Data to a broker or other third party assisting with the administration of Award Units under the Plan or with whom shares of Common Stock acquired pursuant to the vesting of the Award Units or cash from the sale of such shares may be deposited. Furthermore, the Grantee acknowledges and understands that the transfer of the Data to the Company or to any third parties is necessary for the Grantee's participation in the Plan. The Grantee understands that the Grantee may, at any time, view the Data, request additional information about the storage and processing of the Data, require any necessary amendments to the Data or refuse or withdraw the consents herein by contacting the Grantee's local human resources representative or the Company's stock plan administrator in writing. The Grantee further acknowledges that withdrawal of consent may affect his or her ability to vest in or realize benefits from the Award Units, and the Grantee's ability to participate in the Plan. For more information on the consequences of refusal to consent or withdrawal of consent, the Grantee understands that he or she may contact his or her local human resources representative or the Company's stock plan administrator.

ARTICLE 12. SUBJECT TO PLAN.

12.1 Terms of Plan Prevail. The Award and the Award Units granted pursuant to this Agreement have been granted under, and are subject to the terms of, the Plan. The terms of the Plan are incorporated by reference in this Agreement in their entirety, and the Grantee acknowledges having received a copy of the Plan. The provisions of this Agreement will be interpreted as to be consistent with the Plan, and any ambiguities in this Agreement will be interpreted by reference to the Plan. In the event that any provision in this Agreement is inconsistent with the terms of the Plan, the terms of the Plan will prevail. References in this Agreement to specific Sections of the Plan refer to those Sections of the Plan as in effect on the Date of Grant.

12.2 Definitions. Unless otherwise defined in this Agreement, the terms capitalized in this Agreement have the same meanings as given to such terms in the Plan.

ARTICLE 13. MISCELLANEOUS.

13.1 Binding Effect. This Agreement will be binding upon the heirs, executors, administrators and successors of the parties hereto.

13.2 Governing Law. This Agreement and all rights and obligations under this Agreement will be construed in accordance with the Plan and governed by the laws of the State of Minnesota without regard to conflicts of law provisions. Any legal proceeding related to this Agreement will be brought in an appropriate Minnesota court, and the parties to this Agreement consent to the exclusive jurisdiction of the court for this purpose.

13.3 Entire Agreement. This Agreement and the Plan set forth the entire agreement and understanding of the parties hereto with respect to the grant, vesting and payment of this Award and the administration of the Plan and supersede all prior agreements, arrangements, plans and understandings relating to the grant, vesting and payment of this Award and the administration of the Plan.

13.4 Amendment and Waiver. Other than as provided in the Plan, this Agreement may be amended, waived, modified or canceled only by a written instrument executed by the parties hereto or, in the case of a waiver, by the party waiving compliance.

13.5 Captions. The Article, Section and paragraph captions in this Agreement are for convenience of reference only, do not constitute part of this Agreement and are not to be deemed to limit or otherwise affect any of the provisions of this Agreement.

13.6 Electronic Delivery and Execution. The Grantee hereby consents and agrees to electronic delivery of any documents that the Company may elect to deliver (including, but not limited to, plan documents, prospectus and prospectus supplements, grant or award notifications and agreements, account statements, annual and quarterly reports, and all other forms of communications) in connection with this and any other Incentive Award made or offered under the Plan. The Grantee understands that, unless revoked by giving written notice to the Company pursuant to the Plan, this consent will be effective for the duration of the Agreement. The Grantee also understands that the Grantee will have the right at any time to request that the Company deliver written copies of any and all materials referred to above. The Grantee hereby consents to any and all procedures the Company has established or may establish for an electronic signature system for delivery and acceptance of any such documents that the Company may elect to deliver, and agrees that the Grantee's electronic signature is the same as, and will have the same force and effect as, the Grantee's manual signature. The Grantee consents and agrees that any such procedures and delivery may be effected by a third party engaged by the Company to provide administrative services related to the Plan.

13.7 Address for Notice. All notices to the Company shall be in writing and sent to the Company's General Counsel at the Company's corporate headquarters. Notices to the Grantee shall be addressed to the Grantee at the address as from time to time reflected in the Company's or Subsidiary's employment records as the Grantee's address.

13.8 Severability. In the event that any provision in this Agreement shall be held invalid or unenforceable, such provision shall be severable from, and such invalidity or unenforceability shall not be construed to have any effect on, the remaining provisions of this Agreement.

13.9 Appendix. Notwithstanding any provision of this Agreement to the contrary, this grant of Award Units and the shares of Common Stock acquired under the Plan shall be subject to any and all special terms and provisions, if any, as set forth in the Appendix for the Grantee's country of residence.

13.10 Counterparts. For the convenience of the parties hereto, this Agreement may be executed in any number of counterparts, each such counterpart to be deemed an original instrument, and all such counterparts together to constitute the same agreement.

The parties to this Agreement have executed this Agreement effective the day and year first above written.

ECOLAB INC. (the "Company")
RESTRICTED STOCK UNIT AWARD AGREEMENT

ARTICLE 1. GRANT OF AWARD.

The Company has adopted the Ecolab Inc. 2010 Stock Incentive Plan, as amended and restated effective May 2, 2013 (the "Plan") to grant restricted Stock Unit Awards to certain employees of the Company and its Subsidiaries. The Company hereby grants to you (the "Grantee") on the date set forth in your grant notice (the "Date of Grant") a restricted Stock Unit Award (the "Award") consisting of the number of units set forth in the Grantee's grant notice (the "Award Units"), each of which is a bookkeeping entry representing the right to receive one share of the Company's common stock, par value \$1.00 per share (the "Common Stock"). The Award and Award Units are subject to the terms, conditions, restrictions and risk of forfeiture set forth in this agreement (the "Agreement") and in the Plan.

ARTICLE 2. GRANT CONDITIONS AND RESTRICTIONS.

2.1 Vesting of Award Units. Subject to Section 2.4 and Article 3 of this Agreement, restrictions on the Award Units will lapse and the Award Units will vest on the third anniversary of the Date of Grant (such date, the "Vesting Date"), provided the Grantee remains in the continuous employ or service of the Company or any Subsidiary through the Vesting Date. The period from the Date of Grant to the Vesting Date is referred to in this Agreement as the "Restriction Period."

2.2 Restrictions on Transferability. Any attempt to transfer, assign or encumber the Award Units other than in accordance with this Agreement and the Plan will be null and void, and will result in the immediate termination and forfeiture of the Award.

2.3 Dividends and Other Distributions. The Grantee will have no right to receive dividends, dividend equivalents or other distributions with respect to Award Units.

2.4 Change in Control. If a Change in Control occurs during the Restriction Period, the effect on this Award shall be as provided in Section 14.2 of the Plan. If vesting of Award Units should be accelerated in accordance with Section 14.2(b) of the Plan, such vested Award Units will be settled and paid to the Grantee as provided in Article 4. If Award Units should be assumed in accordance with Section 14.2(a) of the Plan and then accelerated in accordance with Section 14.2(d) of the Plan, such vested Award Units will be settled and paid to the Grantee as soon as administratively practicable following such involuntary termination of employment or other service by the Company or its Subsidiaries for reasons other than Cause or a termination of employment or other service by the Grantee for Good Reason, in any event, no later than thirty (30) days thereafter.

ARTICLE 3. TERMINATION OF EMPLOYMENT OR OTHER SERVICE.

3.1 Generally. This Award is subject only to service-based vesting conditions for purposes of Section 12 of the Plan. Except as otherwise provided in this Article 3 or in Section 2.4 of this Agreement, the effect of the termination of the Grantee's employment or other service with the Company and its Subsidiaries prior to the Vesting Date shall be as provided in Sections 12.3(b) and 12.5 of the Plan.

3.2 Termination of Employment or Other Service Due to Death or Disability. Notwithstanding Section 12.1 of the Plan, if the Grantee's employment or other service with the Company and its Subsidiaries is terminated by reason of death or Disability then the Award Units shall remain outstanding and, subject to Section 12.5 of the Plan, be settled as provided in Article 4.

3.3 Termination of Employment or Other Service Due to Retirement. Notwithstanding Section 12.2 of the Plan or Section 3.4 of this Agreement, if the Grantee's employment or other service with the Company and its Subsidiaries is terminated by reason of the Grantee's Retirement, then (x) the Award Units shall terminate and be forfeited by the Grantee if such termination of employment or other service due to Retirement occurs within six (6) months following the Date of Grant, and (y) the Award Units shall remain outstanding if such termination of employment or other service due to Retirement occurs six (6) or more months following the Date of Grant and, subject to Section 12.5 of the Plan, shall be settled as provided in Article 4.

3.4 Termination of Employment or Other Service for Reasons Other than Cause. Notwithstanding Section 12.3 of the Plan and except as otherwise provided in Section 2.4 of this Agreement, if the Grantee's employment or other service with the Company and its Subsidiaries is involuntarily terminated by the Company or its Subsidiaries for reasons other than Cause prior to the Vesting Date, then (x) the Award Units shall terminate and be forfeited by the Grantee if such termination of employment or other service occurs prior to the first anniversary of the Date of Grant, (y) 1/3 of the Award Units shall remain outstanding if such termination of employment or other service occurs on or following the first anniversary of the Date of Grant but prior to the second anniversary of the Date of Grant (and the remainder shall terminate and be forfeited), and (x) 2/3 of the Award Units shall remain outstanding if such termination of employment or other service occurs on or following the second anniversary of the Date of Grant but prior to the third anniversary of the Date of Grant (and the remainder shall terminate and be forfeited). Subject to Section 12.5 of the Plan, Award Units that remain outstanding in accordance with this Section 3.4 shall be settled as provided in Article 4.

ARTICLE 4. SETTLEMENT OF VESTED AWARD UNITS.

Award Units that vest or remain outstanding in accordance with Article 2 and Article 3 ("Vested Award Units") will be settled and paid to the Grantee as soon as administratively practicable following the Vesting Date and, in any event, no later than the fifteenth day of the third month following the Vesting Date; provided, that if Award Units are assumed in accordance with Section 14.2(a) of the Plan and then accelerated in accordance with Section 14.2(d) of the Plan, then such Vested Award Units shall be settled and paid to the grantee in accordance with Section 2.4 of this Agreement. Each vested Award Unit will be paid to the Grantee in one share of Common Stock, provided that the Company will have no obligation to issue shares of Common Stock pursuant to this Agreement unless and until the Grantee has satisfied any applicable tax obligations pursuant to Article 8 below and such issuance otherwise complies with all applicable law. Prior to the time the vested Award Units are settled, the Grantee will have no rights other than those of a general creditor of the Company. The Award Units represent an unfunded and unsecured obligation of the Company.

ARTICLE 5. ADJUSTMENTS.

The number and kind of securities subject to this Award will be subject to adjustment under the circumstances and to the extent specified in Section 4.3 of the Plan.

ARTICLE 6. RIGHTS AS A STOCKHOLDER.

The Grantee will have no rights as a stockholder with respect to any of the Award Units until the Award Units are settled following vesting and the Grantee becomes the holder of record of shares of Common Stock.

ARTICLE 7. EMPLOYMENT OR SERVICE.

Nothing in this Agreement will be construed to (a) limit in any way the right of the Company to terminate the employment or service of the Grantee at any time, or (b) be evidence of any agreement or understanding, express or implied, that the Company will retain the Grantee in any particular position at any particular rate of compensation or for any particular period of time.

ARTICLE 8. WITHHOLDING TAXES.

By accepting this Award, the Grantee (i) acknowledges his or her obligation to pay any federal, foreign, state and local withholding or employment-related taxes attributable to this Award as provided in Section 13 of the Plan, and (ii) consents and directs the Company or its third party administrator to withhold the number of shares of Common Stock issuable upon the vesting of some or all of the Award Units as the Company, in its sole discretion, deems necessary to satisfy such withholding obligations. For purposes of satisfying the Grantee's withholding and employment-related tax obligations, shares withheld by the Company will be valued at their Fair Market Value on the date of settlement.

ARTICLE 9. AUTHORIZATION TO RELEASE AND TRANSFER NECESSARY PERSONAL INFORMATION.

The Grantee hereby explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Grantee's personal data by and among, as applicable, the Company and its Subsidiaries for the exclusive purpose of implementing, administering and managing the Grantee's participation in the Plan. The Grantee understands that the Company may hold certain personal information about the Grantee, including, but not limited to, the Grantee's name, home address and telephone number, date of birth, social security number (or any other social or national identification number), salary, nationality, job title, number of Award Units and/or shares of Common Stock held and the details of all Award Units or any other entitlement to shares of Common Stock awarded, cancelled, vested, unvested or outstanding for the purpose of implementing, administering and managing the Grantee's participation in the Plan (the "Data"). The Grantee understands that the Data may be transferred to the Company or to any third parties assisting in the implementation, administration and management of the Plan, that these recipients may be located in the Grantee's country or elsewhere, and that any recipient's country (e.g., the United States) may have different data privacy laws and protections than the Grantee's country. The Grantee understands that he or she may request a list with the names and addresses of any potential recipients of the Data by contacting his or her local human resources representative or the Company's stock plan administrator. The Grantee authorizes the recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, for the sole purpose of implementing, administering and managing the Grantee's participation in the Plan, including any requisite transfer of such Data to a broker or other third party assisting with the administration of Award Units under the Plan or with whom shares of Common Stock acquired pursuant to the vesting of the Award Units or cash from the sale of such shares may be deposited. Furthermore, the Grantee acknowledges and understands that the transfer of the Data to the Company or to any third parties is necessary for the Grantee's participation in the Plan. The Grantee understands that the Grantee may, at any time, view the Data, request additional information about the storage and processing of the Data, require any necessary amendments to the Data or refuse or withdraw the consents herein by contacting the Grantee's local human resources representative or the Company's stock plan administrator in writing. The Grantee further acknowledges that withdrawal of consent may affect his or her ability to vest in or realize benefits from the Award Units, and the Grantee's ability to participate in the Plan. For more information on the consequences of refusal to consent or withdrawal of consent, the Grantee understands that he or she may contact his or her local human resources representative or the Company's stock plan administrator.

ARTICLE 10. SUBJECT TO PLAN.

10.1 Terms of Plan Prevail. The Award and the Award Units granted pursuant to this Agreement have been granted under, and are subject to the terms of, the Plan. The terms of the Plan are incorporated by reference in this Agreement in their entirety, and the Grantee acknowledges having received a copy of the Plan. The provisions of this Agreement will be interpreted as to be consistent with the Plan, and any ambiguities in this Agreement will be interpreted by reference to the Plan. In the event that any provision in this Agreement is inconsistent with the terms of the Plan, the terms of the Plan will prevail. References in this Agreement to specific Sections of the Plan refer to those Sections of the Plan as in effect on the Date of Grant.

10.2 Definitions. Unless otherwise defined in this Agreement, the terms capitalized in this Agreement have the same meanings as given to such terms in the Plan, as in effect on the Date of Grant.

ARTICLE 11. MISCELLANEOUS.

11.1 Binding Effect. This Agreement will be binding upon the heirs, executors, administrators and successors of the parties hereto.

11.2 Governing Law. This Agreement and all rights and obligations under this Agreement will be construed in accordance with the Plan and governed by the laws of the State of Minnesota without regard to conflicts of law provisions. Any legal proceeding related to this Agreement will be brought in an appropriate Minnesota court, and the parties to this Agreement consent to the exclusive jurisdiction of the court for this purpose.

11.3 Entire Agreement. This Agreement and the Plan set forth the entire agreement and understanding of the parties hereto with respect to the grant, vesting and payment of this Award and the administration of the Plan and supersede all prior agreements, arrangements, plans and understandings relating to the grant, vesting and payment of this Award and the administration of the Plan.

11.4 Amendment and Waiver. Other than as provided in the Plan, this Agreement may be amended, waived, modified or canceled only by a written instrument executed by the parties hereto or, in the case of a waiver, by the party waiving compliance.

11.5 Captions. The Article, Section and paragraph captions in this Agreement are for convenience of reference only, do not constitute part of this Agreement and are not to be deemed to limit or otherwise affect any of the provisions of this Agreement.

11.6 Electronic Delivery and Execution. The Grantee hereby consents and agrees to electronic delivery of any documents that the Company may elect to deliver (including, but not limited to, plan documents, prospectus and prospectus supplements, grant or award notifications and agreements, account statements, annual and quarterly reports, and all other forms of communications) in connection with this and any other Incentive Award made or offered under the Plan. The Grantee understands that, unless revoked by giving written notice to the Company pursuant to the Plan, this consent will be effective for the duration of the Agreement. The Grantee also understands that the Grantee will have the right at any time to request that the Company deliver written copies of any and all materials referred to above. The Grantee hereby consents to any and all procedures the Company has established or may establish for an electronic signature system for delivery and acceptance of any such documents that the Company may elect to deliver, and agrees that the Grantee's electronic signature is the same as, and will have the same force and effect as, the Grantee's manual signature. The Grantee consents and agrees that any such procedures and delivery may be effected by a third party engaged by the Company to provide administrative services related to the Plan.

11.7 Address for Notice. All notices to the Company shall be in writing and sent to the Company's General Counsel at the Company's corporate headquarters. Notices to the Grantee shall be addressed to the Grantee at the address as from time to time reflected in the Company's or Subsidiary's employment records as the Grantee's address.

11.8 Severability. In the event that any provision in this Agreement shall be held invalid or unenforceable, such provision shall be severable from, and such invalidity or unenforceability shall not be construed to have any effect on, the remaining provisions of this Agreement.

11.9 Appendix. Notwithstanding any provision of this Agreement to the contrary, this grant of Award Units and the shares of Common Stock acquired under the Plan shall be subject to any and all special terms and provisions, if any, as set forth in the Appendix for the Grantee's country of residence.

11.10. Section 409A Compliance. The intent of the parties is that payments and benefits under this Agreement comply with Section 409A of Code to the extent subject thereto, and, accordingly, to the maximum extent permitted, this Agreement shall be interpreted and be administered to be in compliance therewith. Notwithstanding anything contained herein to the contrary, to the extent required in order to avoid accelerated taxation and/or tax penalties under Section 409A of the Code, the Grantee shall not be considered to have separated from service with the Company or its Subsidiaries for purposes of this Agreement and no payment or settlement shall be due to the Grantee under this Agreement on account of a separation from service until the Grantee would be considered to have incurred a "separation from service" from the Company or its Subsidiaries within the meaning of Section 409A of the Code. Any payments described in this Agreement that are due within the "short-term deferral period" as defined in Section 409A of the Code shall not be treated as deferred compensation unless applicable law requires otherwise. Notwithstanding anything to the contrary in this Agreement, to the extent that any RSUs are payable upon a separation from service and such payment would result in the imposition of any individual income tax and late interest charges imposed under Section 409A of the Code, the settlement and payment of such awards shall instead be made on the first business day after the date that is six (6) months following such separation from service (or death, if earlier). The Company makes no representation that any or all of the payments described in this Agreement will be exempt from or comply with Section 409A of the Code and makes no undertaking to preclude Section 409A of the Code from applying to any such payment. The Grantee shall be solely responsible for the payment of any taxes and penalties incurred under Section 409A of the Code.

Notwithstanding any provision in this Agreement or the Plan to the contrary, with respect to any Award (or portion thereof) that constitutes deferred compensation under Section 409A of the Code, to the extent required to avoid additional tax under Section 409A of the Code with respect to such Award, the Change in Control must also be a "change in control event" described in Treasury Regulations Section 1.409A-3(i)(5) or successor guidance. If all or a portion of an Award constitutes deferred compensation under Section 409A of the Code and such Award (or portion thereof) is to be settled, distributed or paid on an accelerated basis due to a Change in Control event that is not a "change in control event" described in Treasury Regulation Section 1.409A-3(i)(5) or successor guidance, if such settlement, distribution or payment would result in additional tax under Section 409A of the Code, such Award (or the portion thereof) shall vest at the time of the Change of Control (provided such accelerated vesting will not result in additional tax under Section 409A of the Code), but settlement, distribution or payment, as the case may be, shall not be accelerated.

**APPENDIX FOR NON-U.S. GRANTEES
ADDITIONAL TERMS AND CONDITIONS TO TIME-BASED RESTRICTED STOCK UNIT
AWARD AGREEMENT**

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This Appendix includes the following additional terms and conditions that govern the Grantee's Award Units for all Grantees that reside and/or work outside of the United States.

Notifications

This Appendix also includes notifications regarding exchange controls and other regulatory issues of which the Grantee should be aware with respect to the Grantee's participation in the Plan. The information is based on the securities, exchange control and other laws in effect in the respective countries as of **November 2018**. Such laws are often complex and change frequently. As a result, the Company strongly recommends that the Grantee not rely on the information in this Appendix as the only source of information relating to the consequences of the Grantee's participation in the Plan because the information may be out of date at the time that the Stock Unit Awards ("Award Units") vest, or shares of Common Stock ("Shares") are delivered in settlement of the Award Units, or the Grantee sells any Shares acquired under the Plan.

In addition, the information contained herein is general in nature and may not apply to the Grantee's particular situation, further the Company, its Subsidiaries, nor the Company's stock plan administrator ("Administrator") is in a position to assure the Grantee of a particular result. Accordingly, the Grantee is advised to seek appropriate professional advice as to how the relevant laws in the Grantee's country of residence and/or work may apply to the Grantee's situation.

Finally, if the Grantee transfers employment after the Date of Grant, or is considered a resident of another country for local law purposes following the Date of Grant, the notifications contained herein may not be applicable to the Grantee, and the Administrator shall, in its discretion, determine to what extent the terms and conditions contained herein shall be applicable to the Grantee.

Terms and Conditions Applicable to All Non-U.S. Jurisdictions

English Language. The Grantee acknowledges and agrees that it is the Grantee's express intent that this Agreement, the Plan and all other documents, rules, procedures, forms, notices and legal proceedings entered into, given or instituted pursuant to the Award Unit, be drawn up in English. If the Grantee has received this Agreement, the Plan or any other rules, procedures, forms or documents related to the Award Unit translated into a language other than English, and if the meaning of the translated version is different than the English version, the English version will control.

Compliance with Laws: Repatriation of Proceeds. The Grantee agrees, as a condition of the grant of the Award Unit, to repatriate all payments attributable to the Award Unit and/or cash acquired under the Plan (including, but not limited to, dividends, dividend equivalents, and any proceeds derived from the sale of the Shares acquired pursuant to the Agreement) in accordance with local law and all foreign exchange control rules and regulations applicable to the Grantee. The Company and the Administrator reserve the right to impose other requirements on the Grantee's participation in the Plan, on the Award Units and on any Shares acquired or cash payments made pursuant to the Agreement, to the extent the Company, its Subsidiaries or the Administrator determines it is necessary or advisable in order to comply with local law or to facilitate the administration of the Plan, and to require the Grantee to sign any additional agreements or undertakings that may be necessary to accomplish the foregoing. Finally, the Grantee agrees to take any and all actions as may be required to comply with the Grantee's personal legal and tax obligations under all laws, rules and regulations applicable to the Grantee.

Commercial Relationship. The Grantee expressly recognizes that the Grantee's participation in the Plan and the Company's Award Unit grant does not constitute an employment relationship between the Grantee and the Company. The Grantee has been granted Award Units as a consequence of the commercial relationship between the Company and the Subsidiary that employs the Grantee, and the Subsidiary is the Grantee's sole employer. Based on the foregoing, (a) the Grantee expressly recognizes the Plan and the benefits the Grantee may derive from participation in the Plan do not establish any rights between the Grantee and the Subsidiary that employs the Grantee, (b) the Plan and the benefits the Grantee may derive from participation in the Plan are not part of any employment conditions and/or benefits provided by the Subsidiary that employs the Grantee, and (c) any modifications or amendments of the Plan by the Company or the Administrator, or a termination of the Plan by the Company, shall not constitute a change or impairment of the terms and conditions of the Grantee's employment with the Subsidiary that employs the Grantee.

Private Placement. The grant of the Award Units is not intended to be a public offering of securities in the Grantee's country of residence and/or employment but instead is intended to be a private placement. As a private placement, the Company has not submitted any registration statement, prospectus or other filings with the local securities authorities (unless otherwise required under local law), and the grant of the Award Units is not subject to the supervision of the local securities authorities.

Insider Trading. The Grantee acknowledges that, depending on Grantee's or the Grantee's broker's country of residence or where the Company shares are listed, the Grantee may be subject to insider trading restrictions and/or market abuse laws which may affect the Grantee's ability to accept, acquire, sell or otherwise dispose of shares of Common Stock, rights to shares or rights linked to the value of shares of Common Stock during such times the Grantee is considered to have "inside information" regarding the Company as defined in the laws or regulations in the Grantee's country. Local insider trading laws and regulations may prohibit the cancellation or amendment of orders the Grantee placed before the Grantee possessed inside information. Furthermore, the Grantee could be prohibited from (i) disclosing the inside information to any third party (other than on a "need to know" basis) and (ii) "tipping" third parties or causing them otherwise to buy or sell securities. Third parties includes fellow employees. Any restrictions under these laws or regulations are separate from and in addition to any restrictions that may be imposed under the Company's insider trading policy. The Grantee acknowledges that it is the Grantee's responsibility to comply with any restrictions and is advised to speak to the Grantee's personal advisor on this matter.

Data Privacy. In addition to Article 8 of this Agreement, upon request of the Company or the employer, the Grantee agrees to provide an executed data privacy consent form to the Company and/or the employer (or any other agreements or consents that may be required by the Company and/or the employer) that the Company and/or the employer may deem necessary to obtain from the Grantee for the purpose of administering the Grantee's participation in the Plan in compliance with the data privacy laws in my country, either now or in the future. The Grantee understands and agrees that the Grantee will not be able to participate in the Plan if the Grantee fails to provide any such consent or agreement requested by the Company and/or the employer.

Additional Acknowledgements. The **GRANTEE** also acknowledges and agrees to the following:

- The grant of the Award Unit is voluntary and occasional and does not create any contractual or other right to receive future grants of Award Units or benefits in lieu of the Award Unit even if Award Units have been granted repeatedly in the past.
- The future value of the Shares and any related dividends or dividend equivalents is unknown and cannot be predicted with certainty.
- No claim or entitlement to compensation or damages arises from the forfeiture of the Award Unit or any of the Award Units or related dividend equivalents, the termination of the Plan, or the diminution in value of the Award Units or Shares, and the Grantee irrevocably releases the Company, its Subsidiaries, the Administrator and their affiliates from any such claim that may arise.
- None of the Company, its Subsidiaries, nor the Administrator is providing any tax, legal or financial advice or making any recommendations regarding the Grantee's participation in the Plan, the grant, vesting or settlement of the Grantee's Award Units, or the Grantee's acquisition or sale of the Shares delivered in settlement of the Award Units. The Grantee is hereby advised to consult with his own personal tax, legal and financial advisors regarding his participation in the Plan before taking any action related to the Plan.

Terms and Conditions Applicable to European Union (“EU”) / European Economic Area (“EEA”)

Data Privacy. If the Grantee resides and/or is employed in the EU/EEA, Article 8 of the Agreement shall be replaced with the following:

The Company is located at 1 Ecolab Place, Saint Paul, Minnesota, 55102, U.S.A. and grants Award Units under the Plan to employees of the Company and its Subsidiaries in its sole discretion. The Grantee should review the following information about the Company’s data processing practices.

Data Collection and Usage. Pursuant to applicable data protection laws, the Grantee is hereby notified that the Company collects, processes and uses certain personally-identifiable information about the Grantee for the legitimate interest of implementing, administering and managing the Plan and generally administering equity awards; specifically, including the Grantee’s name, home address, email address and telephone number, date of birth, social insurance number or other identification number, salary, citizenship, job title, any Shares or directorships held in the Company, and details of all Award Units or any entitlement to Shares awarded, canceled, exercised, vested, or outstanding in the Grantee’s favor, which the Company receives from the Grantee or the Grantee’s employer. In granting the Award Units under the Plan, the Company will collect the Grantee’s personal data for purposes of allocating Shares and implementing, administering and managing the Plan. The Company’s collection, processing, use and transfer of your personal data is necessary for the performance of the Company’s contractual obligations under the Plan and pursuant to the Company’s legitimate interest of managing and generally administering employee equity awards. The Grantee’s refusal to provide personal data would make it impossible for the Company to perform its contractual obligations and may affect the Grantee’s ability to participate in the Plan. As such, by participating in the Plan, the Grantee voluntarily acknowledges the collection, processing and use of the Grantee’s personal data as described herein.

Stock Plan Administration Service Provider. *The Company transfers participant data to E*TRADE Financial Corporate Services, Inc. an independent service provider based in the United States, which assists the Company with the implementation, administration and management of the Plan. In the future, the Company may select a different service provider and share the Grantee’s data with another company that serves in a similar manner. The Company’s service provider will open an account for the Grantee to receive and trade Shares. The Grantee will be asked to agree on separate terms and data processing practices with the service provider, which is a condition to the Grantee’s ability to participate in the Plan.*

International Data Transfers. *The Company and its service providers are based in the United States. The Company can only meet its contractual obligations to the Grantee if the Grantee’s personal data is transferred to the United States. The Company’s legal basis for the transfer of the Grantee’s personal data to the United States is to satisfy its contractual obligations to the Grantee and/or its use of the standard data protection clauses adopted by the EU Commission.*

Data Retention. The Company will use the Grantee's personal data only as long as is necessary to implement, administer and manage the Grantee's participation in the Plan or as required to comply with legal or regulatory obligations, including under tax and securities laws. When the Company no longer needs the Grantee's personal data, the Company will remove it from its systems. If the Company keeps the Grantee's data longer, it would be to satisfy legal or regulatory obligations and the Company's legal basis would be for compliance with relevant laws or regulations.

Data Subject Rights. The Grantee may have a number of rights under data privacy laws in the Grantee's country of residence. For example, the Grantee's rights may include the right to (i) request access or copies of personal data the Company processes, (ii) request rectification of incorrect data, (iii) request deletion of data, (iv) place restrictions on processing, (v) lodge complaints with competent authorities in the Grantee's country, and/or (vi) request a list with the names and addresses of any potential recipients of the Grantee's personal data. To receive clarification regarding the Grantee's rights or to exercise the Grantee's rights, the Grantee should contact his or her local human resources department.

Terms and Conditions Applicable to Argentina

Securities Law Information. Award Units and Shares issued by the Company are offered as a private transaction. This offering is not subject to supervision by any Argentine governmental authority.

Exchange Control Information. The Grantee is solely responsible for complying with the exchange control rules that may apply in connection with Grantee's participation in the Plan and/or the transfer of proceeds acquired under the Plan into Argentina. Prior to vesting in the Award Units or transferring proceeds into Argentina, the Grantee should consult his or her local bank and exchange control advisor to confirm the exchange control rules and required documentation.

Terms and Conditions Applicable to Australia

Securities Law Information. If the Grantee acquires Shares under the Plan and subsequently offers the Shares for sale to a person or entity resident in Australia, such an offer may be subject to disclosure requirements under Australian law, and the Grantee should obtain legal advice regarding any applicable disclosure requirements prior to making any such offer.

Australian Addendum. The Grantee understands and agrees that the offer of the Award Unit is subject to the conditions of the relief instrument issued by the Australian Securities and Investment Commission (ASIC) and that information on where the Grantee may view the relief instrument has been made available to the Grantee in the offer document related to the offer of the Award Unit.

Terms and Conditions Applicable to Belgium

Tax Reporting. Belgian residents are required to report any security (e.g., shares of Common Stock acquired under the Plan) or bank account held outside of Belgium on their annual tax return. In a separate report, they will be required to provide the National Bank of Belgium with certain details regarding such foreign accounts (including the account number, bank name and country in which any such account was opened). The forms to complete this report are available at the website of the National Bank of Belgium. Belgian residents should consult with their personal tax advisors to determine their reporting obligations.

Brokerage Account Tax. A brokerage account tax may apply if the average annual value of the securities the Grantee holds (e.g., Shares acquired under the Plan) in a brokerage or other securities account exceeds certain thresholds. The Grantee understands that the calculation of this tax is complex and the Grantee should consult his or her personal tax advisor for details regarding this obligation.

Terms and Conditions Applicable to Brazil

Labor Law Acknowledgment. By accepting the Award Units, the Grantee agrees that the Grantee is (i) making an investment decision, (ii) shares of Common Stock will be issued to the Grantee only if the vesting conditions are met and (iii) the value of the underlying shares are not fixed and may increase or decrease in value over the vesting period without compensation to the Grantee.

Exchange Control Information. If the Grantee is a resident or domiciled in Brazil, the Grantee is required to submit annually a declaration of assets and rights held outside of Brazil to the Central Bank of Brazil if the aggregate value of such assets and rights is equal to or greater than US\$100,000. Assets and rights that must be reported include Shares acquired under the Plan.

Tax on Financial Transaction (IOF). Repatriation of funds into Brazil and the conversion between BRL and USD associated with such fund transfers may be subject to the Tax on Financial Transactions. It is Grantee's responsibility to comply with any applicable Tax on Financial Transactions arising from Grantee's participation in the Plan. Grantee should consult with his or her personal tax advisor for additional details.

Terms and Conditions Applicable to Canada

Award Units Payable Only in Shares. Notwithstanding any discretion in the Plan or anything to the contrary in the Agreement, the grant of Award Units does not provide any right for the Grantee to receive a cash payment, rather the Award Units are payable in Shares only.

Resale Restriction. The Grantee is permitted to sell the Shares acquired upon vesting through the designated broker appointed under the Plan, provided the resale of Shares acquired under the Plan takes place outside of Canada through the facilities of the stock exchange on which the shares are listed. The shares are currently listed on the New York Stock Exchange.

Termination Date. The Grantee ceases to be employed with the Company or its Subsidiaries on the later of (i) the date that is the last day of any statutory notice of termination period applicable to the Grantee pursuant to applicable employment standards legislation, and (ii) the date that is designated by the Company or any Subsidiary as the last day of the Grantee's employment with the Company or any Subsidiary. The date that the Grantee ceases to be employed by the Company or its Subsidiaries specifically does not mean the date on which any period of reasonable notice that the Company or any Subsidiary may be required at law to provide to the Grantee expires.

The following provision will apply if the Grantee is a resident of Quebec:

Use of English Language. The parties acknowledge that it is their express wish that the Agreement, including this Appendix, as well as all documents, notices, and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English.

Consentement relatif à la langue utilisée. Les parties reconnaissent avoir expressément souhaité que la convention («Agreement») ainsi que cette Annexe, ainsi que tous les documents, avis et procédures judiciaires, exécutés, donnés ou intentés en vertu de, ou liés directement ou indirectement à la présente convention, soient rédigés en langue anglaise.

Data Privacy Notice and Consent. This provision supplements Article 8 of this Agreement: The Grantee hereby authorizes the Company and the Company's representatives to discuss with and obtain all relevant information from all personnel, professional or not, involved in the administration and operation of the Plan. The Grantee further authorizes the Company and any Subsidiary or affiliate and the administrator of the Plan to disclose and discuss the Plan with their advisors. The Grantee further authorizes the Company and any Subsidiary or affiliate to record such information and to keep such information in the Grantee's employee file.

Terms and Conditions Applicable to Chile

Labor Law Acknowledgment. The Award Units and shares of Common Stock underlying the Award Units, and the income and value of same, shall not be considered as part of the Grantee's remuneration for purposes of determining the calculation base of future indemnities, whether statutory or contractual, for years of service (severance) or in lieu of prior notice, pursuant to Article 172 of the Chilean Labor Code.

No Offering of Securities in Chile. **In accordance with ruling n° 336 of the Chilean Commission for the Financial Markets ("CMF"), the grant of the Award Units hereunder is not intended to be a public offering of securities in Chile but instead is intended to be a private placement. As a private placement, the Company has not submitted any registration statement, prospectus or other filings with the local securities authorities, and the Plan is not subject to the supervision of the local securities authorities.**

Esta Oferta de Unidades de Acciones Restringidas constituye una oferta privada de valores en Chile y se inicia en la Fecha de la Oferta. Esta oferta de Unidades de Acciones Restringidas se acoge a las disposiciones de la Norma de Carácter General N° 336 ("NCG 336") de la Comisión para el Mercado Financiero Chilena ("CMF"). Esta oferta versa sobre valores no inscritos en el Registro de Valores o en el Registro de Valores Extranjeros que lleva la CMF, por lo que tales valores no están sujetos a la fiscalización de ésta. Por tratarse de valores no inscritos en Chile no existe la obligación por parte de la Compañía de entregar en Chile información pública respecto de los mismos. Estos valores no podrán ser objeto de oferta pública en Chile mientras no sean inscritos en el Registro de Valores correspondiente.

Exchange Control Notice. The Grantee is not required to repatriate funds obtained from the sale of Shares or the receipt of any dividends or dividend equivalents. However, if the Grantee decides to repatriate such funds, the Grantee must do so through the Formal Exchange Market (*i.e.*, a commercial bank or registered foreign exchange office in Chile) if the amount of the funds exceeds USD 10,000. In such case, the Grantee must report the payment to the commercial bank or registered foreign exchange office receiving the funds. If the Grantee does not repatriate the proceeds and uses such proceeds for the payment of other obligations contemplated under a different Chapter of the Foreign Exchange Regulations, the Grantee must sign Annex 1 of the Manual of Chapter XII of the Foreign Exchange Regulations and file it directly with the Central Bank of Chile within the first 10 days of the month immediately following the transaction.

The Grantee is responsible for complying with foreign exchange requirements in Chile. For general information purposes, as of the date hereof, the Grantee's aggregate investments held outside Chile exceed USD 5,000,000 (including the Shares and any other cash proceeds obtained under the Plan), the Grantee must report the investments annually to the Central Bank. Annex 3.1 of Chapter XII of the Foreign Exchange Regulations must be used to file this report. Please note that exchange control regulations in Chile are subject to change. The Grantee should consult with his or her personal legal advisor regarding any exchange control obligations that the Grantee may have prior to vesting in the RSUs, receiving proceeds from the sale of Shares acquired upon vesting of the RSUs or cash dividends or dividend equivalents.

Terms and Conditions Applicable to China (For PRC National Grantees)

Satisfaction of Regulatory Obligations. If the Grantee is a national of the Peoples' Republic of China ("PRC"), this grant is subject to additional terms and conditions, as determined by the Company in its sole discretion, in order for the Company to maintain the applicable approvals from the PRC State Administration of Foreign Exchange ("SAFE") and to permit the operation of the Plan in accordance with applicable PRC exchange control laws and regulations.

Exchange Control Requirements. The Grantee understands and agrees that, due to exchange control laws in China, the Grantee will be required to immediately repatriate the proceeds from the sale of Shares and any dividends received in relation to the Shares to China. The Grantee further understands that the repatriation of such amounts may need to be effected through a special exchange control account established by the Company or the Subsidiary in China, and the Grantee hereby consents and agrees that all amounts derived from the Award Unit granted under the Plan may be transferred to such special account prior to being delivered to the Grantee's personal account. Further, the Grantee specifically authorizes the Company, the Subsidiary that employs the Grantee, the Administrator or their respective agents, to sell the Shares acquired under the Plan, no later than six months following the termination of the Grantee's employment or service or at some other time determined by the Company or the Administrator, and to repatriate the sale proceeds in such manner as may be designated by the Company or the Administrator.

Shares Must Remain With Company's Designated Broker. The Grantee agrees to hold the Shares received upon vesting of the Award Units with the Company's designated broker until the Shares are sold.

Administration. The Company shall not be liable for any costs, fees, lost interest or dividends or other losses the Grantee may incur or suffer resulting from the enforcement of the terms of this Appendix or otherwise from the Company's operation and enforcement of the Plan, the Agreement and the Award Unit in accordance with Chinese law including, without limitation, any applicable SAFE rules, regulations and requirements.

Terms and Conditions Applicable to Colombia

Securities Law Information. The shares of Common Stock subject to the Award Units are not and will not be registered in the Colombian registry of publicly traded securities (*Registro Nacional de Valores y Emisores*) and therefore the shares may not be offered to the public in Colombia. Nothing in this document should be construed as the making of a public offer of securities in Colombia.

Exchange Control Information. Investment and assets (such as Shares) held abroad must be registered with the Central Bank (Banco de la Republica) if the value the Grantee's aggregate investments and assets abroad (as of December 31st of the relevant fiscal year) equals or exceeds US\$500,000. In addition, when the Grantee sells or otherwise dispose of any Award Units acquired under the Plan, if the investment was registered with the Central Bank, the Grantee must cancel the registration no later than March 31st of the year following the year in which the Shares were sold. If the Grantee does not cancel the registration by the above-mentioned deadline, the Grantee will be subject to a fine of up to 200% of the value of the registered amount.

Terms and Conditions Applicable to Croatia

Cash Settlement. Notwithstanding any other provision in the Plan or the Agreement to the contrary, the Grantee's Award Unit may only be settled in cash.

Terms and Conditions Applicable to Czech Republic

Cash Settlement. Notwithstanding any other provision in the Plan or the Agreement to the contrary, the Grantee's Award Unit may only be settled in cash.

Terms and Conditions Applicable to Denmark

Treatment of Award Unit Upon Termination of Service. Notwithstanding any provisions in the Agreement to the contrary, unless the Grantee is a member of registered management who is not considered a salaried employee, the treatment of the Award Units upon the Grantee's termination of employment shall be governed by the Act on Stock Options in Employment Relations. However, if the provisions in the Agreement or the Plan governing the treatment of the Award Units upon a termination of employment are more favorable, then the provisions of the Agreement or the Plan will govern.

Terms and Conditions Applicable to Egypt

Exchange Control Information. If the Grantee transfers funds into or out of Egypt in connection with the Plan, Grantee is required to transfer the funds through a registered bank in Egypt.

Terms and Conditions Applicable to Finland

Tax Withholding. Notwithstanding anything in Article 7 of the Agreement or Section 13 of the Plan to the contrary, if the Grantee is a local national of Finland, any Tax-Related Items shall be withheld only in cash from the Grantee's regular salary/wages or other amounts payable to the Grantee in cash, or such other withholding methods as may be permitted under the Plan and allowed under local law.

Terms and Conditions Applicable to France

Use of English Language. Les parties reconnaissent avoir exigé la rédaction en anglais de la présente convention, ainsi que de tous documents exécutés, avis donnés et procédures judiciaires intentées, directement ou indirectement, relativement à ou suite à la présente convention.

Non-Qualified Awards. The Award Units are not intended to qualify for specific tax or social security treatment in France. The Company has decided not to provide terms and conditions of the grant in compliance with the French Commercial Code provisions on French qualified awards.

Terms and Conditions Applicable to Germany

Exchange Control Information. Cross-border payments in excess of €12,500 must be reported monthly to the State Central Bank. The Grantee is responsible for obtaining the appropriate form from the remitting bank and complying with the applicable reporting obligations.

Terms and Conditions Applicable to Guatemala

Extraordinary Item of Compensation. The Grantee understands and agrees that any additional revenues or income arising from the Award Units, their vesting and/or sale of the Shares the Grantee acquires pursuant to the Award Units, shall not constitute salary or benefit arising from any employment agreement, as such revenues or income are unrelated to such employment agreement.

Terms and Conditions Applicable to Hong Kong

Timing and Manner of Payment of Award Units. Award Units granted in Hong Kong shall be paid by the Company delivering to the Grantee a number of Shares equal to the number of Award Units that become non-forfeitable upon the date of payment and the Award Units shall not be paid in a lump sum cash payment, notwithstanding any discretion contained in the Plan or any provision in the Agreement.

Sale of Shares. If, for any reason, the Award Units vest and become non-forfeitable and Shares are issued to the Grantee within six months of the Date of Grant, the Grantee agrees that he or she will not dispose of any such Shares prior to the six-month anniversary of the Date of Grant.

Securities Law Information. The Award Units and any Shares to be issued pursuant to the Award Units are not a public offer of securities and are available only for employees of the Company or any of its Subsidiaries participating in the Plan. The contents of the Agreement, this Appendix and the Plan have not been reviewed by any regulatory authority in Hong Kong. The Grantee is advised to exercise caution in relation to the Award Unit. If the Grantee is in any doubt as to the contents of the Agreement, this Appendix or the Plan, the Grantee should obtain independent professional advice.

Nature of Scheme. The Company specifically intends that the Plan will not be an occupational retirement scheme for purposes of the Occupational Retirement Schemes Ordinance.

Terms and Conditions Applicable to Hungary

Cash Settlement. Notwithstanding any other provision in the Plan or the Agreement to the contrary, the Grantee's Award Unit may only be settled in cash.

Terms and Conditions Applicable to India

Exchange Control Information. The Grantee understands that he or she must repatriate to India any proceeds from the sale of Shares acquired under the Plan and any dividend equivalent payment within 90 days of receipt, and any cash dividends within 180 days of receipt. The Grantee will receive a foreign inward remittance certificate ("FIRC") from the bank where the Grantee deposits the foreign currency. The Grantee should maintain the FIRC as evidence of the repatriation of funds in the event the Reserve Bank of India or the Grantee's employer requests proof of repatriation.

Terms and Conditions Applicable to Indonesia

Exchange Control Information. If the Grantee remits funds (including proceeds from the sale of Shares) into Indonesia, the Indonesian bank through which the transaction is made will submit a report of the transaction to the Bank of Indonesia for statistical reporting purposes. For transactions of US\$10,000 or more, a more detailed description of the transaction must be included in the report and the Grantee may be required to provide information about the transaction (e.g., the relationship between the Grantee and the transferor of the funds, the source of the funds, etc.) to the bank in order for the bank to complete the report.

Terms and Conditions Applicable to Ireland

Director Notification Information. If the Grantee is a director, shadow director or secretary of an Irish Subsidiary or affiliate whose interests meet or exceed 1% of the Company's voting rights, pursuant to Section 53 of the Irish Company Act 1990, the Grantee must notify the Irish Subsidiary or affiliate in writing within five (5) business days of receiving or disposing of an interest in the Company (e.g., Award Units, Shares, etc.), or within five (5) business days of becoming aware of the event giving rise to the notification requirement, or within five (5) business days of becoming a director, shadow director or secretary if such an interest exists at that time. This notification requirement also applies with respect to the interests of a spouse or minor children, whose interests will be attributed to the director, shadow director or secretary.

Terms and Conditions Applicable to Italy

Exchange Control Information. Italian residents who, at any time during the fiscal year, hold foreign financial assets (such as cash, Shares) which may generate income taxable in Italy are required to report such assets on their annual tax returns or on a special form if no tax return is due. The same reporting duties apply to Italian residents who are beneficial owners of the foreign financial assets pursuant to Italian money laundering provisions, even if they do not directly hold the foreign asset abroad. The Grantee is advised to consult his or her personal legal advisor to ensure compliance with applicable reporting requirements.

Terms and Conditions Applicable to Japan

Foreign Asset/Account Reporting Notice. The Grantee will be required to report details of any assets held outside of Japan as of December 31 (including any Shares acquired under the Plan) to the extent such assets have a total net fair market value exceeding ¥50,000,000. Such report will be due by March 15 each year. The Grantee should consult with his or her personal tax advisor as to whether the reporting obligation applies to the Grantee and whether the Grantee will be required to report details of any outstanding Award Units, Shares or cash held by the Grantee in the report.

Terms and Conditions Applicable to Malaysia

Director Notification. If the Grantee is a director of a Malaysian Subsidiary or affiliate of the Company, the Grantee is subject to certain notification requirements under the Malaysian Companies Act. Among these requirements is an obligation to notify the Company's Malaysian Subsidiary or affiliate in writing when the Grantee receives or disposes of an interest (e.g., Award Units or Shares) in the Company or any related company. This notification must be made within 14 days of receiving or disposing of any interest in the Company or any related company.

Consent to Collection, Processing and Transfer of Personal Data. This provision replaces Section 9 of the Agreement in its entirety:

The Grantee hereby explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Grantee's personal data, as described in this Appendix and any other Award Unit grant materials by and among, as applicable, the Company and Subsidiaries for the exclusive purpose of implementing, administering and managing the Grantee's participation in the Plan.

The Grantee understands that the Company and Subsidiaries may hold certain personal information about the Grantee, including, but not limited to, the Grantee's name, home address and telephone number, date of birth, social insurance number or other identification number, salary, nationality, job title, any shares of stock or directorships held in the Company, details of all Award Units or any other entitlement to stock awarded, canceled, exercised, vested, unvested or outstanding in the Grantee's favor, for the exclusive purpose of implementing, administering and managing the Plan ("Data"). The Data is supplied by the Company and also by the Grantee through information collected in connection with the Agreement and the Plan.

Anda dengan ini secara eksplisit dan tanpa sebarang keraguan mengizinkan pengumpulan, penggunaan dan pemindahan, dalam bentuk elektronik atau lain-lain, data peribadi anda seperti yang diterangkan dalam Lampiran ini dan apa-apa bahan Opsyen yang lain oleh dan di antara, seperti yang berkenaan, Syarikat dan Ahli Gabungan untuk tujuan yang eksklusif bagi melaksanakan, mentadbir dan menguruskan penyertaan anda di dalam Pelan.

Anda memahami bahawa Syarikat dan Ahli Gabungan mungkin memegang maklumat peribadi tertentu tentang anda, termasuk, tetapi tidak terhad kepada, nama anda, alamat rumah dan nombor telefon, tarikh lahir, nombor insurans sosial atau nombor pengenalan lain, gaji, kewarganegaraan, jawatan, apa-apa syer saham Biasa atau jawatan pengarah yang dipegang dalam Syarikat, butir-butir semua Opsyen, atau apa-apa hak lain atas syer Biasa saham yang dianugerahkan, dibatalkan, dilaksanakan, terletak hak, tidak diletak hak ataupun yang belum dijelaskan bagi faedah anda, untuk tujuan eksklusif bagi melaksanakan, mentadbir dan menguruskan Pelan tersebut ("Data"). Data tersebut dibekalkan oleh Syarikat dan juga oleh anda berkenaan dengan Perjanjian dan Pelan.

The Grantee understands that Data will be transferred to the current stock plan service providers or a stock plan service provider as may be selected by the Company in the future, which is assisting the Company with the implementation, administration and management of the Plan. The Grantee understands that the recipients of the Data may be located in the United States or elsewhere, and that the recipients' country (e.g., the United States) may have different data privacy laws and protections than the Grantee's country. The Grantee understands that if the Grantee resides outside the United States, the Grantee may request a list with the names and addresses of any potential recipients of the Data by contacting the Grantee's local human resources representative at ECOLAB SDN BHD, Suite 12-01,12-02,12-03A, Level 12, The Pinnacle, Persiaran Lagoon, Bandar Sunway,46150 Petaling Jaya, Selangor MALAYSIA.. The Grantee authorizes the Company, the stock plan service provider and any other possible recipients which may assist the Company (presently or in the future) with implementing, administering and managing the Plan to receive, possess, use, retain and transfer the Data, in electronic or other form, for the purposes of implementing, administering and managing the Grantee's participation in the Plan, including any transfer of such Data as may be required to a broker, escrow agent or other third party with whom the stock received upon exercise of Award Units may be deposited. The Grantee understands that Data will be held only as long as is necessary to implement, administer and manage the Grantee's participation in the Plan. The Grantee understands that if the Grantee resides outside the United States, the Grantee may, at any time, view Data, request additional information about the storage and processing of Data, require any necessary amendments to Data, limit the processing of Data or refuse or withdraw the consents herein, in any case without cost, by contacting in writing the Grantee's local human resources representative. Further, the

Anda memahami bahawa Data ini akan dipindahkan kepada pembekal perkhidmatan pelan saham semasa atau pembekal perkhidmatan pelan saham yang mungkin dipilih oleh Syarikat pada masa depan, yang membantu Syarikat dengan pelaksanaan, pentadbiran dan pengurusan Pelan. Anda memahami bahawa penerima-penerima Data mungkin berada di Amerika Syarikat atau mana-mana tempat lain, dan bahawa negara penerima-penerima (contohnya, Amerika Syarikat) mungkin mempunyai undang-undang privasi data dan perlindungan yang berbeza daripada negara anda. Anda memahami bahawa sekiranya anda menetap di luar Amerika Syarikat, anda boleh meminta satu senarai yang mengandungi nama-nama dan alamat-alamat penerima-penerima Data yang berpotensi dengan menghubungi wakil sumber manusia tempatan anda ECOLAB SDN BHD, Suite 12-01,12-02,12-03A,Level 12, The Pinnacle, Persiaran Lagoon, Bandar Sunway,46150 Petaling Jaya, Selangor MALAYSIA. Anda memberi kuasa kepada Syarikat, pembekal perkhidmatan pelan saham dan mana-mana penerima-penerima kemungkinan lain yang mungkin akan membantu Syarikat (pada masa sekarang atau pada masa depan) dengan melaksanakan, mentadbir dan menguruskan Pelan untuk menerima, memiliki, menggunakan, mengekalkan dan memindahkan Data, dalam bentuk elektronik atau lain-lain, bagi tujuan melaksanakan, mentadbir dan menguruskan penyertaan anda di dalam Pelan, termasuk segala pemindahan Data tersebut sebagaimana yang dikehendaki kepada broker, agen eskrow atau pihak ketiga dengan siapa syer Biasa saham diterima semasa peletakhakan Opsyen mungkin didepositkan. Anda memahami bahawa Data hanya akan disimpan selagi ia adalah diperlukan untuk melaksanakan, mentadbir, dan menguruskan penyertaan anda dalam Pelan. Anda memahami bahawa sekiranya anda menetap di luar Amerika Syarikat, anda boleh, pada bila-bila masa, melihat Data, meminta maklumat tambahan mengenai penyimpanan dan pemrosesan Data, meminta bahawa pindaan-

Grantee understands that the Grantee is providing the consent herein on a purely voluntary basis. If the Grantee does not consent, or if the Grantee later seek to revoke consent, the Grantee's employment status or service and career with the Company will not be adversely affected; the only adverse consequence of refusing or withdrawing consent is that the Company may not be able to grant Award Units or other equity awards or administer or maintain such awards to the Grantee. Therefore, the Grantee understands that refusing or withdrawing consent may affect the Grantee's ability to participate in the Plan. For more information on the consequences of refusal to consent or withdrawal of consent, the Grantee understands that the Grantee may contact his or her local human resources representative.

Please take note that by electronically accepting this award agreement, the Grantee has confirmed that the Grantee explicitly, voluntarily and unambiguously consents to the collection, use and transfer of the Grantee's personal data in accordance with the terms in this notification. However, if for any reason the Grantee does not consent to the processing of the Grantee's personal data, the Grantee has the right to reject such consent by contacting the Grantee's local human resources representative at ECOLAB SDN BHD, Suite 12-01,12-02,12-03A, Level 12, The Pinnacle, Persiaran Lagoon, Bandar Sunway,46150 Petaling Jaya, Selangor MALAYSIA.

pindaan dilaksanakan ke atas Data, mengehadkan pemprosesan Data, atau menolak atau menarik balik persetujuan dalam ini, dalam mana-mana kes, tanpa kos, dengan menghubungi secara bertulis wakil sumber manusia tempatan. Selanjutnya, anda memahami bahawa anda memberikan persetujuan di sini secara sukarela semata-mata. Sekiranya anda tidak bersetuju, atau sekiranya anda kemudian membatalkan persetujuan anda, status pekerjaan atau perkhidmatan dan kerjaya anda dengan Syarikat tidak akan terjejas; satu-satunya akibat buruk sekiranya anda tidak bersetuju atau menarik balik persetujuan anda adalah bahawa Syarikat tidak akan dapat memberikan Opsyen atau anugerah ekuiti lain atau mentadbir atau mengekalkan anugerah-anugerah tersebut kepada anda. Oleh itu, anda memahami bahawa keengganan atau penarikan balik persetujuan anda boleh menjejaskan keupayaan anda untuk mengambil bahagian dalam Pelan. Untuk maklumat lebih lanjut mengenai akibat-akibat keengganan anda untuk memberikan keizinan atau penarikan balik keizinan, anda memahami bahawa anda boleh menghubungi wakil sumber manusia tempatan.

Sila ambil perhatian bahawa dengan menerima perjanjian anugerah ini secara elektronik, anda mengesahkan bahawa anda secara eksplisit, sukarela, dan tanpa sebarang keraguan bersetuju dengan pengumpulan, penggunaan, dan pemindahan data peribadi anda mengikut terma-terma dalam notis ini. Walaubagaimanapun, jika atas apa-apa sebab-sebab tertentu anda tidak bersetuju dengan pemprosesan data peribadi anda, anda mempunyai hak untuk menolak persetujuan anda dengan menghubungi wakil sumber manusia tempatan anda di ECOLAB SDN BHD, Suite 12-01,12-02,12-03A,Level 12, The Pinnacle, Persiaran Lagoon, Bandar Sunway,46150 Petaling Jaya, Selangor MALAYSIA.

Terms and Conditions Applicable to Mexico

Extraordinary Item of Compensation. The Grantee expressly recognizes and acknowledges that the Grantee's participation in the Plan is a result of the discretionary and unilateral decision of the Company, as well as the Grantee's free and voluntary decision to participate in the Plan in accord with the terms and conditions of the Plan, the Agreement and this Appendix. As such, the Grantee acknowledges and agrees that the Company may, in its sole discretion, amend and/or discontinue participation in the Plan at any time and without any liability. The value of the Award Units are an extraordinary item of compensation outside the scope of the Grantee's employment contract, if any. The Award Units are not part of the Grantee's regular or expected compensation for purposes of calculating any severance, resignation, redundancy, end of service payments, bonuses, long-service awards, pension or retirement benefits, or any similar payments, which are the exclusive obligations of the Company's local affiliate in Mexico that employs the Grantee.

Terms and Conditions Applicable to the Netherlands

Securities Law Information. The Grantee should be aware of Dutch insider-trading rules, which may impact the sale of Shares acquired at vesting of the Award Units. In particular, the Grantee may be prohibited from effectuating certain transactions involving Shares during the period in which the Grantee possesses "inside information" regarding the Company. By accepting the Award Units, the Grantee acknowledges having read and understood the Securities Law Information and further acknowledge that it is the Grantee's responsibility to comply with the following Dutch insider trading rules:

Under Article 5:56 of the Dutch Financial Supervision Act, anyone who has "inside information" related to the Company is prohibited from effectuating a transaction in securities in or from the Netherlands. "Inside information" is knowledge of a detail concerning the issuer to which the securities relate that is not public and which, if published, would reasonably be expected to affect the stock price, regardless of the development of the price. The insider could be any employee of the Company or a Subsidiary or affiliate in the Netherlands who has inside information as described herein.

Waiver of Termination Rights. As a condition to the grant of the Award Units, the Grantee hereby waives any and all rights to compensation or damages as a result of a Termination of Service for any reason whatsoever, insofar as those rights result or may result from (a) the loss or diminution in value of such rights or entitlements under the Plan, or (b) the Grantee ceasing to have rights under, or ceasing to be entitled to any Award Units under the Plan as a result of such termination.

Terms and Conditions Applicable to the New Zealand

Securities Law Information. Warning: This is an offer of rights to receive shares of Common Stock upon vesting of the Award Units subject to the terms of the Plan and the Agreement. Award Units give the Grantee a stake in the ownership of the Company. The Grantee may receive a return if dividends are paid on the Shares.

If the Company runs into financial difficulties and is wound up, the Grantee will be paid only after all creditors and holders of preferred shares have been paid. The Grantee may lose some or all of the investment.

New Zealand law normally requires people who offer financial products to give information to investors before they invest. This information is designed to help investors to make an informed decision.

The usual rules do not apply to this offer because it is made under an employee share purchase scheme. As a result, the Grantee may not be given all the information usually required. The Grantee will also have fewer other legal protections for this investment.

The Grantee should ask questions, read all documents carefully, and seek independent financial advice before committing to participate in the Plan.

In addition, the Grantee is hereby notified that the documents listed below are available for review at the web addresses listed below:

1. Ecolab Inc.'s most recent Annual Report (Form 10-K) - <http://investor.ecolab.com/earnings-center/sec-filings>
2. Ecolab Inc.'s most recent published financial statements - <http://investor.ecolab.com/earnings-center/sec-filings>
3. The Plan and the Agreement - www.etrade.com/stockplans

The Grantee acknowledges that the Grantee may have a copy of the above documents sent to the Grantee, without fee, on written request being mailed to Investor Relations at Ecolab Inc., 1 Ecolab Place, Saint Paul, Minnesota, 55102, U.S.A. The telephone number at the executive offices is 651-250-2809.

As noted above, the Grantee is advised to carefully read the materials provided before making a decision whether to participate in the Plan. The Grantee is also encouraged to contact the Grantee's personal tax advisor for specific information concerning the Grantee's personal tax situation with regard to Plan participation.

Terms and Conditions Applicable to Pakistan

Cash Settlement. Notwithstanding any other provision in the Plan or the Agreement to the contrary, the Grantee's Award Unit may only be settled in cash.

Terms and Conditions Applicable to Panama

Securities Law Notice. Neither the Award Units nor the Shares that the Grantee may acquire under the Plan constitute a public offering of securities, as they are available only to eligible employees of the Company, its affiliates and its Subsidiaries.

Terms and Conditions Applicable to Philippines

Cash Settlement. Notwithstanding any other provision in the Plan or the Agreement to the contrary, the Grantee's Award Unit may only be settled in cash.

Terms and Conditions Applicable to Poland

Foreign Asset/Account Reporting Information. If Grantee maintains bank or brokerage accounts holding cash and foreign securities (including shares of Common Stock) outside of Poland, Grantee will be required to report information to the National Bank of Poland on transactions and balances in such accounts if the value of such cash and securities exceeds a certain threshold. If required, such reports must be filed on a quarterly basis on special forms available on the website of the National Bank of Poland.

Exchange Control Information. If the Grantee holds foreign securities (including shares of Common Stock) and maintains accounts abroad, the Grantee may be required to file certain reports with the National Bank of Poland. Specifically, if the value of securities and cash (when combined with all other assets held abroad) held in such foreign accounts exceeds PLN 7 million, the Grantee must file reports on the transactions and balances of the accounts on a quarterly basis. Further, any fund transfers into or out of Poland in excess of €15,000 must be effected through a bank in Poland. Polish residents are required to store all documents related to foreign exchange transactions for a period of five (5) years.

Terms and Conditions Applicable to Russia

No Offering of Securities in Russia. The grant of the Award Units is not intended to be an offering of securities within the territory of the Russian Federation, and the Grantee acknowledges and understands that the Grantee will be unable to make any subsequent sale of the Shares acquired pursuant to the Award Units in the Russian Federation.

Cash Payments to a Russian Bank Account. If the Grantee is a Russian citizen, any sales proceeds resulting from the sales of shares acquired upon settlement of the Award Unit(s) may only be delivered to a bank account that the Grantee maintains with an authorized bank in Russia.

Foreign Asset/Account Reporting Information. Russian residents will be required to notify the Russian tax authorities within one month of opening or closing a foreign bank account or of changing any account details. Russian residents are also required to file with the Russian tax authorities reports of the transactions in their foreign bank accounts. Grantee should consult with his or her personal tax advisor for additional information about these reporting obligations.

Anti-Corruption Notification. Anti-corruption laws prohibit certain public servants, their spouses and their dependent children from owning any foreign-source financial instruments (e.g., shares of foreign companies such as the Company). Accordingly, if the Grantee is covered by these laws, the Grantee should inform the Company because the Grantee should not hold Shares that may be acquired under the Plan.

Terms and Conditions Applicable to Saudi Arabia

Securities Law Notification. This document may not be distributed in the Kingdom except to such persons as are permitted under the Rules on the Offer of Securities and Continuing Obligations issued by the Capital Market Authority. The Capital Market Authority does not make any representation as to the accuracy or completeness of this document, and expressly disclaims any liability whatsoever for any loss arising from, or incurred in reliance upon, any part of this document. Prospective purchasers of the securities offered hereby should conduct their own due diligence on the accuracy of the information relating to the securities. The Grantee understands that if the Grantee does not understand the contents of this document, the Grantee should consult an authorized financial advisor.

Terms and Conditions Applicable to Singapore

Director Notification Information. If the Grantee is a director, associate director or shadow director of a Singapore Subsidiary, the Grantee is subject to certain notification requirements under the Singapore Companies Act, regardless of whether the Grantee is a Singapore resident or employed in Singapore. Among these requirements is an obligation to notify the Singapore Subsidiary of an interest (e.g., Award Units, Shares) in the Company or any related companies within two business days of (i) acquiring or disposing of such interest, (ii) any change in a previously disclosed interest (e.g., vesting of Award Units, sale of Shares), or (iii) becoming a director, associate director or shadow director if such an interest exists at the time.. The Grantee may contact the Company to obtain a copy of the notification form.

Securities Law Information. The grant of the Award Units is being made pursuant to the “Qualifying Person” exemption” under section 273(1)(f) of the Securities and Futures Act (Chapter 289, 2006 Ed.) (“SFA”). The Plan has not been lodged or registered as a prospectus with the Monetary Authority of Singapore. The Grantee should note that the Award Units are subject to section 257 of the SFA and the Grantee will not be able to make (i) any subsequent sale of the Shares in Singapore or (ii) any offer of such subsequent sale of the Shares subject to the Award Units in Singapore, unless such sale or offer is made pursuant to the exemptions under Part XIII Division 1 Subdivision (4) (other than section 280) of the SFA.

Terms and Conditions Applicable to South Africa

Exchange Control Obligations. The Grantee is solely responsible for complying with applicable exchange control regulations and rulings (the “Exchange Control Regulations”) in South Africa. As the Exchange Control Regulations change frequently and without notice, the Grantee should consult his or her legal advisor prior to the acquisition or sale of Shares under the Plan to ensure compliance with current Exchange Control Regulations. Neither the Company nor any of its Subsidiaries or affiliates will be liable for any fines or penalties resulting from the Grantee's failure to comply with applicable laws.

Securities Law Notice. Neither the Award Units nor the underlying Shares shall be publicly offered or listed on any stock exchange in South Africa. The offer is intended to be private pursuant to Section 96 of the Companies Act and is not subject to the supervision of any South African governmental authority. Pursuant to Section 96 of the Companies Act, the offer must be finalized on or before the 60th day following the grant date. If you do not want to accept the Award Units, you are required to decline the offer no later than the 60th day following the grant date. If you do not reject the offer on or before the 60th day following the grant date, you will be deemed to have accepted the Award Units.

Terms and Conditions Applicable to South Korea

Consent to Collection/Processing/Transfer of Personal Data. The following provision shall replace Section 9 of the Agreement in its entirety:

Pursuant to applicable personal data protection laws, the Company hereby notifies the Grantee of the following in relation to the Grantee's personal data and the collection, processing and transfer of such data in relation to the Company's grant of this Award Unit and the Grantee's participation in the Plan. The collection, processing and transfer of the Grantee's personal data is necessary for the Company's administration of the Plan and the Grantee's participation in the Plan, and although the Grantee have the right to deny or object to the collection, processing and transfer of personal data, the Grantee's denial and/or objection to the collection, processing and transfer of personal data may affect the Grantee's participation in the Plan. As such, the Grantee voluntarily acknowledges and consents (where required under applicable law) to the collection, use, processing and transfer of personal data as described herein. The Company shall retain and use the Grantee's personal data until the purpose of the collection and use of the Grantee's personal data is accomplished and shall promptly destroy the Grantee's personal data thereafter.

The Company holds certain personal information about the Grantee, including the Grantee's name, home address and telephone number, date of birth, social security number (resident registration number) or other employee identification number, salary, nationality, job title, any shares or directorships held in the Company, details of all options, units or any other entitlement to shares awarded, canceled, purchased, vested, unvested or outstanding in the Grantee's favor, for the purpose of managing and administering the Plan ("Data"). The Data may be provided by the Grantee or collected, where lawful, from third parties, and the Company will process the Data for the exclusive purpose of implementing, administering and managing the Grantee's participation in the Plan. The Data processing will take place through electronic and non-electronic means according to logics and procedures strictly correlated to the purposes for which Data are collected and with confidentiality and security provisions as set forth by applicable laws and regulations in the Grantee's country of residence (and country of employment, if different). Data processing operations will be performed minimizing the use of personal and identification data when such operations are unnecessary for the processing purposes sought. Data will be accessible within the Company's organization only by those persons requiring access for purposes of the implementation, administration and operation of the Plan and for the Grantee's participation in the Plan.

The Company will transfer Data internally as necessary for the purpose of implementation, administration and management of the Grantee's participation in the Plan, and the Company may further transfer Data to any third parties assisting the Company in the implementation, administration and management of the Plan. The third party recipients of Data may be any affiliates of the Company and / or a third-party stock plan administrator or any successor or any other third party that the Company or third party stock plan administrator (or its successor) may engage to assist with the implementation, administration and management of the Plan from time to time. These recipients may be located in the European Economic Area, or elsewhere throughout the world, such as the United States. The Grantee hereby authorizes (where required under applicable law) them to receive, possess, use, retain and transfer the Data, in electronic or other form, for purposes of implementing, administering and managing the Grantee's participation in the Plan, including any requisite transfer of such Data as may be required for the administration of the Plan and/or the subsequent holding of shares on the Grantee's behalf to a broker or other third party with whom the Grantee may elect to deposit any shares acquired pursuant to the Plan. Such third parties to which the Company will transfer the Grantee's personal data shall retain and use the Grantee's personal data until the purpose of the collection and use of the Grantee's personal data is accomplished and shall promptly destroy the Grantee's personal data thereafter. The Company and any third party recipient of the Data will use, process and store the Data only to the extent they are necessary for the purposes described above.

The Grantee may, at any time, exercise the Grantee's rights provided under applicable personal data protection laws, which may include the right to (a) obtain confirmation as to the existence of the Data, (b) verify the content, origin and accuracy of the Data, (c) request the integration, update, amendment, deletion, or blockage (for breach of applicable laws) of the Data, (d) to oppose, for legal reasons, the collection, processing or transfer of the Data which is not necessary or required for the implementation, administration and/or operation of the Plan and the Grantee's participation in the Plan, and (e) withdraw the Grantee's consent to the collection, processing or transfer of Data as provided hereunder (in which case, the Grantee's Award Unit will be null and void). The Grantee may seek to exercise these rights by contacting the Grantee's local Human Resources manager or the Company's stock plan administrator.

BY ELECTRONICALLY ACCEPTING THIS AGREEMENT AND CLICKING "ACCEPT":

- 1) I AGREE TO THE COLLECTION AND USE OF MY PERSONAL DATA.
- 2) I AGREE TO THE PROVISION OF MY PERSONAL DATA TO A THIRD PARTY AND TRANSFER OF MY PERSONAL DATA OVERSEAS.

I AGREE TO THE PROCESSING OF MY UNIQUE IDENTIFYING INFORMATION (RESIDENT REGISTRATION NUMBER).

Foreign Asset / Account Reporting Information. Korean residents must declare all foreign financial accounts (e.g., non-Korean bank accounts, brokerage accounts) based in foreign countries to the Korean tax authority and file a report with respect to such accounts if the monthly balance of such accounts exceeds KRW 500 million (or an equivalent amount in foreign currency) on any month-end date during a calendar year. The Grantee should consult with his or her personal tax advisor for additional information about this reporting obligation.

Terms and Conditions Applicable to Spain

Nature of Award. In accepting the grant of Award Units, the Grantee acknowledges that he or she consents to participation in the Plan and has received a copy of the Plan.

The Grantee understands that the Company has unilaterally, gratuitously and discretely decided to grant Award Units under the Plan to individuals who may be employees of the Company or its Subsidiaries throughout the world. The decision is a limited decision that is entered into upon the express assumption and condition that any grant will not economically or otherwise bind the Company or any of its Subsidiaries on an ongoing basis. Consequently, the Grantee understands that the Award Units are granted on the assumption and condition that the Award Units and the Shares acquired upon lapse of the restrictions relating to the Award Units shall not become a part of any employment contract (either with the Company or any of its Subsidiaries) and shall not be considered a mandatory benefit, salary for any purposes (including severance compensation) or any other right whatsoever. In addition, the Grantee understands that this grant would not be made to the Grantee but for the assumptions and conditions referred to above; thus, the Grantee acknowledges and freely accepts that should any or all of the assumptions be mistaken or should any of the conditions not be met for any reason, then any grant of Award Units shall be null and void.

The Grantee understands and agrees that, as a condition of the grant of the Award Units, the termination of the Grantee's continuous status as an employee for any reason (including the reasons listed below) will automatically result in the loss of the Award Units to the extent the Award Units have not vested as of date the Grantee is no longer actively employed. In particular, the Grantee understands and agrees that any unvested Award Units as of the date the Grantee is no longer actively employed will be forfeited without entitlement to the underlying Shares or to any amount of indemnification in the event of the termination of the Grantee's continuous status as an employee by reason of, but not limited to, resignation, retirement, disciplinary dismissal adjudged to be with cause, disciplinary dismissal adjudged or recognized to be without cause, individual or collective dismissal on objective grounds, whether adjudged or recognized to be with or without cause, material modification of the terms of employment under Article 41 of the Workers' Statute, relocation under Article 40 of the Workers' Statute, Article 50 of the Workers' Statute, unilateral withdrawal by the employing Subsidiary and under Article 10.3 of the Royal Decree 1382/1985. The Grantee acknowledges that he or she has read and specifically accepts the conditions referred to in this Appendix.

Securities Law Information. No "offer of securities to the public," within the meaning of Spanish law, has taken place or will take place in the Spanish territory in connection with the Plan or an Award Unit. The Plan, the Agreement (including this Appendix) and any other documents evidencing the grant of the Award Units have not been, nor will they be, registered with the *Comisión Nacional del Mercado de Valores* (the Spanish securities regulator), and none of those documents constitutes a public offering prospectus.

Exchange Control Information. The acquisition, ownership and sale of Shares under the Plan must be declared for statistical purposes to the *Spanish Dirección General de Comercio e Inversiones* (the "DGCI"), the Bureau for Commerce and Investments, which is a department of the Ministry of Economy and Competitiveness. Generally, the declaration must be made in January for Shares acquired or sold during (or owned as of December 31 of) the prior year. The Grantee may also be required to declare any securities accounts (including brokerage accounts held abroad) depending on the value of the transactions during the relevant year or the balances in such accounts as of December 31 of the relevant year.

When receiving foreign currency payments derived from the ownership of Shares (*i.e.*, dividends or sale proceeds) exceeding €50,000, the Grantee must inform the financial institution receiving the payment of the basis upon which such payment is made. The Grantee will need to provide the institution with the following information: (i) the Grantee's name, address, and tax identification number; (ii) the name and corporate domicile of the Company; (iii) the amount of the payment; the currency used; (iv) the country of origin; (v) the reasons for the payment; and (vi) further information that may be required. After such foreign currency payments are initially reported, the reporting obligation will only apply for subsequent years if the value of any previously-reported rights or assets increases by more than €20,000. If reporting is required, the Grantee must file the report on form 720 by March 31 following the end of the relevant year.

The Grantee is solely responsible for complying with any exchange control or other reporting requirement that may apply to the Grantee as a result of participation in the Plan, the acquisition and/or sale of the Shares and/or the transfer of funds in connection with the award. The Grantee should consult his or her legal advisor to confirm the current reporting requirements when he or she acquires Shares, sells Shares and/or transfers any funds related to the Plan to Spain.

Terms and Conditions Applicable to Sweden

Tax Withholding. Notwithstanding anything in Article 7 of the Agreement or Section 13 of the Plan to the contrary, if the Grantee is a tax resident of Sweden, any Tax-Related Items shall be withheld only in cash from the Grantee's regular salary/wages or other amounts payable to the Grantee in cash, or such other withholding methods as may be permitted under the Plan and allowed under local law.

Terms and Conditions Applicable to Switzerland

Securities Law Information. The Award Units are not intended to be publicly offered in or from Switzerland. Neither this document nor any other materials relating to the Plan constitutes a prospectus as such term is understood pursuant to article 652a of the Swiss Code of Obligations and neither this document nor any other materials relating to the Plan may be publicly distributed nor otherwise made publicly available in Switzerland.

Terms and Conditions Applicable to Taiwan

Data Privacy. In addition to the consent to the collection, use and transfer of Data as described in Section 9 of the Agreement, upon request of the Company or an employing Subsidiary, the Grantee agrees to provide any other executed data privacy consent form (or any other agreements or consents that may be required by the Company or the employing Subsidiary) should the Company and/or the employing Subsidiary deem such agreement or consent necessary under applicable data privacy laws, either now or in the future. The Grantee understands that he or she will not be able to participate in the Plan if he or she fails to execute any such consent or agreement.

Exchange Control Information. The Grantee may acquire and remit foreign currency (including proceeds from the sale of Shares) up to US\$5,000,000 per year without justification. If the transaction amount is US\$500,000 or more in a single transaction, the Grantee must submit a Foreign Exchange Transaction Form. If the transaction amount is US\$500,000 or more in a single transaction, the Grantee must also provide supporting documentation to the satisfaction of the remitting bank.

Terms and Conditions Applicable to Thailand

Exchange Control Information. The Grantee must repatriate the proceeds from the sale of Shares and any cash dividends received in relation to the Shares to Thailand immediately upon receipt and to convert the funds to Thai Baht or deposit the proceeds in a foreign currency deposit account maintained by a bank in Thailand within 360 days of remitting the proceeds to Thailand. If the amount of the proceeds is equal to or greater than US\$50,000, the Grantee must specifically report the inward remittance to the Bank of Thailand on a Foreign Exchange Transaction Form. If the Grantee does not comply with this obligation, the Grantee may be subject to penalties assessed by the Bank of Thailand. Because exchange control regulations change frequently and without notice, the Grantee should consult a legal advisor before selling Shares to ensure compliance with current regulations. It is the Grantee's responsibility to comply with exchange control laws in Thailand, and neither the Company nor the Grantee's employer will be liable for any fines or penalties resulting from the Grantee's failure to comply with applicable laws.

Terms and Conditions Applicable to Turkey

Securities Law Notice. Under Turkish law, Grantee is not permitted to sell any shares of Common Stock acquired under the Plan in Turkey. The shares are currently traded on the New York Stock Exchange, which is located outside of Turkey, under the ticker symbol "ECL" and the shares may be sold through this exchange.

Financial Intermediary Obligation. Grantee acknowledges that any activity related to investments in foreign securities (e.g., the sale of shares of Common Stock) should be conducted through a bank or financial intermediary institution licensed by the Turkey Capital Markets Board and should be reported to the Turkish Capital Markets Board. Grantee is solely responsible for complying with this requirement and should consult with a personal legal advisor for further information regarding any obligations in this respect.

Terms and Conditions Applicable to the United Kingdom

Tax Loan. If payment or withholding of the income tax due in connection with the Award Units is not made within ninety (90) days of the end of the U.K. tax year in which the income tax liability arises or such other period specified in Section 222(1)(c) of the U.K. Income Tax (Earnings and Pensions) Act 2003 (the "Due Date"), the amount of any uncollected income tax shall constitute a loan owed by the Grantee to the employer, effective as of the Due Date. The Grantee agrees that the loan will bear interest at the then-current official rate of Her Majesty's Revenue & Customs ("HMRC"), it shall be immediately due and repayable, and the Company or the employer may recover it at any time thereafter by any of the means referred to in the Agreement, or in the sole discretion of the Company. Notwithstanding the foregoing, if the Grantee is a director or executive officer of the Company (within the meaning of Section 13(k) of the U.S. Securities and Exchange Act of 1934, as amended), he or she shall not be eligible for a loan from the Company to cover the income tax liability. In the event that the Grantee is a director or executive officer and the income tax is not collected from or paid by him or her by the Due Date, the amount of any uncollected income tax may constitute a benefit to the Grantee on which additional income tax and national insurance contributions ("NICs") may be payable. The Grantee will be responsible for reporting any income tax due on this additional benefit directly to HMRC under the self-assessment regime and for paying the Company or the employer (as appropriate) for the value of any employee NICs due on this additional benefit which may be collected from Grantee by the Company or the Subsidiary by any of the means referred to in the Agreement.

Exclusion of Claim. The Grantee acknowledges and agrees that the Grantee will have no entitlement to compensation or damages in consequence of the termination of the Grantee's employment with the Company or its Subsidiaries or affiliates for any reason whatsoever and whether or not in breach of contract, insofar as such entitlement arises or may arise from the Grantee ceasing to have rights under or to be entitled to the Award Units as a result of such termination of employment (whether the termination is in breach of contract or otherwise), or from the loss or diminution in value of the Award Units. Upon the grant of Award Units, the Grantee shall be deemed irrevocably to have waived any such entitlement.

Terms and Conditions Applicable to Venezuela

Securities Law Notice. The Award Units granted under the Plan and the Shares issued under the Plan are offered as a personal, private, exclusive transaction and are not subject to Venezuelan government securities regulations.

Exchange Control Information. Exchange control restrictions may limit the ability to vest in the Award Units or to remit funds into Venezuela following the sale of Shares acquired under the Plan. The Company reserves the right to further restrict the settlement of the Award Units or to amend or cancel the Award Units at any time to comply with the applicable exchange control laws in Venezuela. However, ultimately, the Grantee is responsible for complying with exchange control laws in Venezuela and the Company, the Grantee and any other Subsidiary or affiliate will not be liable for any fines or penalties resulting from the Grantee's failure to comply with applicable laws. Because exchange control laws and regulations change frequently and without notice, the Grantee should consult with his or her personal legal advisor before accepting the Award Units to ensure compliance with current regulations.

SUBSIDIARIES OF ECOLAB INC.

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
NLC PROCESS AND WATER SERVICES SARL	Algeria
Ecolab (Antigua) Ltd.	Antigua & Barbuda
Anios America S.A.	Argentina
ChampionX Argentina S.R.L.	Argentina
Ecolab Argentina S.R.L.	Argentina
Ecolab Services Argentina S.R.L.	Argentina
Ecolab (Aruba) N.V.	Aruba
ChampionX Australia Pty Ltd	Australia
Ecolab (Fiji) Pty Limited	Australia
Ecolab AU2 Pty Ltd	Australia
Ecolab Pty Ltd.	Australia
Gallay Medical & Scientific Pty Ltd	Australia
GallayTrac Pty. Ltd.	Australia
Ecolab AT 2 GmbH	Austria
Ecolab GmbH	Austria
NALCO HOLDINGS G.m.b.H.	Austria
NALCO OSTERREICH Ges m.b.H.	Austria
Nalco Azerbaijan LLC	Azerbaijan
Ecolab Limited	Bahamas
Ecolab Bahrain S.P.C.	Bahrain
Ecolab (Barbados) Limited	Barbados
Ecolab B.V.B.A./S.P.R.L.	Belgium
Ecolab Production Belgium B.V.B.A.	Belgium
Kay BVBA	Belgium
NALCO BELGIUM BVBA	Belgium
Ecolab BM 1 Limited	Bermuda
Champion Technologies Do Brasil Servicos E Produtos Quimicos Ltda.	Brazil
Ecolab Quimica Ltda.	Brazil
Endoclear Equipamentos Médicos Hospitalares Ltda.	Brazil
Nalco (BN) SDN BHD	Brunei Darussalam
Ecolab EOOD	Bulgaria
2208331 Alberta ULC	Canada
Bioquell Technology Canada Ltd.	Canada
ChampionX Canada ULC	Canada
ChampionX Holdings 1 ULC	Canada
ChampionX Holdings 2 ULC	Canada
ChampionX Ultrafab ULC	Canada
Ecolab CDN 2 Co.	Canada

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
Ecolab CDN 4 ULC	Canada
Ecolab Co.	Canada
Les Produits Chimiques ERPAC Inc.	Canada
Nalco Canada ULC	Canada
Ecolab S.A.	Chile
NALCO INDUSTRIAL SERVICES CHILE LIMITADA	Chile
Bioquell Technology (Shenzhen) Ltd.	China
Ecolab (China) Investment Co., Ltd	China
Ecolab (GZ) Chemicals Limited	China
Ecolab (Taicang) Technology Co., Ltd.	China
Ecolab Chemicals Limited	China
Guangzhou Green Harbour Environmental Operation Ltd.	China
Jianghai Environmental Protection Co., Ltd.	China
Nalco (China) Environmental Solution Co. Ltd.	China
NALCO (SHANGHAI) TRADING CO. LTD.	China
NALCO INDUSTRIAL SERVICES (NANJING) CO., LTD.	China
NALCO INDUSTRIAL SERVICES (SUZHOU) CO., LTD.	China
Soluscope International Trading (Shanghai) Co., Ltd.	China
ChampionX de Colombia Ltda.	Colombia
Ecolab Colombia S. A.	Colombia
Ecolab SRL	Costa Rica
Ecolab d.o.o.	Croatia
Ecolab s.r.o.	Czech Republic
Bioquell Inc.	Delaware
CALGON LLC	Delaware
ChampionX EG Holdings LLC	Delaware
ChampionX Holding Inc.	Delaware
ChampionX LLC	Delaware
ChampionX Middle East Holdings, Inc.	Delaware
ChampionX Texas Leasing LLC	Delaware
ChampionX U.S. 3 Inc.	Delaware
ChampionX U.S. 4 LLC	Delaware
ChampionX U.S. 5 LLC	Delaware
ChampionX USA Inc.	Delaware
Chamtech, L.L.C.	Delaware
Chemstaff, Inc.	Delaware
Corexit Environmental Solutions LLC	Delaware
E&M Bio-Chemicals, LLC	Delaware
Ecolab AP Holdings LLC	Delaware
Ecolab Holdings (Europe) LLC	Delaware
Ecolab Holdings Inc.	Delaware

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
Ecolab Israel Holdings LLC	Delaware
Ecolab Lux Partner LLC	Delaware
Ecolab Manufacturing Inc.	Delaware
Ecolab MT Holdings LLC	Delaware
Ecolab Production LLC	Delaware
Ecolab U.S. 2 Inc.	Delaware
Ecolab U.S. 4 LLC	Delaware
Ecolab U.S. 6 LLC	Delaware
Ecolab U.S. 7 LLC	Delaware
Ecolab US 1 GP	Delaware
Ecolab USA Inc.	Delaware
Legacy Fabrication (Oman) Holdings, LLC	Delaware
Legacy Fabrication LLC	Delaware
Lobster Ink US, Inc.	Delaware
Microtek Medical Inc.	Delaware
NALCO CHINA HOLDINGS LLC	Delaware
Nalco Company LLC ⁽¹⁾	Delaware
Nalco Contract Operations, LLC	Delaware
NALCO DELAWARE COMPANY	Delaware
NALCO GLOBAL HOLDINGS LLC	Delaware
NALCO HOLDING COMPANY	Delaware
NALCO INDUSTRIAL OUTSOURCING COMPANY	Delaware
NALCO INTERNATIONAL HOLDINGS LLC	Delaware
Nalco Production LLC	Delaware
NALCO PWS, INC.	Delaware
NALCO TWO, INC.	Delaware
NALCO U.S. HOLDINGS LLC	Delaware
Nalco US 1 LLC	Delaware
Nalco Water Pretreatment Solutions, LLC	Delaware
NALCO WORLDWIDE HOLDINGS LLC	Delaware
NALTECH, INC.	Delaware
ONES WEST AFRICA LLC	Delaware
Quantum Technical Services, LLC	Delaware
Wabasha Leasing LLC	Delaware
Ecolab ApS	Denmark
NALCO DANMARK APS	Denmark
Microtek Dominicana S.A.	Dominican Republic
Champion Technologies Del Ecuador CIA LTDA. CHAMPIONTECH	Ecuador
Ecolab Ecuador	Ecuador

⁽¹⁾This subsidiary also conducts business under the assumed names of Cascade Water Services, Inc. and NALCO Water, An Ecolab Company.

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
NALCO EGYPT TRADING	Egypt
NALCO EGYPT, LTD.	Egypt
Ecolab, S.A. de C.V.	El Salvador
ChampionX Equatorial Guinea, S.A.R.L.	Equatorial Guinea
NALCO FINLAND MANUFACTURING OY	Finland
NALCO FINLAND OY	Finland
Oy Ecolab AB	Finland
Anios Diffusion SAS	France
Anios Distribution SAS	France
Anios Manufacturing SAS	France
Bioquell Holding SAS	France
Bioquell SAS	France
DMD	France
Ecolab FR 1 SAS	France
Ecolab FR 4 SAS	France
ECOLAB PEST FRANCE SAS	France
Ecolab Production France SAS	France
Ecolab SAS	France
Ecolab SNC	France
Hydenet SAS	France
Laboratoires Anios	France
NALCO FRANCE	France
NALCO FRANCE SNC	France
Soluscope SAS	France
ChampionX Gabon Sarl	Gabon
Microtek Medical Holdings Inc.	Georgia
Bioquell GmbH	Germany
Ecolab DE 1 GmbH	Germany
Ecolab Deutschland GmbH	Germany
Ecolab Engineering GmbH	Germany
Ecolab Export GmbH	Germany
Ecolab Pest Deutschland GmbH	Germany
NALCO DEUTSCHLAND GMBH	Germany
NALCO DEUTSCHLAND MANUFACTURING GMBH UND CO. KG	Germany
Nalco Grundbesitz GmbH & Co. KG	Germany
NALCO MANUFACTURING BETEILIGUNGS GMBH	Germany
Nalco Real Estate GmbH	Germany
ChampionX Oilfield Solutions Ghana Limited	Ghana
NALCO ENERGY SERVICES (GHANA) LIMITED	Ghana
Ecolab A.E.B.E.	Greece
Ecolab (Guam) LLC	Guam

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
Ecolab, Sociedad Anonima	Guatemala
ChampionX Guyana Inc.	Guyana
Quimicas Ecolab S.A. de C.V.	Honduras
Ecolab HK 1 Limited	Hong Kong
Ecolab HK 2 Limited	Hong Kong
Ecolab Limited	Hong Kong
Ecolab Name Holding Limited	Hong Kong
Ecolab Water Holding Limited	Hong Kong
Green Harbour Mainland Holdings Ltd	Hong Kong
NALCO HONG KONG LIMITED	Hong Kong
Ecolab Global Business Services LLC	Hungary
Ecolab Hygiene Kft.	Hungary
Ecolab Food Safety & Hygiene Solutions Private Limited	India
Nalco Water India Limited	India
P.T. Champion Kurnia Djaja Technologies	Indonesia
PT Ecolab International Indonesia	Indonesia
PT Ecolab Technologies and Services	Indonesia
PT Nalco Champion Indonesia	Indonesia
Bioquell Global Logistics (Ireland) Ltd.	Ireland
Ecolab (Holdings) Limited	Ireland
Ecolab Finance Company Designated Activity Company	Ireland
Ecolab IE 1 Designated Activity Company	Ireland
Ecolab Limited	Ireland
Kilco Chemicals (Ireland) Designated Activity Company	Ireland
Ecolab JVZ Limited	Israel
NALCO ISRAEL INDUSTRIAL SERVICES LTD	Israel
Ecolab Holding Italy S.r.l.	Italy
Ecolab Production Italy Srl	Italy
Ecolab Srl	Italy
Immobiliare R.E.O.P.A. SRL	Italy
Microtek Italy S.R.L.	Italy
NALCO ITALIANA HOLDINGS S.R.L.	Italy
NALCO ITALIANA MANUFACTURING S.R.L.	Italy
NALCO ITALIANA Srl	Italy
Nuova Farmec S.r.l.	Italy
Ecolab Limited	Jamaica
Ecolab G.K.	Japan
KATAYAMA NALCO INC.	Japan
Nalco Japan G.K.	Japan
CHAMPIONX GULF LIMITED	Jersey
Ecolab East Africa (Kenya) Limited	Kenya

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
Ecolab Korea Ltd.	Korea, Republic of
NALCO KOREA LIMITED	Korea, Republic of
Ecolab, SIA	Latvia
Nalco Libya	Libya
Ecolab LUX & Co Holdings S.C.A.	Luxembourg
Ecolab LUX 1 Sarl	Luxembourg
Ecolab Lux 10 Sarl	Luxembourg
Ecolab Lux 11 Sarl	Luxembourg
Ecolab Lux 12 Sarl	Luxembourg
Ecolab Lux 13 Sarl	Luxembourg
Ecolab Lux 14 Sarl	Luxembourg
Ecolab Lux 15 Sarl	Luxembourg
Ecolab LUX 2 Sarl	Luxembourg
Ecolab LUX 3 Sarl	Luxembourg
Ecolab LUX 4 Sarl	Luxembourg
Ecolab LUX 7 Sarl	Luxembourg
Ecolab Lux 9 S.a.r.l.	Luxembourg
Ecolab LUX Sarl	Luxembourg
NALCO LUXEMBOURG HOLDINGS SARL	Luxembourg
Nalco Worldwide Holdings S.a.r.l./B.V.	Luxembourg
Ecolab-Importacao E. Exportacao Limitada	Macau
Ecolab Sdn Bhd	Malaysia
NALCO INDUSTRIAL SERVICES MALAYSIA SDN. BHD	Malaysia
Ecolab MT Limited	Malta
Microtek Medical Malta Holding Limited	Malta
Microtek Medical Malta Limited	Malta
Champion Technologies Limited	Mauritius
Lobster Ink Ltd. (Mauritius)	Mauritius
Abednego de Mexico S. de R.L. de C.V.	Mexico
Ecolab Holdings Mexico, S. de R. L. de C. V.	Mexico
Ecolab, S. de R.L. de C.V.	Mexico
NALCO DE MEXICO, S. de R. L. de C.V.	Mexico
Abednego Environmental Services, LLC	Michigan
Abednego Mexico Holdings, LLC	Michigan
Nalco Gulf Response Corp.	Michigan
Ecolab Maroc Société à Responsabilité Limitée D'associé Unique	Morocco
Champion Technologies B.V.	Netherlands
Champion Technologies Russia and Caspian B.V.	Netherlands
ChampionX Europe B.V.	Netherlands
ChampionX LA Holding B.V.	Netherlands
ChampionX NL 1 B.V.	Netherlands

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
ChampionX Russia Holding B.V.	Netherlands
Chemical Innovations NL B.V.	Netherlands
Ecolab B.V.	Netherlands
ECOLAB NL 10 B.V.	Netherlands
Ecolab NL 11 B.V.	Netherlands
Ecolab NL 15 BV	Netherlands
Ecolab NL 16 B.V.	Netherlands
Ecolab NL 23 B.V.	Netherlands
Ecolab NL 3 BV	Netherlands
Ecolab NL 4 BV	Netherlands
Ecolab Production Netherlands B.V.	Netherlands
Ecolabone B.V.	Netherlands
Ecolabtwo B.V.	Netherlands
INTERNATIONAL WATER CONSULTANT B.V.	Netherlands
Lobster Technologies B.V.	Netherlands
Microtek Medical B.V.	Netherlands
NALCO DUTCH HOLDINGS B.V.	Netherlands
NALCO EUROPE B.V.	Netherlands
NALCO GLOBAL HOLDINGS B.V.	Netherlands
NALCO HOLDING B.V.	Netherlands
NALCO INTERNATIONAL HOLDINGS B.V.	Netherlands
NALCO NETHERLANDS BV	Netherlands
NALCO OVERSEAS HOLDING B.V.	Netherlands
NALCO UNIVERSAL HOLDINGS BV	Netherlands
Nalco Wastewater Contract Operations, Inc.	New York
ChampionX New Zealand	New Zealand
Ecolab New Zealand	New Zealand
Gallay Medical & Scientific NZ Pty Ltd	New Zealand
Ecolab y Compañía Colectiva de Responsabilidad Limitada	Nicaragua
Champion Technologies (Nig) Limited	Nigeria
ChampionX Associate Investment Company Limited	Nigeria
Kay Chemical International, Inc.	North Carolina
MOBOTEC AB, LLC	North Carolina
ChampionX Norge AS	Norway
Ecolab a.s.	Norway
International Legacy Fabrication LLC	Oman
NALCO PAKISTAN (PRIVATE) LIMITED	Pakistan
Ecolab S.A.	Panama
CHAMPIONX PNG LTD	Papua New Guinea
NANOSPECIALTIES, LLC	Pennsylvania
Ecolab Perú Holdings S.R.L.	Peru

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
Ecolab Philippines Inc. NALCO PHILIPPINES INC.	Philippines
Ecolab Production Poland sp. z o.o.	Philippines
Ecolab Services Poland Sp. z o o	Poland
Ecolab Sp. z o o	Poland
Nalco Polska Sp. z o. o.	Poland
NALCO PORTUGUESA (QUÍMICA INDUSTRIAL), UNIPessoal LDA	Poland
ChampionX (RO) Energy Services S.R.L.	Portugal
Ecolab s.r.l.	Romania
AO Ecolab	Romania
Champion Technologies OOO	Russian Federation
ChampionX Services OOO	Russian Federation
ChampionX-Element JSC	Russian Federation
Master Chemicals OOO	Russian Federation
NALCO COMPANY OOO	Russian Federation
NALCO ZAO	Russian Federation
Promchimservice Limited Liability Company	Russian Federation
Ecolab (St. Lucia) Limited	Russian Federation
Champion Arabia Ltd.	Saint Lucia
NALCO SAUDI CO. LTD.	Saudi Arabia
Ecolab Hygiene d.o.o.	Saudi Arabia
Bioquell Asia Pacific Pte. Ltd.	Serbia
ChampionX SG 2 Pte Ltd.	Singapore
ChampionX SG 3 PTE. LTD.	Singapore
ChampionX SG 4 Pte. Ltd.	Singapore
ChampionX SG Service Pte. Ltd.	Singapore
CTI Chemicals Asia Pacific Pte. Ltd.	Singapore
Ecolab Asia Pacific Pte. Ltd.	Singapore
Ecolab Pte. Ltd.	Singapore
NALCO ASIA HOLDING COMPANY PTE. LTD.	Singapore
Ecolab s.r.o.	Singapore
Ecolab d.o.o.	Slovakia
Ecolab (Proprietary) Limited	Slovenia
Lobster Ink Africa (Pty.) Ltd.	South Africa
NALCO AFRICA (PTY.) LTD.	South Africa
DERYPOL SA	South Africa
Ecolab Hispano-Portuguesa S.L.	Spain
Ecolab Spain Services S.L.U.	Spain
Hicopla SL	Spain
Instrunet Hospital SLU	Spain
NALCO ESPANOLA MANUFACTURING, S.L.U.	Spain

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
NALCO ESPAÑOLA, S.L.	Spain
Ecolab AB	Sweden
NALCO AB	Sweden
ChampionX Europe GmbH	Switzerland
Ecolab (Schweiz) GmbH	Switzerland
Ecolab CH 1 GmbH	Switzerland
Ecolab CH 2 GmbH	Switzerland
Ecolab CH 3 GmbH	Switzerland
Ecolab CH 5 GmbH	Switzerland
Ecolab CH 6 GmbH	Switzerland
Ecolab Europe GmbH	Switzerland
Lobster International S.A.	Switzerland
Nalco Schweiz GmbH	Switzerland
USF Healthcare SA	Switzerland
Ecolab Ltd.	Taiwan
NALCO TAIWAN CO., LTD.	Taiwan
Ecolab East Africa (Tanzania) Limited	Tanzania
Champion ES Holdings Inc.	Texas
Ecolab Limited	Thailand
NALCO INDUSTRIAL SERVICES (THAILAND) CO. LTD.	Thailand
Ecolab (Trinidad and Tobago)Unlimited	Trinidad and Tobago
Ecolab Temizleme Sistemleri Limited Sirketi	Turkey
Nalco Anadolu Kimya Sanayi ve Ticaret Limited Sirketi	Turkey
Oksa Kimya Sanayi A.S.	Turkey
Ecolab East Africa (Uganda) Limited	Uganda
Ecolab LLC	Ukraine
Champion Technologies Middle East FZCO	United Arab Emirates
Ecolab Gulf FZE	United Arab Emirates
Nalco Middle East FZE	United Arab Emirates
Adam Investment Company Limited	United Kingdom
R P Adam Limited	United Kingdom
Bioquell Limited	United Kingdom
Bioquell UK Limited	United Kingdom
Bioxyquell Limited	United Kingdom
CALGON EUROPE LIMITED	United Kingdom
Champion Technologies Limited	United Kingdom
ChampionX Egypt Holdings Ltd.	United Kingdom
ChampionX Egypt Ltd.	United Kingdom
Ecolab (U.K.) Holdings Limited	United Kingdom
Ecolab Limited	United Kingdom
Enviroflo Engineering Limited	United Kingdom

<u>Entity Name</u>	<u>State or Other Jurisdiction of Incorporation</u>
The Holchem Group Limited	United Kingdom
Holchem Laboratories Limited	United Kingdom
HOUSEMAN LIMITED	United Kingdom
HYDROSAN LIMITED	United Kingdom
Imperial Janitorial Supplies Limited	United Kingdom
LHS (UK) Limited	United Kingdom
London & General Packaging Ltd	United Kingdom
Merlin Chemicals Limited	United Kingdom
Microtek Medical Europe Limited	United Kingdom
Midland Research Laboratories UK Limited	United Kingdom
NALCO ACQUISITION ONE	United Kingdom
NALCO ACQUISITION TWO LIMITED	United Kingdom
NALCO HOLDINGS UK LIMITED	United Kingdom
NALCO INVESTMENTS U.K. LIMITED	United Kingdom
NALCO LIMITED	United Kingdom
NALCO MANUFACTURING LTD.	United Kingdom
NALCO NORTH AFRICA LIMITED	United Kingdom
NALCO SERVICES, LTD.	United Kingdom
NALFLOC LIMITED	United Kingdom
Shield Holdings Limited	United Kingdom
Shield Medicare Limited	United Kingdom
Shield Salvage Associates Limited (UK)	United Kingdom
Ecolab S.R.L.	Uruguay
Champion Tecnologias, C.C.A.	Venezuela
Ecolab S.A.	Venezuela
NALCO VENEZUELA S. C. A.	Venezuela
Ecolab Viet Nam Company Limited	Viet Nam

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Registration Nos. 2-90702; 33-18202; 33-55986; 33-56101; 333-95043; 333-109890; 33-34000; 33-56151; 333-18627; 333-109891; 33-39228; 33-56125; 333-70835; 33-60266; 333-95041; 333-40239; 333-95037; 333-50969; 333-58360; 333-97927; 333-115567; 333-129427; 333-129428; 333-140988; 333-115568; 333-132139; 333-147148; 333-163837; 333-163838; 333-165130; 333-165132; 333-166646; 333-174028; 333-178300; 333-178302; 333-184650; 333-190317; 333-199729; 333-199730; 333-199732; and 333-226534), Form S-4 (Registration No. 333-176601) and Form S-3 (Registration No. 333-221305) of Ecolab Inc. of our report dated February 28, 2020 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP

Minneapolis, Minnesota

February 28, 2020

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that the undersigned, a director of Ecolab Inc., a Delaware corporation, does hereby make, nominate and appoint DOUGLAS M. BAKER, JR., MICHAEL C. MCCORMICK and TIMOTHY A. BEASTROM, and each of them, to be my attorney-in-fact, with full power and authority to sign his name to the Annual Report on Form 10-K of Ecolab Inc. for the fiscal year ended December 31, 2019, and all amendments thereto, provided that the Annual Report and any amendments thereto, in final form, be approved by said attorney-in-fact, and his name, when thus signed, shall have the same force and effect as though I had manually signed said document.

IN WITNESS WHEREOF, I have hereunto affixed my signature this 28th day of February, 2020.

/s/Shari L. Ballard
Shari L. Ballard

/s/Barbara J. Beck
Barbara J. Beck

/s/Les S. Biller
Les S. Biller

/s/Jeffrey M. Ettinger
Jeffrey M. Ettinger

/s/Arthur J. Higgins
Arthur J. Higgins

/s/Michael Larson
Michael Larson

/s/David W. MacLennan
David W. MacLennan

/s/Tracy B. McKibben
Tracy B. McKibben

/s/Lionel L. Nowell, III
Lionel L. Nowell, III

/s/Victoria J. Reich
Victoria J. Reich

/s/ Suzanne M. Vautrinot
Suzanne M. Vautrinot

/s/John J. Zillmer
John J. Zillmer

CERTIFICATION

I, Douglas M. Baker, Jr., certify that:

1. I have reviewed this annual report on Form 10-K of Ecolab Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 28, 2020

/s/ Douglas M. Baker, Jr.
Douglas M. Baker, Jr.
Chairman of the Board and
Chief Executive Officer

CERTIFICATION

I, Daniel J. Schmechel, certify that:

1. I have reviewed this annual report on Form 10-K of Ecolab Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 28, 2020

/s/ Daniel J. Schmechel

Daniel J. Schmechel
Chief Financial Officer

SECTION 1350 CERTIFICATIONS

Pursuant to 18 U.S.C. Section 1350, each of the undersigned officers of Ecolab Inc. does hereby certify that:

- (a) the Annual Report on Form 10-K of Ecolab Inc. for the year ended December 31, 2019 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (b) information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of Ecolab Inc.

Dated: February 28, 2020

/s/Douglas M. Baker, Jr.
Douglas M. Baker, Jr.
Chairman of the Board and Chief Executive Officer

Dated: February 28, 2020

/s/Daniel J. Schmechel
Daniel J. Schmechel
Chief Financial Officer
