



ECOLAB[®]

2018 Annual Report

**DELIVERING
SOLUTIONS
THAT
DRIVE
SUCCESS**

ECOLAB IS EVERYWHERE IT MATTERS

BECAUSE CLEAN WATER, SAFE FOOD, ABUNDANT ENERGY AND HEALTHY ENVIRONMENTS MATTER EVERYWHERE.

A trusted partner at nearly three million customer locations, Ecolab Inc. is the global leader in water, hygiene and energy technologies and services that protect people and vital resources. Ecolab's 49,000 associates work to deliver comprehensive solutions, data-driven insights 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.

From restaurants and hotels to refineries and manufacturing facilities, Ecolab's more than 27,000 sales-and-service associates, the industry's largest and best-trained direct sales-and-service force, help customers solve their cleaning, sanitizing and water and energy management challenges. Many of the world's most recognizable brands rely on Ecolab to help ensure operational efficiencies, product integrity and brand reputation.

Ecolab is headquartered in St. Paul, Minn., and its common stock is listed under the symbol ECL on the New York Stock Exchange. For more company information, visit www.ecolab.com, or call **1.800.2.ECOLAB**. Follow us on Twitter @ecolab, Facebook at facebook.com/ecolab or LinkedIn at linkedin.com/company/ecolab.

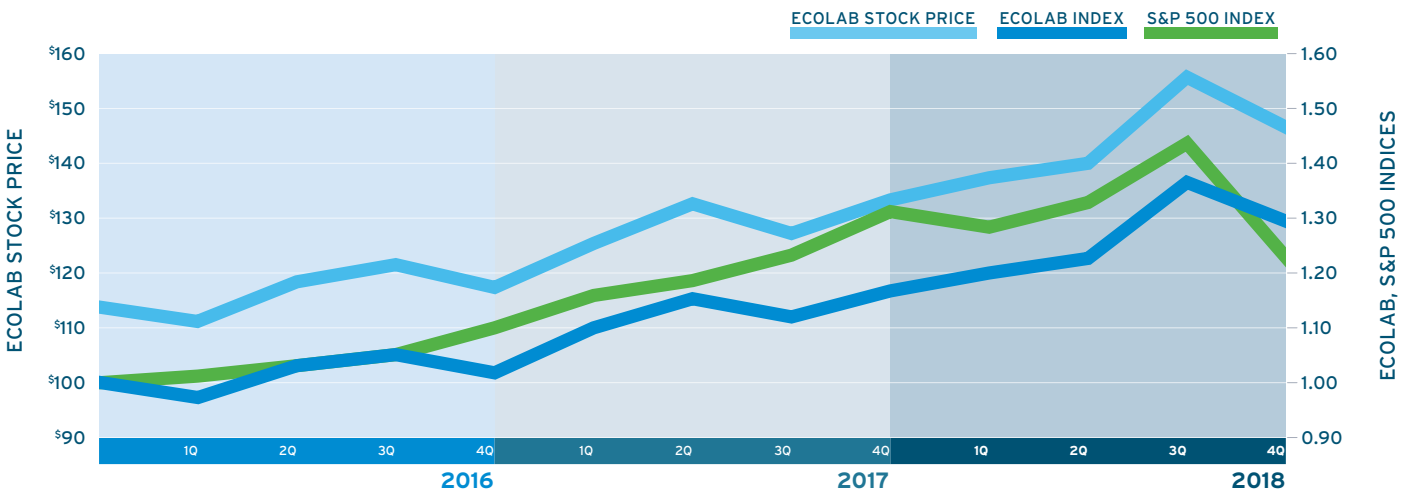
FORWARD-LOOKING STATEMENTS AND RISK FACTORS

We refer readers to the company's disclosure entitled "Forward-Looking Statements and Risk Factors," which is located on page 15 of the Form 10-K.

ECOLAB STOCK PERFORMANCE

	HIGH	LOW
2018		
Q4	\$162.91	\$135.77
Q3	159.92	138.65
Q2	150.46	132.79
Q1	140.50	125.74
2017		
Q4	\$137.96	\$128.38
Q3	134.28	127.18
Q2	134.89	124.42
Q1	126.17	117.29
2016		
Q4	\$122.28	\$110.65
Q3	124.60	116.66
Q2	121.81	109.83
Q1	113.69	98.62

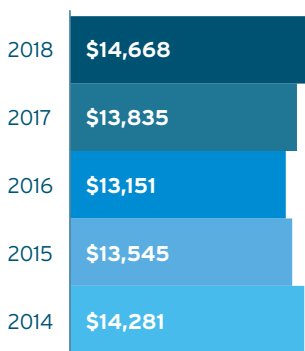
ECOLAB STOCK PERFORMANCE AND COMPARISON



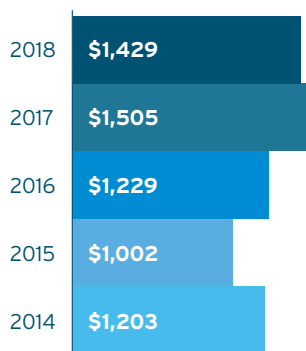
SUMMARY MILLIONS, EXCEPT PER SHARE

	2018	2017	2016	2018	2017
Net Sales	\$14,668.2	\$13,835.9	\$13,151.8	6%	5%
Net Income Attributable to Ecolab	\$1,429.1	\$1,504.6	\$1,229.0	(5)%	22%
Percent of Sales	9.7%	10.9%	9.3%	(10)%	16%
Diluted Earnings per Share	4.88	5.12	4.14	(5)%	24%
Adjusted Diluted Earnings per Share (non-GAAP measure)	5.25	4.68	4.37	12%	7%
Diluted Weighted-Average Common Shares Outstanding	292.8	294.0	296.7	0%	(1)%
Cash Dividends Declared per Common Share	1.690	1.520	1.420	11%	7%
Cash Provided by Operating Activities	2,277.7	2,091.3	1,939.7	9%	8%
Capital Expenditures	847.1	868.6	756.8	(2)%	15%
Ecolab Shareholders' Equity	8,003.2	7,583.6	6,871	6%	10%
Return to Beginning Equity	18.8%	21.9%	17.8%	-	-
Total Debt	7,045.2	7,322.7	6,687.0	(4)%	10%
Total Debt to Capitalization	46.5%	48.9%	49.1%	-	-
Total Assets	\$20,074.5	\$19,963.5	\$18,331.1	1%	9%

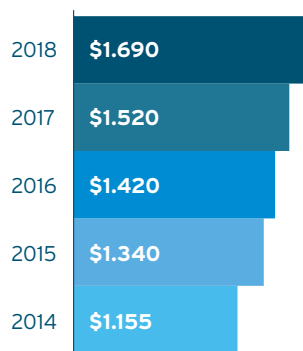
NET SALES (MILLIONS)



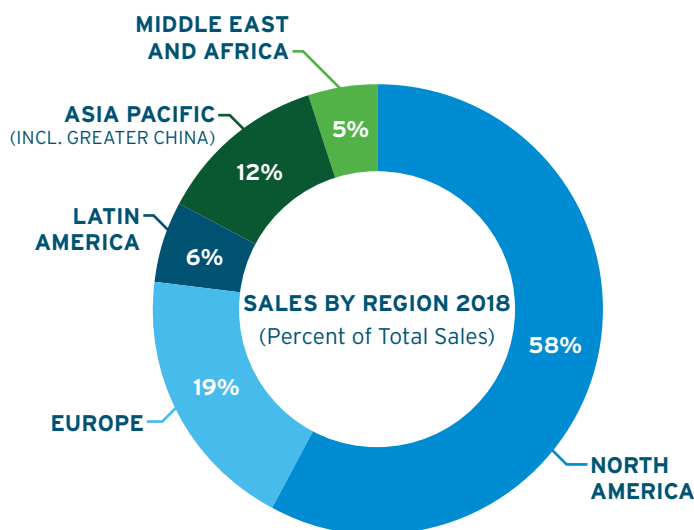
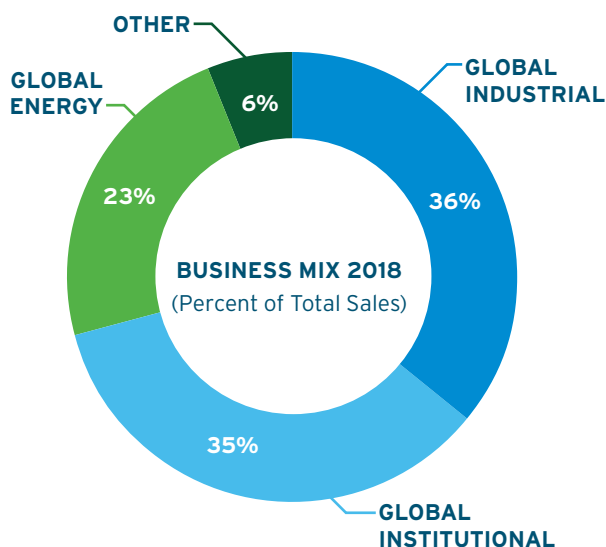
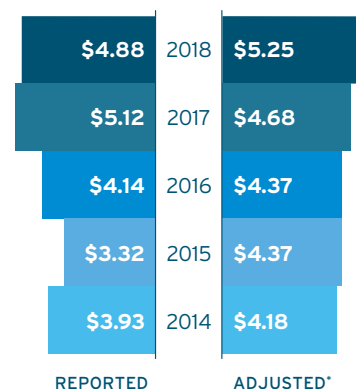
NET INCOME ATTRIBUTABLE TO ECOLAB (MILLIONS)



DIVIDENDS DECLARED PER SHARE (DOLLAR)



DILUTED EARNINGS PER SHARE (DOLLARS)



*This Annual Report includes certain non-GAAP financial measures. We refer readers to the company's disclosure entitled "Non-GAAP Financial Measures," which begins on page 48 of the Form 10-K.

IN A RAPIDLY CHANGING WORLD, ECOLAB IS IN A GREAT POSITION.

SEIZING OUR OPPORTUNITIES

The world will continue to face greater demands for food and energy, increased water shortages and growing expectations for improved public health – and we have the solutions, service and insights to help meet those needs. Most importantly, we have a talented global team that is highly motivated by our purpose and delivers for our customers, every day.

This past year our team performed very well, working hard to help our customers succeed and driving both sales volume and pricing increases while effectively managing costs. Through pricing, product innovation and ongoing efficiency efforts, we were able to offset higher than expected raw material and logistics costs. At the heart of our success is our value proposition – the best results at the lowest total cost and environmental impact for our customers.

MEETING THE WORLD'S ENERGY NEEDS THROUGH TWO WINNING ORGANIZATIONS

We continue to invest to deliver more value to our customers and communities and sharpen our focus on our core businesses. In early February 2019, we announced our plans to spin off our upstream energy services business into a stand-alone company that will operate separately from Ecolab. Our downstream energy business will remain with Ecolab as part of our Global Industrial group. Ecolab shareholders will own shares in both Ecolab and the new upstream company once the process is complete, which we anticipate by mid 2020, subject to regulatory filings and board approvals.

Our upstream business, which is comprised of our WellChem and Oilfield Chemicals (OFC) businesses, primarily serves the drilling and production part of the oil and gas lifecycle. Our downstream business serves refineries and petrochemical facilities. As unconventional oil and gas production has grown, WellChem and OFC offerings have become more similar and both increasingly operate like specialty chemical businesses, which require different operating disciplines and expertise than the rest of Ecolab. We believe that as a stand-alone company, upstream will be able to grow faster because it can make the investments

and drive the disciplines necessary to continue growing in this market. Meanwhile, the product offering and service model of our downstream business align well with our other businesses, with significant cross-selling opportunities.

The result of this spin-off will be two best-in-class organizations with distinct and winning business models.

INTEGRATING DIGITAL

We follow the belief that to perform over time, our customer value has to increase over time. Understanding needs, leveraging technology and developing solutions that improve customer outcomes is how we do this.

Integrating digital technologies into our offerings represents a step-change opportunity. Already we collect unique data at nearly three million customer locations globally. Collecting this data in the cloud, using artificial intelligence (AI) tools to develop insights and predictive analytics, and targeting our field resources toward customers' biggest needs are proving to be a big game changer and one where we are uniquely advantaged.

We already are seeing results through ECOLAB3D™, our company's digital engine that translates data into actionable insights, giving our customers the power to take their performance and operations to the next level. We're tracking and monitoring food safety for large global customers by gathering real-time data across a large number of units and, even better, understanding how to drive improved outcomes at even lower costs for our customers. Opportunities to leverage these capabilities are numerous: helping customers with cooling towers better understand *Legionella* risks, helping healthcare facilities reduce infection risk, and helping large industrial players further reduce water and carbon footprints.

HARNESSING OUR DATA

We are working on our internal systems too and are nearing completion of our enterprise resource planning (ERP) system upgrade, developing a more seamless operating environment that allows us to better organize and harness our company's data. Through this new system, we have been building scalable

FASTER, SMARTER AND BETTER

business processes that make us more efficient and reliable, with common tools to enable the development of insights on the back end. Thanks to the substantial global efforts of our implementation team, we are nearing completion of the project and are already delivering on its ultimate goals: happier customers, focused sales teams, empowered associates and lower costs.

BECOMING FASTER, SMARTER AND BETTER

The investments in our enterprise resource planning system and digital innovation are enabling us to become faster, smarter and better. In August, we launched an efficiency initiative to capitalize on these investments by simplifying our organization, building on our cultural strengths and leveraging the power of digital to drive customer value and team productivity. Our goal: to achieve faster growth through smarter decision-making, creating better outcomes. We are making steady progress on our plans, which we expect will deliver \$325 million in annual run rate cost savings by 2021 as we fully realize the benefits of our investments.

DELIVERING ON OUR PURPOSE

While the way we deliver value continues to improve, our focus on our organization's purpose – to make the world cleaner, safer and healthier, protecting people and vital resources – is unwavering. We help our customers operate more effectively and efficiently every day – improving quality and enhancing safety while simultaneously reducing water and carbon footprints, which also saves them money.

In 2018, through our unique blend of technology, expertise and on-site service, we helped our customers save 188 billion gallons of water and reduce energy use by 19 trillion BTUs. By using recycled plastics and reusing packaging, we reduced our customers' plastic use by 54 million pounds. Over the years,



we've seen that positive change accelerates when economic and environmental goals come together.

PEOPLE AND CULTURE

Ultimately we can only achieve our goals if we have a talented global team. This starts with the board, where we added two great new members in Shari L. Ballard and Lionel L. Nowell, III. Our team also continues to work to create an environment that attracts the world's most capable talent and enables them to do their best work. We want to be a company that encourages everyone to reach their potential. We made meaningful progress in 2018 in continuing to build our team – engagement and diversity continue to improve as did our collective results.

POSITIONED FOR IMPACT

We enter 2019 well positioned to continue to drive our successful formula: great teams that create great customer and community value, delivering outsized shareholder value. Our mission keeps us focused. Our impact keeps us motivated.

We have excellent momentum and a clear line of sight on how we can further improve. We have a big agenda ahead of us, but we also have a great team to get after it. As always, we will strive to deliver.

Thank you for your trust; we will keep working to prove it is well placed.

SINCERELY,

A handwritten signature in blue ink, appearing to read 'Doug Baker, Jr.', written in a cursive style.

Douglas M. Baker, Jr.
CHAIRMAN AND CHIEF EXECUTIVE OFFICER

Our goal: to achieve faster growth through smarter decision-making, creating better outcomes.

net sales

**\$14.7
BILLION**

+6%

operating income

**\$1.9
BILLION**

**\$2.1
BILLION
ADJUSTED**

+5%

diluted earnings

**\$4.88
PER SHARE
REPORTED**

**\$5.25
PER SHARE
ADJUSTED**

+12%

cash dividends
declared

**\$1.69
PER COMMON
SHARE**

+11%

cash flow from
operations

**\$2.3
BILLION**

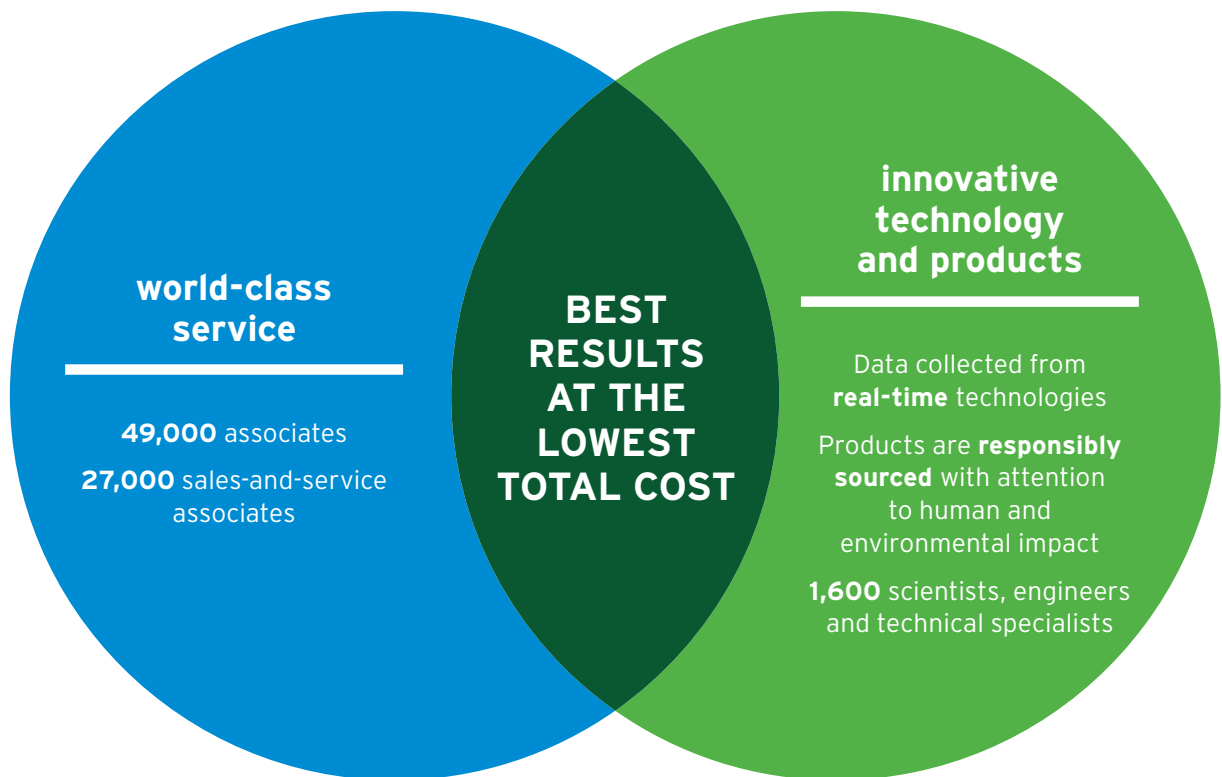
+9%

year-end
share price

\$147.35

+10%

In every industry we serve, we combine world-class, personalized service with best-in-class technology and products to help our customers succeed. Our approach gives us a competitive advantage no other company can match.



Through millions of customer visits across a range of industries around the world, we gain first-hand knowledge of the challenges businesses face. In addition to our deep industry expertise and wealth of data, we use advanced analytics to develop predictive insights and initiate corrective action before issues occur.

OUR APPROACH TO INNOVATION

Our innovation strategy is based on chemistry, digital technology and service to deliver exponential customer value. Our team of 1,600 scientists, engineers and technical specialists create best-in-class solutions that are responsibly sourced and developed with close attention to human and environmental impact. With our expertise in core technologies, including antimicrobials, dispensing and monitoring, personal and environmental hygiene, polymers, surfactants, solid chemistry, water management and data analytics, we help improve operational efficiency, product quality and safety for our customers.

REPORTING SEGMENTS

Ecolab's powerful, proven growth strategy is straightforward: Circle the Customer – Circle the Globe. This strategy drives us to provide customers with the most comprehensive and sustainable solutions needed to run a clean, safe and healthy business – no matter where they're located. Every day, we seek ways to expand our ability to serve customers with a range of effective product and service solutions.

This translates to a win-win situation – as our customers grow and succeed in their businesses, so do we. Our global strategy is designed to meet our customers' desires to drive global results. To accomplish this, we have global businesses that are reported within four segments:

GLOBAL INDUSTRIAL

Provides water treatment and process applications, and cleaning and sanitizing solutions primarily to industrial customers within the manufacturing, food and beverage processing, chemical, primary metals, power generation, pulp and paper, mining and commercial laundry industries. Operating units within the Global Industrial reportable segment include Water, Food & Beverage, Paper, Textile Care and Life Sciences.

GLOBAL INSTITUTIONAL

Provides specialized cleaning and sanitizing products to the foodservice, hospitality, lodging, healthcare, government, education and food retail industries. Operating units within the Global Institutional reportable segment include Institutional, Specialty and Healthcare.



GLOBAL ENERGY

Operating under the Nalco Champion name, serves the process chemical and water treatment needs of the global petroleum and petrochemical industries in both upstream and downstream applications.

OTHER

Provides pest elimination services in restaurants, food and beverage processing plants, educational and healthcare facilities, hotels, quick-service restaurants and grocery operations through the Pest Elimination business unit. We also produce and sell colloidal silica for binding and polishing applications across various industries, including semiconductor manufacturing and aerospace component manufacturing through our Colloidal Technologies Group.



PRODUCT INNOVATION AND BUSINESS HIGHLIGHTS

Ecolab's 2018 new product innovations are projected to deliver \$1.3 billion in total annual revenue in five years. We introduced several new solutions, enabled by digital technology, to help our customers improve operational efficiency while reducing their environmental impact. We also made acquisitions that further expand our hygiene and water treatment capabilities.



new solutions

Digital Food Safety Automation is part of our burgeoning digital program that helps improve food safety outcomes through mobile applications, such as an automated food safety checklist. This saves customers time and provides deeper insight and analytics into food safety performance.

MARKETGUARD™ 365 collects and consolidates food safety data for food retail operators through an online portal and mobile app. The tool provides real-time insights into food safety compliance and digitizes food safety tasks and temperature monitoring.

Laundry Detergents Plus and Ultra are high-performance detergents designed to help customers tackle the toughest stains while leaving linens clean, white, soft and fresh.

OMNI combines chemistry, 3D TRASAR™ Technology, sensors and data analytics to help power and chemical producers improve production efficiency, capture energy savings and avoid production outages.

acquisitions

ACQUIRED CASCADE WATER SERVICES

With 2017 sales of approximately \$35 million, Cascade broadens the range of water treatment services we provide to commercial building, lodging and healthcare facilities in the eastern U.S.

ACQUIRED HOLCHEM GROUP LIMITED

We acquired this U.K.-based supplier of hygiene and cleaning products and services for the food and beverage, foodservice and hospitality industries. With operations in the U.K. and Ireland, Holchem's 2017 sales were approximately \$56 million.

ACQUIRED BIOQUELL PLC

We offered to acquire this leading provider of hydrogen peroxide vapor bio-decontamination systems and services for the life sciences and healthcare industries. The transaction was completed in January 2019. Headquartered in Andover, U.K., Bioquell's 2017 sales were approximately \$37 million.

Through how we operate and develop solutions to the way we work with customers and support communities, we are working to deliver a better future for everyone.

HELPING OUR CUSTOMERS REDUCE THEIR ENVIRONMENTAL IMPACT

At Ecolab, sustainability is an integral part of everything we do. Through technology, insights, service and training, we help companies around the world achieve exceptional business results while minimizing environmental impact. Our expertise and approach to innovation helps customers reduce their reliance on finite natural resources and achieve the best results at the lowest total cost.

Please see our Sustainability report, available at www.ecolab.com/sustainability.

STRENGTHENING COMMUNITIES

We strive to enrich and strengthen the communities in which we do business by supporting educational programs and charitable and civic organizations. Our long-standing commitment to communities includes grants to nonprofit organizations, in-kind product donations and employee volunteerism. In 2018, the total impact of our giving was nearly \$17 million.

In 2018, grants totaling \$14 million were provided by Ecolab and the Ecolab Foundation to 910 nonprofit organizations across the U.S. that align with the foundation's four focus areas of youth and education, civic and community development, arts and culture, and environment and conservation.

Through our in-kind giving program, more than \$1.5 million of cleaning and sanitizing products was donated in support of disaster relief efforts around the world.

Our global giving program, Solutions for Life, which enhances our mission to conserve water and improve hygiene around the world, has partnered with Project WET to reach more than 7 million people through the co-created Clean and Conserve Education Program, and with The Nature Conservancy to protect multiple water sources in Mexico, China and the United States, helping to provide safe water to millions of people around the world.



SUSTAINABILITY IS CORE TO OUR BUSINESS STRATEGY

in 2018, we helped our customers:

SAVE
188
BILLION
GALLONS
OF WATER

REDUCE ENERGY
USE BY
MORE THAN
19 TRILLION
BTUS

ELIMINATE
54 MILLION
POUNDS
OF WASTE

By 2030, Ecolab aims to conserve 300 billion gallons of water annually by reducing water consumption within our own and our customers' operations. This is equivalent to the annual drinking water needs of more than 1 billion people.

our 2020 sustainability goals

REDUCE WATER
WITHDRAWAL BY
25%*

REDUCE GREENHOUSE
GAS EMISSIONS BY
10%*

Ecolab is often recognized for our leadership, innovation, corporate social responsibility and commitment to sustainability. In 2018, Ecolab was recognized by several leading organizations.

business recognition



2018 WORLD'S MOST ADMIRABLE COMPANIES

Ecolab was again named to Fortune's 2018 list of the World's Most Admired Companies, ranking third in the chemicals industry.



2018 WORLD'S MOST ETHICAL COMPANIES

For the 12th consecutive year, Ecolab was named to Ethisphere Institute's list of the World's Most Ethical Companies.



2018 50 BEST COMPANIES TO SELL FOR

Ecolab was named to Selling Power's 50 Best Companies to Sell For list. The list is based on compensation and benefits, hiring, sales training, sales enablement and customer retention.



2018 WORLD'S MOST INNOVATIVE COMPANIES

For the fifth time since the list's inception in 2011, Forbes named Ecolab to its World's Most Innovative Companies, ranking 93rd on the 2018 list.

workplace recognition



2018 BEST EMPLOYERS FOR WOMEN

Ecolab was named to Forbes magazine's inaugural list of America's Best Employers for Women. The list ranks leading employers based on several gender-equality factors, including diversity, parental leave and pay equality.



2018 BEST PLACES TO WORK FOR LGBT EQUALITY

Ecolab received a perfect score of 100 percent in the Corporate Equality Index, a national report on corporate policies and practices related to LGBT workplace equality, administered by the Human Rights Campaign Foundation.



2018 BEST EMPLOYERS FOR DIVERSITY

Ecolab was named to Forbes magazine's Best Employers for Diversity list. The list ranks employers based on diversity in gender, ethnicity, sexual orientation, age and disability.



2018 WORLD'S BEST EMPLOYERS

Ecolab was named to Forbes' 2018 list of the World's Best Employers as well as Forbes' 2018 list of America's Best Employers, ranking seventh in the Business Services & Supplies industry category.

sustainability recognition



2018 SUSTAINABLE DEVELOPMENT GOLD MEDAL

The World Environment Center recognized Ecolab's many initiatives to support global sustainable water management and conservation, sustainability commitments and partnerships, and integration of sustainability in the innovation process and product development.



2018 DOW JONES SUSTAINABILITY INDEX

Ecolab was named to the 2018 Dow Jones Sustainability North America Index for the fourth consecutive year. The index is based on an analysis of corporate economic, environmental and social performance.



FTSE4GOOD

Ecolab was named to the FTSE4Good Index for the fourth consecutive year. The index is designed to measure the performance of companies demonstrating strong environmental, social and governance practices.



2018 100 BEST CORPORATE CITIZENS

Ecolab was ranked in the top 10 on Corporate Responsibility Magazine's 100 Best Corporate Citizens list for the fifth consecutive year.

**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, 2018

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	Name of each exchange on which registered
Common Stock, \$1.00 par value	New York Stock Exchange, Inc.
2.625% Euro Notes due 2025	New York Stock Exchange, Inc.
1.000% Euro Notes due 2024	New York Stock Exchange, Inc.

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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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 29, 2018, the last business day of the Registrant's most recently completed second fiscal quarter: \$40,354,321,454 (see Item 12, under Part III hereof), based on a closing price of registrant's Common Stock of \$140.33 per share.

The number of shares of registrant's Common Stock, par value \$1.00 per share, outstanding as of January 31, 2019: 287,853,232 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the Annual Meeting of Stockholders to be held May 2, 2019, and to be filed within 120 days after the registrant's fiscal year ended December 31, 2018 (hereinafter referred to as "Proxy Statement"), are incorporated by reference into Part III.

ECOLAB INC.
FORM 10-K
For the Year Ended December 31, 2018

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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", "Nalco Company" and "Nalco Champion" 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 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.

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 2018 sales of \$14.7 billion, 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.

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, 2018, 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 do not meet the quantitative criteria to be separately reported have been combined into the Other segment. 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, with the exception of the pulp and paper industry which is serviced by Paper and the energy industries which are served by Energy. 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-foams, 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, maintenance and capital expenditure avoidance 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 suppliers world-wide among 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. 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 suppliers world-wide 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. 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 suppliers world-wide of water treatment products and process aids to the pulp and papermaking industry.

Life Sciences

Life Sciences provides 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. 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 device. Our tailored, comprehensive solutions and technical know-how focus on ensuring product quality and safety 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 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 suppliers world-wide 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. 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 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 for accounts 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.

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 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, which operates primarily under the Nalco Champion name, 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 composed primarily of our WellChem and Oil Field Chemicals businesses and a downstream refinery and petrochemical processing group. Our upstream group 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. Upstream 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.

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 aggregated. 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

Effective in the first quarter of 2018, we established the Colloidal Technologies Group ("CTG") operating segment. 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. Operations were solely in the United States.

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.

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, 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 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 field sales personnel who also advise and assist our customers in the proper and 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 49,000 employees as of December 31, 2018.

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 constitutes 10 percent or more of our 2018 consolidated revenues, 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 2018, 2017 and 2016.

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 3% 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, 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 2018, the impact on our consolidated net income of our joint ventures, in the aggregate, was less than 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. Ltd.	Saudi Arabia	Global Energy, Global Industrial
Nalco Angola Prestação de Serviços, Limitada	Angola	Global Energy
RauanNalco LLP	Kazakhstan	Global Energy
Nalco Champion EG Sarl	Equatorial Guinea	Global Energy
Emirates National Chemical Company LLC	United Arab Emirates	Global Energy
Malaysian Energy Chemical & Services Sdn. Bhd.	Malaysia	Global Energy
Arpal Gulf, LLC	United Arab Emirates	Global Institutional
Nalco Champion Dai-ichi India Private Limited	India	Global Energy
Nalco Champion Ghana Limited	Ghana	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
Aquatech International, LLC	United States	Global Industrial
Treated Water Outsourcing	United States	Global Industrial
Derypol, S.A.	Spain	Global Industrial
Century LLC	United States	Global Institutional
Kogalym Chemicals Plant LLC	Russia	Global Energy
Petrochem Performance Products	Azerbaijan	Global Energy
HanSteel Nalco Water Treatment (Handan) Co., Limited	China	Global Industrial

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 nine 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 (“LCSA”) in 2016. The LCSA 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 other countries (e.g., Australia, Canada, Thailand). 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 Product Directive and the more recent 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 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 \$60 million in 2018 and \$70 million in 2017. Approximately \$60 million has been budgeted globally for projects in 2019.

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). Ecolab is 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.

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 28 sites in the United States. Additionally, we have similar liability at seven 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.

The prosecution office of Liu He district, Nanjing City, Jingsu Province, China, brought charges alleging violation of environmental laws relating to waste disposal against the Company's Nalco subsidiary in Nanjing City, China on November 26, 2018. Prior to these charges being alleged, related charges were brought against certain individual employees of the subsidiary. The case, which is seeking to assess monetary penalties, is pending for trial before the People's Court of Liu He District. The subsidiary could also be subject to a separate civil penalty. We anticipate that this matter will not have a material adverse effect on our consolidated results of operations, financial position or cash flows.

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.

Our worldwide net expenditures for contamination remediation were approximately \$3 million in 2018 and \$6 million in 2017. Our worldwide accruals at December 31, 2018 for probable future remediation expenditures, excluding potential insurance reimbursements, totaled approximately \$17 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. After the easing of certain sanctions by the United States against Iran in January 2016 pursuant to the Joint Comprehensive Plan of Action relating to Iran's nuclear program (JCPOA), and in compliance with the economic sanctions regulations administered by U.S. Treasury's Office of Foreign Assets Control (OFAC) and U.S. export control laws, a wholly-owned non-U.S. subsidiary of the Company conducting business in our Energy operating segment has completed sales relating to Iran pursuant to and in compliance with the terms and conditions of OFAC's General License H, including sales of products used for process and water treatment applications in (i) upstream oil and gas production and (ii) petrochemical plants. The Company has reported these sales in its previous reports on Form 10-Q and Form 10-K.

On May 8, 2018, the President announced his decision to cease the United States' participation in the JCPOA, and to begin reimposing, following a wind-down period, the sanctions that were lifted to effectuate the JCPOA sanctions relief. In conjunction with this announcement, the President issued a National Security Presidential Memorandum (NSPM) directing the Secretary of State and the Secretary of the Treasury to prepare immediately for the reimposition of all of the U.S. sanctions lifted or waived in connection with the JCPOA, to be accomplished as expeditiously as possible and in no case later than 180 days from the date of the NSPM. On June 27, 2018, OFAC revoked General License H and issued a wind-down general license that authorized, through November 4, 2018, the wind down of activities involving Iran that were previously authorized pursuant to General License H. Our non-U.S. subsidiary timely completed the winding down of its business activities in Iran pursuant to the wind-down license. For its fiscal year 2018, through the completion of the wind-down period, our non-U.S. subsidiary completed the following sales related to businesses in our Energy operating segment to a distributor in Dubai and two distributors in Iran: sales of products used for process and water treatment applications in (i) upstream oil and gas production and (ii) petrochemical plants totaling \$4.7 million. The net profit before taxes associated with these sales is estimated to be \$0.9 million.

In addition to the foregoing, as authorized by 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 \$0.6 million during the subsidiary's fiscal year ended November 30, 2018, and additional sales of such products totaling \$0.1 million were completed during December 2018. The net profit before taxes associated with these sales for each period were nominal. Rhum was previously jointly owned by BP Exploration Operating Company Limited (BP) and Iranian Oil Company (U.K.) Limited. BP completed the sale of its ownership stake in the Rhum joint arrangement and transferred its role as operator to Serica Energy plc on November 30, 2018. 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.

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.

<u>Name</u>	<u>Age</u>	<u>Office</u>	<u>Positions Held Since Jan. 1, 2014</u>
Douglas M. Baker, Jr.	60	Chairman of the Board and Chief Executive Officer	Jan. 2014 – Present
Christophe Beck	51	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	May 2018 – Present May 2017 – May 2018 May 2015 – May 2017 Jan. 2014 – May 2015
Larry L. Berger	58	Executive Vice President and Chief Technical Officer	Jan. 2014 – Present
Alex N. Blanco	58	Executive Vice President and Chief Supply Chain Officer	Jan. 2014 – Present
Darrell R. Brown	55	Executive Vice President and President – Energy Services Executive Vice President, Global Downstream and WellChem Executive Vice President and President – Europe Executive Vice President and President – Asia Pacific	Jan. 2018 – Present Apr. 2017 – Dec. 2017 Feb. 2014 – Mar. 2017 Jan. 2014
Angela M. Busch	52	Executive Vice President – Corporate & Business Development Senior Vice President – Corporate Development	Aug. 2018 - Present Jan. 2014 – Aug. 2018
Thomas W. Handley	64	President and Chief Operating Officer	Jan. 2014 – Present
Michael A. Hickey	57	Executive Vice President – Special Initiatives Executive Vice President and President – Global Institutional	Oct. 2018 – Present Jan. 2014 – Sept. 2018
Roberto Inchaustegui	63	Executive Vice President and President – Global Services and Specialty	Jan. 2014 – Present
Bruno Lavandier	52	Senior Vice President and Corporate Controller Senior Vice President, Ecolab Catalyst Program Senior Vice President of Finance, Global Supply Chain Vice President of Finance, Global Supply Chain President TIORCO and Vice President of Nalco EOR (Enhanced Oil Recovery) Solutions	May 2017 – Present Mar. 2017 – Apr. 2017 Jan. 2015 – Feb. 2017 Aug. 2014 – Dec. 2014 Jan. 2014 – July 2014
Laurie M. Marsh	55	Executive Vice President – Human Resources	Jan. 2014 – Present
Michael C. McCormick	56	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 Corporate Compliance Officer, Associate General Counsel and Assistant Secretary	Oct. 2017 – Present Mar. 2017 – Sep. 2017 June 2016 – Feb. 2017 Mar. 2014 – May 2016 Jan. 2014 – Feb. 2014
Timothy P. Mulhere	56	Executive Vice President and President – Global Institutional Executive Vice President and President – Regions Executive Vice President and President – Global Water and Process Services	July 2018 – Present May 2015 – June 2018 Jan. 2014 – May 2015
Daniel J. Schmechel	59	Chief Financial Officer and Treasurer Chief Financial Officer	Jan. 2017 – Present Jan. 2014 – Dec. 2016

Name	Age	Office	Positions Held Since Jan. 1, 2014
Elizabeth A. Simermeyer	54	Executive Vice President – Global Marketing & Communications and Life Sciences Senior Vice President – Global Marketing & Communications	July 2015 - Present Feb. 2014 – July 2015 ¹
Jill S. Wyant	47	Executive Vice President and President – Global Regions and Global Healthcare Executive Vice President and President – Global Food & Beverage, Healthcare and Life Sciences Executive Vice President and President – Global Food & Beverage	Jan. 2018 – Present May 2016 – Dec. 2017 Jan. 2014 – Apr. 2016

1. Prior to joining Ecolab in February 2014, Ms. Simermeyer was employed by S. C. Johnson & Son, Inc., most recently as Senior Vice President – Home Cleaning.

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
- 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
- anticipated spin-off of the upstream group of our Energy business, including form of transaction, timing and tax effects

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 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 and emerging markets such as China and Brazil, has also negatively impacted many of our end-markets. Weaker economic activity may continue to adversely affect these 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, an adverse effect on our business.

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 our Enterprise Resource Planning ("ERP") system upgrade, our business could be adversely affected.

We continue to execute key business initiatives, including investments to develop business systems and restructurings such as those discussed under Note 3 entitled "Special (Gains) and Charges" of this Form 10-K, as part of our ongoing efforts to improve our efficiency and returns. In particular, we are implementing an ERP system upgrade, which is expected to continue in phases over the next several years. This upgrade, which includes supply chain, commercial operations and certain finance functions, is expected to improve the efficiency of certain financial and related transactional processes. The upgrade involves complex business process design and a failure of certain of these processes could result in business disruption. 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 be adversely 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 and 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 and legal and regulatory costs; could result in third-party claims; could result in compromise or misappropriation of our intellectual property, trade secrets and 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 continue to implement our ERP system upgrade.

We are pursuing a plan to spin off our Upstream Energy business into an independent publicly traded company. The proposed spin-off may not be completed on the currently contemplated timeline or at all and may not achieve the intended benefits.

We have announced a plan to spin off our Upstream Energy business into an independent publicly traded company by mid-year 2020. Unanticipated developments, including possible delays in obtaining various regulatory approvals or clearances and trade qualifications, uncertainty of the financial markets and challenges in establishing infrastructure or processes, could delay or prevent the proposed spin-off or cause the proposed spin-off to occur on terms or conditions that are less favorable and/or different than expected. Even if the transaction is completed, we may not realize some or all of the anticipated benefits from the spin-off. Expenses incurred to accomplish the proposed spin-off may be significantly higher than what we currently anticipate. Executing the proposed spin-off also requires significant time and attention from management, which could distract them from other tasks in operating our business. Following the proposed spin-off, the combined value of the common stock of the two publicly-traded companies may not be equal to or greater than what the value of our common stock would have been had the proposed spin-off not occurred.

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. 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 match the growth and development of our business. Our operations could be 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 a more 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 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 2018, approximately 47% 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 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.

Brexit, and the subsequent notification in March 2017 of the U.K.'s intention to withdraw from the EU, has created uncertainties in the economic, political and business environment in the U.K. and the EU. 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.

In addition, changes in U.S. or foreign government policy on international trade, including the imposition or continuation of tariffs, could 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. These tariffs, and any additional 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 adversely affect 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 adversely affect our consolidated results of operations, financial position or cash flows.

Our results could be 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 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 adversely affect our business.

Consolidation of our customers and vendors could 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 an adverse impact on our ability to retain customers and on our margins and consolidated results of operations.

Our business depends on our ability to comply with laws and governmental regulations, and we may be 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 adversely affect 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 adversely affect our operations and expose us to potential financial liability.

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

As described in Part II, Item 8, Note 15, "Commitments and Contingencies," of this Form 10-K, Nalco Company and certain affiliates (collectively "Nalco") have been named as a defendant in a series of class action and individual plaintiff lawsuits arising from the use of our COREXIT dispersant in response to the Deepwater Horizon oil spill, which could expose us to monetary damages or settlement costs. The plaintiffs in these matters claimed damages under products liability, tort and other theories.

There currently remain nine cases pending against Nalco. We expect they will be dismissed pursuant to a November 28, 2012 order granting Nalco's motion for summary judgment. We cannot predict whether there will be an appeal of the dismissal, the involvement we might have in these matters in the future or the potential for future litigation. However, if an appeal by plaintiffs in these lawsuits is brought and won, these suits could have an adverse effect on our consolidated results of operations, financial position or cash flows.

Nalco continues to sell the COREXIT oil dispersant product and could be exposed to future lawsuits from the use of such product. We cannot predict the potential for future litigation with respect to such sales. However, if one or more of such lawsuits are brought and won, these suits could have an adverse impact on our 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 an adverse impact on our margins and consolidated results of operations.

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

Changes in tax laws and unanticipated tax liabilities could 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, such as interpretation as to the legality of tax advantages granted under the European Union state aid rules. 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 an 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 adversely affect 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 adversely affect our liquidity and financial statements.

As of December 31, 2018, we had approximately \$7.0 billion in outstanding indebtedness, with approximately \$742 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, 2018 would increase future interest expense by approximately \$7 million per year; and
- increasing our cost of funds 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 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 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 adversely affect our business.

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, 2018, we had goodwill of \$7.1 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 adversely affect our consolidated results of operations and financial position.

A chemical spill or release could 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 an 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 an 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 an adverse effect on our consolidated results of operations, financial position or cash flows.

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 an adverse effect on our consolidated results of operations or cash flows for the affected earnings periods.

Federal government shutdowns can have an 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 an 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 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 producing intermediates via basic reaction chemistry and subsequently blending and packaging those intermediates with other purchased raw materials into finished products in powder, solid and liquid form. 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	Majority 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
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

Location	Approximate Size (Sq. Ft.)	Segment	Majority Owned or Leased
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
Yongsan, 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.

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. 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, 2019, we had 5,962 holders of record of our Common Stock.

Issuer Purchases of Equity Securities

<u>Period</u>	<u>Total number of shares purchased (1)</u>	<u>Average price paid per share (2)</u>	<u>Total number of shares purchased as part of publicly announced plans or programs (3)</u>	<u>Maximum number of shares that may yet be purchased under the plans or programs (3)</u>
October 1-31, 2018	771,940	\$148.3339	770,898	9,457,829
November 1-30, 2018	402,899	154.0127	400,674	9,057,155
December 1-31, 2018	417,857	154.1372	405,761	8,651,394
Total	1,592,696	\$151.2930	1,577,333	8,651,394

- (1) Includes 15,363 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)	2018 ⁽¹⁾	2017 ⁽²⁾	2016 ⁽³⁾	2015 ⁽⁴⁾	2014 ⁽⁵⁾
Year ended December 31:					
Net sales	\$14,668.2	\$13,835.9	\$13,151.8	\$13,545.1	\$14,280.5
Operating income	1,947.0	1,950.1	1,870.2	1,561.3	1,955.0
Net income attributable to Ecolab	1,429.1	1,504.6	1,229.0	1,002.1	1,202.8
Basic earnings per share	4.95	5.20	4.20	3.38	4.01
Diluted earnings per share, as reported (U.S. GAAP)	4.88	5.12	4.14	3.32	3.93
Cash dividends declared per common share	1.690	1.520	1.420	1.340	1.155
Diluted earnings per share, as reported (U.S. GAAP)					
Adjustments:	\$4.88	\$5.12	\$4.14	\$3.32	\$3.93
Special (gains) and charges	0.35	0.19	0.21	1.25	0.20
Discrete tax expense (benefits)	0.02	(0.63)	0.01	(0.21)	0.04
Adjusted diluted earnings per share (Non-GAAP)	\$5.25	\$4.68	\$4.37	\$4.37	\$4.18
At December 31:					
Total assets	\$20,074.5	\$19,963.5	\$18,331.1	\$18,641.7	\$19,427.4
Long-term debt (excluding portions due within one year)	6,301.6	6,758.3	6,145.7	4,260.2	4,843.4

Selected financial data for years earlier than 2016 are 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 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 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.

(2) 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.

(3) 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.

(4) 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.

(5) Special (gains) and charges for 2014 include the following net of tax, restructurings charges of \$65.0 million, integration costs of \$19.8 million, and gains of \$23.3 million related to a favorable licensing settlement, other settlement gains, consolidation of a subsidiary, removal of the corresponding equity method investment and gain on the sale of a business.

Discrete tax expense (benefits) for 2014 include \$18.2 million of expenses driven primarily by the rate differential on certain prior year shared costs, the remeasurement of certain deferred tax assets and liabilities resulting from a change in the state tax rate for certain entities following the merger of Champion operations, the change of a valuation allowance related to the realizability of foreign deferred taxes, an update to non-current tax liabilities for global tax audits and an adjustment related to re-characterization of intercompany payments between our U.S. and foreign affiliates. Expenses were offset by various tax adjustments for a net benefit of \$5.0 million.

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

Adoption of New Accounting Standards

On January 1, 2018 we retrospectively adopted the Accounting Standards Codification Topic 606 Revenue from Contracts with Customers and the related amendments ("the new revenue standard"). Concurrent with the adoption of the new revenue standard, we reclassified certain costs from selling, general and administrative expenses to cost of sales, to align the cost of providing the service with the recognition of service revenue. The new revenue standard was applied to all periods presented and the cumulative effect of applying the standard is recognized at the beginning of the earliest year presented.

We also retrospectively adopted Accounting Standards Update 2017-07 Compensation – Retirement Benefits: Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, relating to the presentation of the components of net periodic benefit costs for pension and other post-retirement benefits within the Consolidated Statement of Income ("the new pension standard").

All comparisons and discussion throughout the MD&A reflect the adoption of the new revenue standard and new pension standard. Further information about the adoption of the accounting standards is included in Note 2.

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. Fixed currency exchange rates are generally based on existing market rates at the time they are established. Fixed currency amounts during 2018 for Argentina operations are reflected at the Argentine Peso rate established by management at the beginning of the year. 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

Effective in the first quarter of 2018, we established the Colloidal Technologies Group ("CTG") operating segment. The CTG operating segment has not been aggregated, based on qualitative criteria, and is included in Other. 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 was previously recorded in the Water operating segment which is aggregated into the Global Industrial reportable segment. Prior to the sale in November 2017, the Equipment Care operating segment was also included, which provided kitchen repair and maintenance. Additionally, 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 are based on the new operating segment structure effective in the first quarter of 2018.

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 accelerating sales and earnings growth through 2018 as we drove new product introductions, new business wins and improved operating efficiency in a generally improved market environment. Increased pricing was implemented to offset significantly higher delivered product costs. Adjusted diluted earnings per share leveraged the good operating income growth, benefiting from lower interest expense and taxes, to deliver the year's double-digit adjusted diluted EPS growth.

Sales

Reported sales increased 6% to \$14.7 billion in 2018 from \$13.8 billion in 2017. Sales were positively impacted by volume and pricing. When measured in fixed rates of foreign currency exchange, fixed currency sales increased 6% compared to the prior year. Acquisition adjusted fixed currency sales increased 6% compared to the prior year.

Gross Margin

Our reported gross margin was 41.2% of sales for 2018, compared to our 2017 reported gross margin of 41.7%. Excluding the impact of special (gains) and charges included in cost of sales from both 2018 and 2017, our adjusted gross margin was 41.3% in 2018 and 42.0% in 2017.

Operating Income

Reported operating income was flat at \$1.95 billion in 2018, compared to \$1.95 billion in 2017. Adjusted operating income, excluding the impact of special (gains) and charges, increased 5% in 2018. When measured in fixed rates of foreign currency exchange, adjusted fixed currency operating income also increased 5%.

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

Reported diluted EPS decreased 5% to \$4.88 in 2018 compared to \$5.12 in 2017. Special (gains) and charges had an impact on both years. 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. Special (gains) and charges in 2016 were driven primarily by Energy related charges, restructuring charges, other gains and charges and Venezuelan related actions. Adjusted diluted EPS, which exclude the impact of special (gains) and charges and discrete tax items increased to \$5.25 in 2018 compared to \$4.68 in 2017.

Balance Sheet

We remain committed to maintaining "A" range ratings metrics, supported by our current credit ratings of A-/Baa1 by the major ratings agencies. 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 2.3 and 2.4 for 2018 and 2017, 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 \$2.3 billion in 2018 compared to \$2.1 billion in 2017. 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 12% in December 2018 to an indicated annual rate of \$1.84 per share. The increase represents our 27th consecutive annual dividend rate increase and the 82nd 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

On January 1, 2018, we adopted Accounting Standards Committee 606 (ASC 606), Revenue from Contracts with Customers, which provides guidance on how revenue with customers should be recognized. For additional information on our adoption of this accounting standard, see Note 2.

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 840 Leases and recognized on a straight-line basis over the length of the lease contract.

Our sales 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 at the time the sale is recorded. We also record estimated reserves for product returns and credits at the time of sale and anticipated uncollectible accounts, as discussed below. Depending on market conditions, we may increase customer incentive offerings, which could reduce gross profit margins over the term of the incentive.

The new 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.

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 \$61 million and \$72 million, as of December 31, 2018 and 2017, respectively. These amounts include our allowance for sales returns and credits of \$17 million and \$15 million as of December 31, 2018 and 2017, respectively. Our bad debt expense as a percent of reported net sales was 0.1%, 0.1% and 0.2% in 2018, 2017 and 2016, respectively. 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. As with other companies engaged in similar manufacturing activities and providing similar products and services, 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 2018 and 2017, 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 2018, our weighted-average discount rate increased to 4.34% from 3.70% at year-end 2017. In determining our U.S. postretirement health care obligation for 2018, our weighted-average discount rate increased to 4.29% from 3.66% at year-end 2017.
- 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 7.75% for 2017 and 2018 and 7.25% for 2019.
- 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 2017, 2018 and 2019.
- For postretirement benefit measurement purposes as of December 31, 2018, the annual rates of increase in the per capita cost of covered health care were assumed to be 8.25% for pre-65 costs and 11.5% 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 2018, we utilized the most recent mortality table, MP-2018 projection scale (applied to the RP-2006 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 \$539 million as of December 31, 2018 from \$527 million as of December 31, 2017 (both before tax), primarily due to the amortization of prior period net actuarial losses.

The effect of a decrease in the discount rate or decrease in the expected return on assets assumption as of December 31, 2018, on the December 31, 2018 funded status and 2019 expense is shown below, assuming no changes in benefit levels and no amortization of gains or losses for our significant U.S. plans:

(millions)	Effect on U.S. Pension Plans		
	Assumption Change	Increase in Recorded Obligation	Higher 2019 Expense
Discount rate	-0.25 pts	\$59.3	\$5.1
Expected return on assets	-0.25 pts	N/A	5.2

(millions)	Effect on U.S. Postretirement Health Care Benefits Plans		
	Assumption Change	Increase in Recorded Obligation	Higher 2019 Expense
Discount rate	-0.25 pts	\$3.4	\$0.3
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 \$79 million and \$42 million as of December 31, 2018 and 2017, 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, any 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 initially recorded an estimate of the one-time transition tax in the fourth quarter of 2017 of \$160 million and in 2018 we recorded additional discrete expense of \$66 million, primarily due to the issuance of technical guidance, finalization of certain estimates as a result of filing the 2017 U.S. federal tax return and final balance sheet positions used in the calculation of the transition tax. As of December 31, 2018, we 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.

In January 2018, accounting guidance was issued requiring a company to make an accounting policy 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 its deferred taxes (the "deferred method"). We have elected the period cost method and have considered the estimated 2018 GILTI impact in our 2018 tax expense.

Additionally, proposed regulations were released during 2018. 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.

Prior to the enactment of the Tax Act, U.S. deferred income taxes had not been provided on certain unremitted foreign earnings that are considered permanently reinvested. Undistributed earnings of foreign subsidiaries are considered to have been reinvested indefinitely or are available for distribution with foreign tax credits available to offset the amount of applicable income tax and foreign withholding taxes that might be payable on earnings. As part of the Tax Act, we recorded a one-time transition tax on certain unremitted foreign earnings of foreign subsidiaries, which is payable over eight years. We will continue to assert permanent reinvestment of the undistributed earnings of international affiliates, and if our policy changes we would record applicable taxes.

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 federal income tax returns (Ecolab and Nalco) through 2014 and the years 2015 and 2016 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. The majority of our tax reserves are presented in the Consolidated Balance Sheet within other non-current liabilities. Our gross liability for uncertain tax positions was \$50 million and \$62 million as of December 31, 2018 and 2017, respectively.

For additional information on income taxes see Note 12.

Long-Lived Assets, Intangible Assets and Goodwill

Long-Lived and Amortizable Intangible Assets

We periodically review our long-lived and amortizable intangible assets, the net value of which was \$7.1 billion and \$7.0 billion as of December 31, 2018 and 2017, respectively, for impairment and to assess whether 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 base acquired in our recent 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. Our customer retention rate and history of maintaining long-term relationships with our significant customers are not expected to change in the future. Additionally, other less certain post-acquisition operational assumptions related to future capital investments and working capital, as well as the impact of discount rate assumptions, induce variability and uncertainty in the pattern of economic benefits of our acquired customer relationships. 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 \$7.1 billion and \$7.2 billion as of December 31, 2018 and 2017, 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 2018 impairment assessment, we completed our assessment for goodwill impairment across our eleven reporting units through a quantitative analysis, utilizing a discounted cash flow approach. The two-step quantitative process involved comparing the estimated fair value of each reporting unit to the reporting unit's carrying value, 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 2018 indicated the estimated fair value of each of our reporting units exceeded the unit's carrying amount by a significant margin. We will continue to assess the need to test our reporting units for impairment during interim periods between our scheduled annual assessments. 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, 2018 and 2017. 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 2018. Based on this testing, no adjustment to the carrying value was necessary. Additionally, no events during the second half of 2018 indicated a need to update our conclusions reached during the second quarter of 2018.

RESULTS OF OPERATIONS

Net Sales

(millions)	Percent Change				
	2018	2017	2016	2018	2017
Product and equipment sales	\$12,128.6	\$11,431.8	\$10,904.1		
Service and lease sales	2,539.6	2,404.1	2,247.7		
Reported GAAP net sales	\$14,668.2	\$13,835.9	\$13,151.8	6 %	5 %
Effect of foreign currency translation	378.1	394.1	391.7		
Non-GAAP fixed currency sales	\$15,046.3	\$14,230.0	\$13,543.5	6 %	5 %

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

(percent)	2018	2017
Volume	4%	3%
Price changes	2	1
Acquisition adjusted fixed currency sales change	6	4
Acquisitions & divestitures	0	1
Fixed currency sales change	6	5
Foreign currency translation	0	0
Reported GAAP net sales change	6%	5%

Cost of Sales (“COS”) and Gross Profit Margin (“Gross Margin”)

(millions/percent)	2018		2017		2016	
	COS	Gross Margin	COS	Gross Margin	COS	Gross Margin
Product and equipment cost of sales	\$7,078.5		\$6,576.9		\$6,153.3	
Service and lease cost of sales	1,547.4		1,487.3		1,380.6	
Reported GAAP COS and gross margin	\$8,625.9	41.2 %	\$8,064.2	41.7 %	\$7,533.9	42.7 %
Special (gains) and charges	9.3	0.1	44.0	0.3	66.0	0.5
Non-GAAP adjusted COS and gross margin	\$8,616.6	41.3 %	\$8,020.2	42.0 %	\$7,467.9	43.2 %

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 41.2%, 41.7%, and 42.7% for 2018, 2017, and 2016, respectively. Our 2018, 2017 and 2016 reported gross margins were negatively impacted by special (gains) and charges of \$9.3 million, \$44.0 million, and \$66.0 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 2018 adjusted gross margin was 41.3% compared against a 2017 adjusted gross margin of 42.0%. The decrease was driven primarily by higher delivered product costs more than offsetting the impact from increased pricing and cost savings.

Excluding the impact of special (gains) and charges, our adjusted gross margin was 42.0% and 43.2% for 2017 and 2016, respectively. The decrease was driven primarily by higher delivered product costs and an increase in Global Energy (which on average has a lower gross margin), which more than offset pricing and cost savings.

Selling, General and Administrative Expenses (“SG&A”)

(percent)	2018	2017	2016
SG&A Ratio	27.1 %	27.6 %	28.2 %

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

The decreased SG&A ratio comparing 2017 against 2016 was driven primarily by sales volume leverage and cost savings, which more than offset investments in the business and the impact of acquisitions.

Special (Gains) and Charges

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

(millions)	2018	2017	2016
Cost of sales			
Restructuring activities	\$12.1	\$4.6	\$(0.4)
Acquisition and integration activities	(0.6)	13.2	-
Energy related charges	-	-	62.6
Other	(2.2)	26.2	3.8
Subtotal	9.3	44.0	66.0
Special (gains) and charges			
Restructuring activities	89.4	39.9	(8.7)
Acquisition and integration activities	8.8	15.4	8.6
Gain on sale of business	-	(46.1)	-
Energy related charges	-	-	14.2
Venezuela related gain	-	(11.5)	(7.8)
Other	28.5	(1.4)	33.2
Subtotal	126.7	(3.7)	39.5
Operating income subtotal	136.0	40.3	105.5
Interest expense, net	0.3	21.9	-
Total special (gains) and charges	\$136.3	\$62.2	\$105.5

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 comprised of actions taken in 2018 related to Accelerate 2020 (described further below) and other actions taken in years prior to 2018. These activities have been included as a component of special (gains) and charges on the Consolidated Statement of Income. Restructuring liabilities have been classified as a component of both 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 systems investments and organizational changes. Subsequent to year-end, we raised our 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. We expect the expanded restructuring activities will be completed by the end of 2020, with anticipated costs of \$260 million (\$190 million after tax), or \$0.65 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. The restructuring actions are expected to result in approximately \$325 million of annual cost savings by 2021.

We recorded restructuring charges of \$104.6 million (\$79.6 million after tax), or \$0.27 per diluted share in 2018. The liability related to this Plan was \$63.9 million as of the end of the year.

Other Restructuring Activities

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 our 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 2018, net restructuring gains related to prior year plans were \$3.1 million (\$2.4 million after tax) or \$0.01 per diluted share. During 2017, we recorded restructuring charges of \$44.5 million (\$32.3 million after tax) or \$0.11 per diluted share. During 2016, we recorded restructuring gains of \$9.1 million (\$10.8 million after tax) or \$0.04 per diluted share. The restructuring liability balance for all plans commencing prior to 2018 was \$14.9 million and \$41.5 million as of December 31, 2018 and 2017, respectively. The reduction in liability was driven primarily by severance payments. The majority of pretax charges represent net cash expenditures which are 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 2018 related to restructuring plans commencing prior to 2018 were \$22.7 million.

Acquisition and integration related costs

Acquisition and integration costs reported in special (gains) and charges on the Consolidated Statement of Income in 2018 include \$8.8 million (\$6.1 million after tax) or \$0.02 per diluted share. Charges are primarily related to Laboratoires Anios ("Anios") integration costs, advisory and legal fees. 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 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 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.

During 2016, we incurred acquisition and integration charges of \$8.6 million (\$5.4 million after tax) or \$0.02 per diluted share primarily related to the Swisher acquisition.

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 has been included as a component of special (gains) and charges on the Consolidated Statement of Income.

Energy related charges

In 2016, excess oil supply pressure negatively impacted exploration and production investments in the energy industry, which directly impacted our operations and business outlook. Energy related charges reported in product and equipment cost of sales on the Consolidated Statement of Income in 2016 include \$62.6 million (\$40.7 million after tax), or \$0.14 per diluted share, comprised of inventory write-downs due to projects under construction. Energy related charges reported in special (gains) and charges on the Consolidated Statement of Income in 2016 include \$14.2 million (\$9.3 million after tax), or \$0.03 per diluted share, related to headcount reductions and other charges. No such charges occurred in 2017 or 2018.

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 and \$7.8 million (\$4.9 million after tax) or \$0.02 per diluted share in 2017 and 2016, respectively. No such gains occurred in 2018.

Other

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, a 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.

During 2016, we recorded other charges of \$37.0 million (\$22.7 million after tax), or \$0.08 per diluted share, primarily related to fixed asset impairments and litigation related charges and settlements. These charges have been included as a component of both cost of sales and special (gains) and charges on the Consolidated Statement of Income.

Interest expense, net

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)	2018	2017	2016	2018	2017
Reported GAAP operating income	\$1,947.0	\$1,950.1	\$1,870.2	(0)%	4 %
Special (gains) and charges	136.0	40.3	105.5		
Non-GAAP adjusted operating income	2,083.0	1,990.4	1,975.7	5	1
Effect of foreign currency translation	60.7	52.9	51.3		
Non-GAAP adjusted fixed currency operating income	\$2,143.7	\$2,043.3	\$2,027.0	5 %	1 %
(percent)	2018	2017	2016		
Reported GAAP operating income margin	13.3 %	14.1 %	14.2 %		
Non-GAAP adjusted operating income margin	14.2 %	14.4 %	15.0 %		
Non-GAAP adjusted fixed currency operating income margin	14.2 %	14.4 %	15.0 %		

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 remained flat when comparing 2018 to 2017 and increased 4% when comparing 2017 to 2016. Our reported operating income for 2018, 2017 and 2016 was impacted by special (gains) and charges. Excluding the impact of special (gains) and charges from all three years, 2018 adjusted operating income increased 5% when compared to 2017 adjusted operating income and 2017 adjusted operating income increased 1% when compared to 2016 adjusted operating income.

As shown in the previous table, foreign currency translation had a minimal impact on adjusted operating income growth for 2018 and 2017.

Other (Income) Expense

Other (income) expense relates to the income from the non-service components of pension cost which were \$79.9 million, \$67.3 million and \$43.8 million in 2018, 2017 and 2016, respectively. The increase in income is primarily due to expected returns on increased pension assets.

Interest Expense, Net

(millions)	2018	2017	2016
Reported GAAP interest expense, net	\$222.3	\$255.0	\$264.6
Special (gains) and charges	0.3	21.9	-
Non-GAAP adjusted interest expense, net	\$222.0	\$233.1	\$264.6

Reported net interest expense totaled \$222.3 million, \$255.0 million and \$264.6 million during 2018, 2017 and 2016 respectively.

During 2018, 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.

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 2018 adjusted net interest expense compared to 2017 was driven primarily by lower interest rates on debt. The decrease in our 2017 adjusted net interest expense compared to 2016 was driven primarily by an increased mix of lower cost Euro interest and lower interest rates on refinanced debt.

Provision for Income Taxes

The following table provides a summary of our tax rate:

(percent)	2018	2017	2016
Reported GAAP tax rate	20.2 %	13.8 %	24.4 %
Tax rate impact of:			
The Tax Act	(3.4)	8.7	0.0
Special (gains) and charges	0.3	(0.1)	1.0
Discrete tax items	3.2	1.4	(0.2)
Non-GAAP adjusted tax rate	20.3 %	23.8 %	25.2 %

Our reported tax rate was 20.2%, 13.8%, and 24.4% for 2018, 2017 and 2016, 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 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. 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.

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 considered the estimated 2018 GILTI impact in our 2018 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.

Our 2016 reported tax rate includes \$43.1 million of net tax benefits on special (gains) and charges and net expenses of \$3.9 million associated with discrete tax items. The net expenses related to discrete tax items in 2016 were driven primarily by recognizing adjustments from filing our 2015 U.S. federal income tax return, partially offset by settlement of international tax matters and remeasurement of certain deferred tax assets and liabilities resulting from the application of updated tax rates in international jurisdictions. Net expenses were also impacted by adjustments to deferred tax asset and liability positions and the release of reserves for uncertain tax positions due to the expiration of statute of limitations in international jurisdictions.

The change in our adjusted tax rate from 2016 to 2018 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

(millions)				Percent Change	
	2018	2017	2016	2018	2017
Reported GAAP net income attributable to Ecolab	\$1,429.1	\$1,504.6	\$1,229.0	(5)%	22 %
Adjustments:					
Special (gains) and charges, after tax	102.8	56.0	62.4		
Discrete tax net expense (benefit)	4.7	(184.2)	3.9		
Non-GAAP adjusted net income attributable to Ecolab	\$1,536.6	\$1,376.4	\$1,295.3	12 %	6 %

Diluted EPS

(dollars)				Percent Change	
	2018	2017	2016	2018	2017
Reported GAAP diluted EPS	\$ 4.88	\$ 5.12	\$ 4.14	(5)%	24 %
Adjustments:					
Special (gains) and charges	0.35	0.19	0.21		
Discrete tax net expense (benefit)	0.02	(0.63)	0.01		
Non-GAAP adjusted diluted EPS	\$ 5.25	\$ 4.68	\$ 4.37	12 %	7 %

Per share amounts do not necessarily sum due to rounding.

Currency translation had minimal impact on reported and adjusted diluted EPS when comparing 2018 to 2017 and when comparing 2017 to 2016.

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 used by management for 2018. 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 2018, 2017 and 2016 for our reportable segments are shown in the following tables.

Net Sales	Percent Change				
	2018	2017	2016	2018	2017
(millions)					
Global Industrial	\$5,462.4	\$5,106.8	\$4,891.1	7 %	4 %
Global Institutional	5,204.5	4,910.0	4,598.2	6	7
Global Energy	3,501.8	3,281.7	3,155.8	7	4
Other	877.6	931.5	898.4	(6)	4
Subtotal at fixed currency	15,046.3	14,230.0	13,543.5	6	5
Effect of foreign currency translation	(378.1)	(394.1)	(391.7)		
Total reported net sales	\$14,668.2	\$13,835.9	\$13,151.8	6 %	5 %

Operating Income	Percent Change				
	2018	2017	2016	2018	2017
(millions)					
Global Industrial	\$768.1	\$758.5	\$758.3	1 %	0 %
Global Institutional	1,026.9	979.8	949.5	5	3
Global Energy	358.5	336.1	349.9	7	(4)
Other	161.3	142.5	141.6	13	1
Corporate	(307.1)	(213.9)	(277.8)		
Subtotal at fixed currency	2,007.7	2,003.0	1,921.5	0	4
Effect of foreign currency translation	(60.7)	(52.9)	(51.3)		
Total reported operating income	\$1,947.0	\$1,950.1	\$1,870.2	0 %	4 %

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

Net Sales	Year ended December 31					
	2018			2017		
	Fixed Currency	Impact of Acquisitions and Divestitures	Acquisition Adjusted	Fixed Currency	Impact of Acquisitions and Divestitures	Acquisition Adjusted
(millions)						
Global Industrial	\$5,462.4	\$(83.8)	\$5,378.6	\$5,106.8	\$(27.9)	\$5,078.9
Global Institutional	5,204.5	(62.6)	5,141.9	4,910.0	(0.1)	4,909.9
Global Energy	3,501.8	(0.5)	3,501.3	3,281.7	(26.6)	3,255.1
Other	877.6	(42.3)	835.3	931.5	(154.1)	777.4
Subtotal at fixed currency	15,046.3	(189.2)	14,857.1	14,230.0	(208.7)	14,021.3
Effect of foreign currency translation	(378.1)			(394.1)		
Total reported net sales	\$14,668.2			\$13,835.9		

Operating Income	Year ended December 31					
	2018			2017		
	Fixed Currency	Impact of Acquisitions and Divestitures	Acquisition Adjusted	Fixed Currency	Impact of Acquisitions and Divestitures	Acquisition Adjusted
(millions)						
Global Industrial	\$768.1	\$(3.7)	\$764.4	\$758.5	\$0.4	\$758.9
Global Institutional	1,026.9	(3.8)	1,023.1	979.8	(0.1)	979.7
Global Energy	358.5	1.9	360.4	336.1	(0.3)	335.8
Other	161.3	(4.2)	157.1	142.5	(8.7)	133.8
Corporate	(171.1)	-	(171.1)	(173.6)	-	(173.6)
Non-GAAP adjusted fixed currency operating income	2,143.7	(9.8)	2,133.9	2,043.3	(8.7)	2,034.6
Special (gains) and charges	136.0			40.3		
Subtotal at fixed currency	2,007.7			2,003.0		
Effect of foreign currency translation	(60.7)			(52.9)		
Total reported operating income	\$1,947.0			\$1,950.1		

Global Industrial

	2018	2017	2016
Sales at fixed currency (millions)	\$5,462.4	\$5,106.8	\$4,891.1
Sales at public currency (millions)	5,286.5	4,918.0	4,695.2
Volume	4 %	2 %	
Price changes	2 %	1 %	
Acquisition adjusted fixed currency sales change	6 %	3 %	
Acquisitions and divestitures	1 %	1 %	
Fixed currency sales change	7 %	4 %	
Foreign currency translation	1 %	0 %	
Public currency sales change	7 %	5 %	
Operating income at fixed currency (millions)	\$768.1	\$758.5	\$758.3
Operating income at public currency (millions)	736.9	727.9	718.1
Fixed currency operating income change	1 %	0 %	
Fixed currency operating income margin	14.1 %	14.9 %	15.5 %
Acquisition adjusted fixed currency operating income change	1 %	0 %	
Acquisition adjusted fixed currency operating income margin	14.2 %	14.9 %	*
Public currency operating income change	1 %	1 %	

* Not meaningful

Amounts do not necessarily sum due to rounding.

Net Sales

Fixed currency sales growth for Global Industrial in both 2018 and 2017 was driven by volume gains and pricing. At a regional level, the 2018 sales increase was impacted by good growth in North America and Europe. Regional results for 2017 were impacted by good growth in Latin America, North America and Greater China.

At an operating segment level, **Water** fixed currency sales increased 7% in 2018 (increase of 6% acquisition adjusted). Light industry sales growth was led by innovative technology and service offerings. Heavy industry sales benefitted from sales force investments and improved market conditions. Mining sales were led by new business wins. Fixed currency sales increased 5% in 2017 (increase of 3% acquisition adjusted) led by Light industry sales growth. **Food & Beverage** 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. Fixed currency sales increased 4% in 2017, benefiting from new business wins and pricing, which more than offset generally flat industry trends. **Paper** fixed currency sales increased 11% (6% acquisition adjusted) in 2018 driven by business wins and pricing. Fixed currency sales increased 3% in 2017. **Textile Care** fixed currency sales were increased 1% in 2018. Fixed currency sales increased 2% in 2017, benefiting from new customer accounts in Europe. **Life Sciences** fixed currency sales increased 14% in 2018 (12% acquisition adjusted). Good growth from business wins and pricing execution in both the pharmaceutical and personal care markets. Fixed currency sales increased 7% in 2017 as business wins and pricing drove sales growth in both the pharmaceutical and personal care markets.

Operating Income

Fixed currency operating income for Global Industrial increased in 2018 and was flat in 2017 when compared to prior periods. Fixed currency operating income margins decreased in 2018 and 2017. Acquisitions had minimal impact on both the fixed currency operating income and fixed currency operating income margins in 2018.

Acquisition adjusted fixed currency operating income margins decreased 0.7 percentage points in 2018, negatively impacted by approximately 2.8 percentage points related to higher delivered product costs and investments in the business. The favorable impact of pricing and sales volume gains added approximately 2.1 percentage points during 2018. Acquisition adjusted fixed currency operating income margins decreased in 2017 compared to 2016, negatively impacted by higher delivered product costs and investments in the business, partially offset by favorable impact of pricing and volume gains along with the impact of cost savings initiatives.

Global Institutional

	2018	2017	2016
Sales at fixed currency (millions)	\$5,204.5	\$4,910.0	\$4,598.2
Sales at public currency (millions)	5,098.5	4,776.2	4,482.9
Volume	3 %	1 %	
Price changes	2 %	2 %	
Acquisition adjusted fixed currency sales change	5 %	3 %	
Acquisitions and divestitures	1 %	4 %	
Fixed currency sales change	6 %	7 %	
Foreign currency translation	1 %	(0)%	
Public currency sales change	7 %	7 %	
Operating income at fixed currency (millions)	\$1,026.9	\$979.8	\$949.5
Operating income at public currency (millions)	1,010.6	964.3	945.9
Fixed currency operating income change	5 %	3 %	
Fixed currency operating income margin	19.7 %	20.0 %	20.6 %
Acquisition adjusted fixed currency operating income change	4 %	1 %	
Acquisition adjusted fixed currency operating income margin	19.9 %	20.0 %	*
Public currency operating income change	5 %	2 %	

* Not meaningful

Amounts do not necessarily sum due to rounding.

Net Sales

Fixed currency sales growth for Global Institutional in both 2018 and 2017 benefited from volume growth, acquisitions and pricing gains. At a regional level, the 2018 and 2017 sales increases were led by good growth in North America and Europe.

At an operating segment level, **Institutional** 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. Fixed currency sales increased 1% in 2017 (increase of 2% acquisition adjusted). **Specialty** fixed currency sales increased 8% in 2018, led primarily from strong ongoing business and new account wins. Fixed currency sales increased 7% in 2017, led primarily by new account wins and growth in global quick service accounts, leveraging generally modest industry trends. **Healthcare** 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. Fixed currency sales increased 42% in 2017 (increase of 3%, when adjusted for the Anios acquisition), with modest growth for Healthcare in North America and Europe.

Operating Income

Fixed currency operating income for our Global Institutional segment increased in both 2018 and 2017 when compared to prior periods. Fixed currency operating income margins declined in both 2018 and 2017 as pricing and sales volume gains were offset by investments in the business and higher delivered product costs.

Acquisition adjusted fixed currency operating income margins decreased 0.1 percentage points during 2018. Investments in the business, including innovative digital technologies and higher delivered product costs negatively impacted margins by 1.9 percentage points. The favorable impact of sales volume gains, pricing and cost savings added approximately 1.9 percentage points. Acquisition adjusted fixed currency operating income margins decreased in 2017, negatively impacted by business investments and higher delivered product costs, partially offset by favorable impact of pricing gains, product mix and sales volume.

Global Energy

	2018	2017	2016
Sales at fixed currency (millions)	\$3,501.8	\$3,281.7	\$3,155.8
Sales at public currency (millions)	3,421.1	3,230.0	3,092.9
Volume	5 %	6 %	
Price changes	<u>2 %</u>	<u>(1)%</u>	
Acquisition adjusted fixed currency sales change	8 %	5 %	
Acquisitions and divestitures	<u>(1)%</u>	<u>(1)%</u>	
Fixed currency sales change	7 %	4 %	
Foreign currency translation	<u>(1)%</u>	<u>0 %</u>	
Public currency sales change	6 %	4 %	
Operating income at fixed currency (millions)	\$358.5	\$336.1	\$349.9
Operating income at public currency (millions)	345.4	327.7	341.0
Fixed currency operating income change	7 %	(4)%	
Fixed currency operating income margin	10.2 %	10.2 %	11.1 %
Acquisition adjusted fixed currency operating income change	7 %	1 %	
Acquisition adjusted fixed currency operating income margin	10.3 %	10.3 %	*
Public currency operating income change	5 %	(4)%	

* Not meaningful

Amounts do not necessarily sum due to rounding.

Net Sales

Fixed currency sales for Global Energy in 2018 and 2017 recorded strong growth in the well stimulation business. Production business sales showed a modest increase in 2018 and were primarily driven by increased North America activity. Sales in our downstream business had moderate growth driven by international sales. Fixed currency sales for Global Energy in 2017 had a strong growth in the well stimulation business, while the production business showed a modest decline, as growth in North America was offset by international markets. Sales in our downstream business rose moderately.

Operating Income

Fixed currency operating income for Global Energy increased during 2018 and decreased during 2017 as compared to the prior year. Acquisitions had a minimal impact on the fixed currency operating income in 2018 and a negative impact in 2017. Acquisitions had a negative impact on the fixed currency operating income margins for both 2018 and 2017.

Acquisition adjusted fixed currency operating income margins remained flat in 2018 and decreased in 2017. Sales volume gains and pricing favorably impacted margins by approximately 2.7 percentage points during 2018. These gains were equally offset by higher delivered product costs and investments in the business. Higher delivered product costs and business investments negatively impacted 2017, partially offset by cost savings.

Other

	2018	2017	2016
Sales at fixed currency (millions)	\$877.6	\$931.5	\$898.4
Sales at public currency (millions)	862.1	911.7	880.8
Volume	6 %	4 %	
Price changes	2 %	2 %	
Acquisition adjusted fixed currency sales change	7 %	6 %	
Acquisitions and divestitures	(13)%	(2)%	
Fixed currency sales change	(6)%	4 %	
Foreign currency translation	0 %	(0)%	
Public currency sales change	(5)%	4 %	
Operating income at fixed currency (millions)	\$161.3	\$142.5	\$141.6
Operating income at public currency (millions)	158.7	140.3	139.2
Fixed currency operating income change	13 %	1 %	
Fixed currency operating income margin	18.4 %	15.3 %	15.8 %
Acquisition adjusted fixed currency operating income change	17 %	5 %	
Acquisition adjusted fixed currency operating income margin	18.8 %	17.2 %	*
Public currency operating income change	13 %	1 %	

* Not meaningful
Amounts do not necessarily sum due to rounding.

Net Sales

Fixed currency sales for Other decreased in 2018, due to the divestiture of Equipment Care in the fourth quarter of 2017. At a regional level, acquisition and divestiture adjusted sales growth was primarily driven by North America. Fixed currency sales increased in 2017 driven by volume increases and pricing gains. At a regional level, the 2017 sales increase was led by good growth in North America.

At an operating segment level, **Pest Elimination** fixed currency sales increased 13% in 2018 and 8% in 2017 led by sales to food beverage and hospitality, with good growth in restaurants. Acquisition adjusted fixed currency sales increased 7% in 2018 led by sales growth in the food & beverage and hospitality markets. **CTG** fixed currency sales increased 10% in 2018.

Operating Income

Acquisition adjusted fixed currency operating income margins in Other increased 1.6 percentage points in 2018. The favorable impact of sales volume and pricing increases added 2.1 percentage points to growth and field investments negatively impacted comparable margins by approximately 0.2 percentage points. Acquisition adjusted fixed currency operating income margins decreased in 2017, negatively impacted by Field investments and other cost increases, offsetting the benefit of pricing volume and mix gains.

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 \$20.1 billion as of December 31, 2018, compared to total assets of \$20.0 billion as of December 31, 2017.

Total liabilities were \$12.0 billion as of December 31, 2018, compared to total liabilities of \$12.3 billion as of December 31, 2017. Total debt was \$7.0 billion as of December 31, 2018 and \$7.3 billion as of December 31, 2017. 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.

	2018	2017	2016
(ratio)			
Net debt to EBITDA	2.3	2.4	2.3
(millions)			
Total debt	\$7,045.2	\$7,322.7	\$6,687.0
Cash	114.7	211.4	327.4
Net debt	\$6,930.5	\$7,111.3	\$6,359.6
Net income including non-controlling interest	\$1,440.3	\$1,518.6	\$1,246.5
Provision for income taxes	364.3	243.8	402.9
Interest expense, net	222.3	255.0	264.6
Depreciation	621.3	585.7	561.0
Amortization	317.0	307.6	289.7
EBITDA	\$2,965.2	\$2,910.7	\$2,764.7

Cash Flows

Operating Activities

	Dollar Change				
(millions)	2018	2017	2016	2018	2017
Cash provided by operating activities	\$2,277.7	\$2,091.3	\$1,939.7	\$186.4	\$151.6

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 2016 to 2018 was impacted by fluctuations in accounts receivable, inventories and accounts payable ("working capital"), the combination of which increased \$192 million, \$56 million and \$35 million in 2018, 2017 and 2016 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:

	Dollar Change				
(millions)	2018	2017	2016	2018	2017
Pensions and postretirement plan contributions	\$60.0	\$144.1	\$211.8	\$(84.1)	\$(67.7)
Restructuring payments	57.9	39.2	51.6	18.7	(12.4)
Income tax payments	395.2	402.8	359.1	(7.6)	43.7
Interest payments	206.4	239.3	267.0	(32.9)	(27.7)

Investing Activities

	Dollar Change				
(millions)	2018	2017	2016	2018	2017
Cash used for investing activities	\$(1,030.0)	\$(1,727.0)	\$(773.6)	\$697.0	\$(953.4)

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 2018, 2017 and 2016 was \$221 million, \$870 million and \$49 million, respectively. Our acquisitions and divestitures across 2018, 2017 and 2016 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 \$847 million, \$869 million and \$757 million in 2018, 2017 and 2016, respectively.

Financing Activities

	Dollar Change				
(millions)	2018	2017	2016	2018	2017
Cash used for financing activities	\$(1,172.7)	\$(522.7)	\$(868.2)	\$(650.0)	\$345.5

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 \$562 million, \$600 million, and \$740 million of shares in 2018, 2017 and 2016, respectively. These amounts include \$300 million of shares repurchased in 2017 and 2016 through our Accelerated Stock Repurchase ("ASR") programs. See Note 10 for further information regarding our ASR programs.

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)	2018	2017	2016	2018	2017
Net issuances of commercial paper and notes payable	\$341.8	\$(43.7)	\$(606.4)	\$385.5	\$562.7
Long-term debt borrowings	-	1,309.4	2,390.0	(1,309.4)	(1,080.6)
Long-term debt repayments	(551.6)	(799.0)	(1,569.6)	247.4	770.6

In December 2018, we increased our indicated annual dividend rate by 12%. This represents the 27th consecutive year we have increased our dividend. We have paid dividends on our common stock for 82 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
2018	\$0.410	\$0.410	\$0.410	\$0.460	\$1.690
2017	0.370	0.370	0.370	0.410	1.520
2016	0.350	0.350	0.350	0.370	1.420

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, 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, 2017, we had \$211 million of cash and cash equivalents on hand, of which \$151 million was held outside of the U.S.

As of December 31, 2018 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 \$141.4 million (€125.0 million) of commercial paper outstanding under the Euro commercial paper program and \$24.0 million outstanding under the U.S. commercial paper program. There were no borrowings under our credit facility as of December 31, 2018 or 2017. As of December 31, 2018, both programs were rated A-2 by Standard & Poor's, P-2 by Moody's and F-2 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 \$150 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, 2018, 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 (stable 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, 2018 are summarized in the following table:

(millions)	Total	Payments Due by Period			
		Less Than 1 Year	2-3 Years	4-5 Years	More Than 5 Years
Notes payable	\$ 177	\$ 177	\$ -	\$ -	\$ -
One-time transition tax	156	11	25	26	94
Long-term debt	6,701	400	1,318	1,145	3,838
Capital lease obligations	2	1	1	-	-
Operating leases	634	172	249	109	104
Interest*	2,470	222	424	303	1,521
Total	\$ 10,140	\$ 983	\$ 2,017	\$ 1,583	\$ 5,557

* Interest on variable rate debt was calculated using the interest rate at year-end 2018.

As of December 31, 2018, our gross liability for uncertain tax positions was \$50 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 2019. 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 \$48 million in 2019. 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

Other than operating leases, as discussed further in Note 13, we do not participate in off-balance sheet financing arrangements. Through the normal course of business, we have established various joint ventures that have not been consolidated within our financial statements as we are not 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, 2018, 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, 2018, we had interest rate swaps outstanding with notional values of \$400 million.

See Note 8 for further information on our hedging activity.

Based on a sensitivity analysis (assuming a 10% adverse 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 \$258 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 23% of our sales are generated from our Global Energy segment, the results of which, as noted further below, are subject to volatility in the oil and gas commodity markets.

During 2018, oil industry drilling and production activity showed improved volumes over 2017, led by strong gains in North America drilling and production activity over the past year and related recovering capital expenditure trends, while international activity remained soft. 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 outperform in the current market. As such, we continue to remain confident in the long-term growth prospects of the segment.

Global Economies

Approximately 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 2018, sales in Argentina represented less than 1% of our consolidated sales. Assets held in Argentina at the end of 2018 represented less than 1% of our consolidated assets.

Brexit Referendum

On March 29, 2017, the United Kingdom (“U.K.”) government gave formal notice to the European Union (“EU”) to begin the process of negotiating the U.K.’s exit (“Brexit”) from the EU. The effects of Brexit will depend on any agreements the U.K. makes to retain access to the EU markets either during a transitional period or more permanently. The negotiations might also impact various tax reliefs and exemptions that apply to transactions between the U.K. and EU. In the longer term, any impact from Brexit on our U.K. operations will depend, in part, on the outcome of tariff, trade, regulatory, and other negotiations. We will continue to monitor the status of tax law changes and tax treaty negotiations at the U.K. and EU.

During 2018, net sales of our U.K. operations were approximately 2% of our consolidated net sales.

NEW ACCOUNTING PRONOUNCEMENTS

Information regarding new accounting pronouncements is included in Note 2.

SUBSEQUENT EVENTS

Acquisitions

Subsequent to year-end, we closed on the acquisition of Bioquell PLC, a leading provider of hydrogen peroxide vapor bio-decontamination systems and services for the life sciences and healthcare industries and acquired Lobster Ink, a leading provider of end-to-end online customer training solutions. We also entered into various purchase and sale agreements which are expected to close in the first quarter of 2019. None of the agreements are significant to the consolidated financial statements, individually or in the aggregate.

Upstream Energy Spin-off

Ecolab intends to pursue, subject to the receipt of approval by Ecolab’s Board of Directors and any regulatory approvals, a plan to separate and spin-off the Upstream group of Ecolab’s Global Energy segment (the Upstream Business) through a series of tax-efficient transactions (collectively, the Spin-off). Under the plan, if effectuated, Ecolab’s shareholders would own 100% of the common stock of a new corporation that owns the Upstream Business. The Spin-off is expected to be completed in 2020 and is intended to qualify as a tax-free distribution to Ecolab shareholders for U.S. federal income tax purposes.

In anticipation of and to facilitate the Spin-off, Ecolab is currently planning for the internal separation of the Upstream Business through a series of transactions that are intended to be tax-efficient from a U.S. federal income tax perspective. The Spin-off is expected to consist of two phases: (i) a series of internal transactions undertaken by Ecolab and its direct and indirect subsidiaries to separate the Upstream Business from Ecolab’s other businesses, including multiple distributions intended to qualify as tax-free distributions for U.S. federal income tax purposes under Section 355 of the Internal Revenue Code (collectively, the Internal Separations), followed by (ii) an external distribution by Ecolab of the common stock of a newly-formed corporation owning the Upstream Business to current Ecolab shareholders owning Ecolab shares in a distribution that is intended to qualify as tax-free for U.S. federal income tax purposes under Section 355 of the Internal Revenue Code.

The Internal Separations are currently expected to occur in the United States and in (or involving entities domiciled in) various other jurisdictions, including (but not limited to) Luxembourg, the Netherlands, Jersey, Saudi Arabia, the United Kingdom, Singapore and Switzerland. In particular, the Ecolab subsidiaries (which shall also include any of their successors and transferees) that are anticipated to be distributing corporations in connection with the Internal Separations include: Ecolab Lux 9 S.à r.l., Ecolab NL 11 B.V., Nalco Overseas Holding B.V., Nalco Holding B.V., Ecolab Lux 11 S.à r.l., Ecolab Lux 10 S.à r.l., Ecolab U.S. 2 Inc., Ecolab Lux 7 S.à r.l., Ecolab CH 2 GmbH, Ecolab NL 3 B.V., Ecolab Lux 1 S.à r.l., Ecolab Lux 2 S.à r.l., Nalco Saudi Co. Ltd., Nalco Gulf Limited, Nalco Manufacturing Ltd., Ecolab Pte. Ltd., Ecolab USA Inc., Nalco Holding Company and Nalco U.S. 2 Inc. In addition, certain Ecolab subsidiaries (or their respective successors and transferees) listed on Exhibit (21.1) may also be distributing corporations in connection with the Internal Separations.

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 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 2018. 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, 2018.

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, 2018 as stated in their report which is included herein.



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



Daniel J. Schmechel
Chief Financial Officer and Treasurer

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, 2018 and 2017, 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, 2018, 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, 2018, 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, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 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, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

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.



PricewaterhouseCoopers LLP
Minneapolis, Minnesota
March 1, 2019

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

CONSOLIDATED STATEMENT OF INCOME

(millions, except per share amounts)

	2018	2017	2016
Product and equipment sales	\$12,128.6	\$11,431.8	\$10,904.1
Service and lease sales	2,539.6	2,404.1	2,247.7
Net sales	14,668.2	13,835.9	13,151.8
Product and equipment cost of sales	7,078.5	6,576.9	6,153.3
Service and lease cost of sales	1,547.4	1,487.3	1,380.6
Cost of sales (including special charges (a))	8,625.9	8,064.2	7,533.9
Selling, general and administrative expenses	3,968.6	3,825.3	3,708.2
Special (gains) and charges	126.7	(3.7)	39.5
Operating income	1,947.0	1,950.1	1,870.2
Other (income) expense	(79.9)	(67.3)	(43.8)
Interest expense, net (including special charges (b))	222.3	255.0	264.6
Income before income taxes	1,804.6	1,762.4	1,649.4
Provision for income taxes	364.3	243.8	402.9
Net income including noncontrolling interest	1,440.3	1,518.6	1,246.5
Net income attributable to noncontrolling interest	11.2	14.0	17.5
Net income attributable to Ecolab	\$1,429.1	\$1,504.6	\$1,229.0
Earnings attributable to Ecolab per common share			
Basic	\$ 4.95	\$ 5.20	\$ 4.20
Diluted	\$ 4.88	\$ 5.12	\$ 4.14
Weighted-average common shares outstanding			
Basic	288.6	289.6	292.5
Diluted	292.8	294.0	296.7

(a) Cost of sales includes special charges of \$9.3 in 2018, \$44.0 in 2017, and \$66.0 in 2016, which is included in product and equipment cost of sales.

(b) Interest expense, net includes special charges of \$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)	2018	2017	2016
Net income including noncontrolling interest	\$1,440.3	\$1,518.6	\$1,246.5
Other comprehensive income (loss), net of tax			
Foreign currency translation adjustments			
Foreign currency translation	(223.3)	208.0	(230.4)
Gain (loss) on net investment hedges	57.5	(109.7)	(2.5)
	(165.8)	98.3	(232.9)
Derivatives and hedging instruments	28.4	(17.9)	(17.5)
Pension and postretirement benefits			
Current period net actuarial loss	(37.8)	(33.4)	(102.3)
Pension and postretirement prior period service (costs) and benefits	(2.3)	(0.5)	7.7
Amortization of net actuarial loss and prior service costs included in net periodic pension and postretirement costs	13.2	24.7	20.2
Pension and postretirement benefits changes	44.9	-	33.9
	18.0	(9.2)	(40.5)
Subtotal	(119.4)	71.2	(290.9)
Total comprehensive income, including noncontrolling interest	1,320.9	1,589.8	955.6
Comprehensive income attributable to noncontrolling interest	10.1	15.7	16.2
Comprehensive income attributable to Ecolab	\$1,310.8	\$1,574.1	\$939.4

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

CONSOLIDATED BALANCE SHEET

(millions, except per share amounts)

	2018	2017
ASSETS		
Current assets		
Cash and cash equivalents	\$114.7	\$211.4
Accounts receivable, net	2,662.5	2,571.4
Inventories	1,546.4	1,446.5
Other current assets	354.1	365.0
Total current assets	4,677.7	4,594.3
Property, plant and equipment, net	3,836.0	3,707.1
Goodwill	7,078.0	7,167.1
Other intangible assets, net	3,797.7	4,017.6
Other assets	685.1	477.4
Total assets	\$20,074.5	\$19,963.5
LIABILITIES AND EQUITY		
Current liabilities		
Short-term debt	\$743.6	\$564.4
Accounts payable	1,255.6	1,177.1
Compensation and benefits	579.7	549.4
Income taxes	100.6	183.6
Other current liabilities	1,006.1	1,000.7
Total current liabilities	3,685.6	3,475.2
Long-term debt	6,301.6	6,758.3
Postretirement health care and pension benefits	944.3	1,025.5
Deferred income taxes	764.6	635.4
Other liabilities	324.8	415.3
Total liabilities	12,020.9	12,309.7
Commitments and contingencies (Note 15)		
Equity (a)		
Common stock	357.0	354.7
Additional paid-in capital	5,633.2	5,435.7
Retained earnings	8,909.5	8,011.6
Accumulated other comprehensive loss	(1,761.7)	(1,643.4)
Treasury stock	(5,134.8)	(4,575.0)
Total Ecolab shareholders' equity	8,003.2	7,583.6
Noncontrolling interest	50.4	70.2
Total equity	8,053.6	7,653.8
Total liabilities and equity	\$20,074.5	\$19,963.5

(a) Common stock, 800.0 shares authorized, \$1.00 par value, 287.7 shares outstanding at December 31, 2018 and 289.3 shares outstanding at December 31, 2017. 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)	2018	2017	2016
OPERATING ACTIVITIES			
Net income including noncontrolling interest	\$1,440.3	\$1,518.6	\$1,246.5
Adjustments to reconcile net income to cash provided by operating activities:			
Depreciation	621.3	585.7	561.0
Amortization	317.0	307.6	289.7
Deferred income taxes	85.1	(353.5)	(90.6)
Share-based compensation expense	94.4	90.5	85.7
Excess tax benefits from share-based payment arrangements	-	-	(43.6)
Pension and postretirement plan contributions	(60.0)	(144.1)	(211.8)
Pension and postretirement plan expense	31.9	36.9	54.1
Restructuring charges, net of cash paid	43.5	5.2	(60.5)
Gain on sale of businesses	-	(50.6)	(0.5)
Asset charges and write-downs	-	15.1	65.9
Other, net	24.0	37.4	14.2
Changes in operating assets and liabilities, net of effect of acquisitions:			
Accounts receivable	(164.1)	(91.5)	0.9
Inventories	(141.1)	(85.5)	18.8
Other assets	(80.7)	(48.9)	(34.9)
Accounts payable	113.5	121.1	(55.1)
Other liabilities	(47.4)	147.3	99.9
Cash provided by operating activities	2,277.7	2,091.3	1,939.7
INVESTING ACTIVITIES			
Capital expenditures	(847.1)	(868.6)	(756.8)
Property and other assets sold	30.0	10.7	30.5
Acquisitions and investments in affiliates, net of cash acquired	(229.8)	(989.2)	(49.5)
Divestiture of businesses	9.2	118.8	0.9
Settlement of net investment hedges	14.1	2.1	1.3
Other, net	(6.4)	(0.8)	-
Cash used for investing activities	(1,030.0)	(1,727.0)	(773.6)
FINANCING ACTIVITIES			
Net issuances (repayments) of commercial paper and notes payable	341.8	(43.7)	(606.4)
Long-term debt borrowings	-	1,309.4	2,390.0
Long-term debt repayments	(551.6)	(799.0)	(1,569.6)
Reacquired shares	(562.4)	(600.3)	(739.6)
Dividends paid	(496.5)	(448.7)	(427.5)
Exercise of employee stock options	114.5	83.8	76.8
Excess tax benefits from share-based payment arrangements	-	-	43.6
Acquisition related liabilities and contingent consideration	(10.1)	(8.5)	(35.5)
Other, net	(8.4)	(15.7)	-
Cash used for financing activities	(1,172.7)	(522.7)	(868.2)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	7.6	(10.6)	(10.3)
Increase (decrease) in cash, cash equivalents and restricted cash	82.6	(169.0)	287.6
Cash, cash equivalents and restricted cash, beginning of period (a)	211.4	380.4	92.8
Cash, cash equivalents and restricted cash, end of period (b)	\$294.0	\$211.4	\$380.4
SUPPLEMENTAL CASH FLOW INFORMATION			
Income taxes paid	\$395.2	\$402.8	\$359.1
Interest paid	206.4	239.3	267.0

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

(a) Beginning of period 2018, 2017, and 2016 included restricted cash of \$0, \$53.0 and \$0, respectively.

(b) Restricted cash was \$179.3, \$0 and \$53.0 as of December 31, 2018, 2017 and 2016, respectively.

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

CONSOLIDATED STATEMENT OF EQUITY

(millions, except shares and per share amounts)	Ecolab Shareholders					Ecolab Shareholders' Equity	Non-Controlling Interest	Total Equity
	Common Stock	Additional Paid-in Capital	Retained Earnings	OCI (Loss)	Treasury Stock			
Balance, December 31, 2015	\$350.3	\$5,086.1	\$6,160.3	\$(1,423.3)	\$(3,263.5)	\$6,909.9	\$70.5	\$6,980.4
New accounting guidance adoption (a)			(29.3)			(29.3)		(29.3)
Net income			1,229.0			1,229.0	17.5	1,246.5
Comprehensive income (loss) activity				(289.6)		(289.6)	(1.3)	(290.9)
Cash dividends declared (b)			(414.9)			(414.9)	(16.9)	(431.8)
Stock options and awards	2.3	200.2			3.2	205.7		205.7
Reacquired shares		(15.5)			(724.1)	(739.6)		(739.6)
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 (c)			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 (d)			(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

- (a) Upon adoption of Topic 606, Revenue from Contracts with Customers and the related amendments, the Company changed its accounting policy for revenue recognition and has established deferred revenue for service revenues with the cumulative effect reflected as an adjustment to retained earnings.
- (b) Dividends declared per common share were \$1.690, \$1.520 and \$1.420 in 2018, 2017 and 2016, respectively.
- (c) 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.
- (d) 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.

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

COMMON STOCK ACTIVITY

Year ended December 31	2018		2017		2016	
	Common Stock	Treasury Stock	Common Stock	Treasury Stock	Common Stock	Treasury Stock
Shares, beginning of year	354,715,896	(65,393,098)	352,607,741	(60,782,667)	350,339,820	(54,372,729)
Stock options	1,833,004	38,679	1,714,214	41,767	1,778,821	58,969
Stock awards	409,200	18,481	393,941	55,431	489,100	14,291
Reacquired shares	-	(3,908,041)	-	(4,707,629)	-	(6,483,198)
Shares, end of year	356,958,100	(69,243,979)	354,715,896	(65,393,098)	352,607,741	(60,782,667)

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.

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 policies, are reported using the equity method of accounting. The cost method of accounting is used in circumstances where the Company has no substantial influence over the investee, and the investment has no easily 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 and 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 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 the use of differing 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, the different 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 include separately providing for customer receivables based on specific circumstances and credit conditions, and when it is deemed probable that the balance is uncollectible. 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 \$17 million, \$15 million and \$14 million as of December 31, 2018, 2017, and 2016, respectively. Returns and credit activity is recorded directly to sales as a reduction.

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

(millions)	2018	2017	2016
Beginning balance	\$71.5	\$67.6	\$75.3
Bad debt expense	15.7	17.1	20.1
Write-offs	(23.6)	(15.7)	(24.6)
Other (a)	(3.0)	2.5	(3.2)
Ending balance	\$60.6	\$71.5	\$67.6

(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% and 39% of consolidated inventories as of December 31, 2018 and 2017, respectively. 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, dishwashing 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 of development or purchase of computer software for internal use. 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 15 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 \$621 million, \$586 million and \$561 million for 2018, 2017 and 2016, respectively.

During 2018, the Company impaired certain assets related to Accelerate 2020. During 2017, the Company impaired certain assets related to a portion of one of its businesses. During 2016, the Company impaired certain assets related to a product line within one of its U.S. plants. 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 2018, the Company completed its annual assessment for goodwill impairment across its eleven reporting units through a quantitative analysis, utilizing a discounted cash flow approach, which incorporates assumptions regarding future growth rates, terminal values, and discount rates. The two-step quantitative process involved comparing the estimated fair value of each reporting unit to the reporting unit's carrying value, 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 2018 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 2018 that indicated a need to update the Company's conclusions reached during the second quarter of 2018.

If circumstances change significantly, the Company would also 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, 2016	\$2,585.0	\$590.7	\$3,093.6	\$113.7	\$6,383.0
Segment change (a)	(71.7)	-	-	71.7	-
December 31, 2016 revised	\$2,513.3	\$590.7	\$3,093.6	\$185.4	\$6,383.0
Current year business combinations (b)	123.4	403.7	8.1	63.9	599.1
Prior year business combinations (c)	(0.2)	-	0.3	-	0.1
Dispositions	-	-	-	(42.6)	(42.6)
Effect of foreign currency translation	88.8	32.6	101.7	4.4	227.5
December 31, 2017	\$2,725.3	\$1,027.0	\$3,203.7	\$211.1	\$7,167.1
Current year business combinations (b)	71.6	12.4	-	-	84.0
Prior year business combinations (c)	(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

- Relates to establishment of the Colloidal Technologies Group ("CTG") operating segment, which is also a reporting unit. Goodwill was allocated to CTG based on a fair value allocation. The CTG operating segment is included in Other. CTG was previously reported in the Water reporting unit, which is aggregated and reported in the Global Industrial reportable segment. See Note 18 for further information.
- For 2018, the Company does not expect any of the goodwill related to businesses acquired to be tax deductible. For 2017, \$79.2 million of the goodwill related to businesses acquired is expected to be tax deductible.
- 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 2018, the Company completed its annual test for indefinite life intangible asset impairment using a relief from royalty method of assessment, 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 2018 indicated a need to update the Company's conclusions reached during the second quarter of 2018. 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. The fair value of identifiable intangible assets is estimated based upon discounted future cash flow projections and 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, 2018 and 2017.

The weighted-average useful life by type of amortizable asset at December 31, 2018 is as follows:

(years)	
Customer relationships	14
Trademarks	14
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 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 that 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)	
2016	\$ 290
2017	308
2018	317
2019	310
2020	303
2021	298
2022	292
2023	284

Long-Lived Assets

The Company periodically reviews its long-lived and amortizable intangible assets for impairment and assesses whether 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.

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).

In January 2018, the Financial Accounting Standards Board (FASB) issued guidance stating that a company must 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 its deferred taxes (the "deferred method"). Ecolab has elected the period cost method and considered the estimated 2018 GILTI impact in its 2018 tax expense.

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 attributed 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.

During the first quarter of 2017, the Company adopted the accounting guidance issued in March 2016 that amends certain aspects of share-based compensation for employees, including the accounting for income taxes, forfeitures, and statutory tax withholding requirements, as well as classifications on the Consolidated Statement of Cash Flows. Under the new guidance, all excess tax benefits or deficiencies are to be recognized prospectively as discrete income tax items on the Consolidated Statement of Income, while previous guidance required realized excess tax benefits or deficiencies to be recognized in additional paid-in capital. The Company recorded \$28.1 million and \$39.7 million of excess tax benefits during 2018 and 2017, respectively. The extent of excess tax benefits is subject to variation in stock price and stock option exercises. Adoption of the accounting standard also eliminated the requirement that excess tax benefits be realized before they can be recognized, and as a result, the Company recorded a \$1.9 million cumulative-effect adjustment for previously unrecognized excess tax benefits.

The Company's adoption also resulted in associated excess tax benefits being classified as an operating activity in the statement of cash flows prospectively beginning January 1, 2017 with no changes to the prior year. Based on the adoption methodology applied, employee taxes paid remain classified as a financing activity on the statement of cash flows, and the statement of cash flows classification of prior periods has not changed.

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.

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 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 840 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, that 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 sales 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. The Company records estimated reductions to revenue for customer programs and incentive offerings, including pricing arrangements, promotions and other volume-based incentives at the time the sale is recorded. 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)	2018	2017	2016
Net income attributable to Ecolab	\$1,429.1	\$1,504.6	\$1,229.0
Weighted-average common shares outstanding			
Basic	288.6	289.6	292.5
Effect of dilutive stock options and units	4.2	4.4	4.2
Diluted	292.8	294.0	296.7
Basic EPS	\$ 4.95	\$ 5.20	\$ 4.20
Diluted EPS	\$ 4.88	\$ 5.12	\$ 4.14
Anti-dilutive securities excluded from the computation of diluted EPS	2.9	3.4	3.6

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

New Accounting Pronouncements

Standards that are not yet adopted:

Standard	Date of Issuance	Description	Required Date of Adoption	Effect on the Financial Statements
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 ASU should be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption. The Company is currently evaluating the impact of adoption.
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	Entities are required to apply the disclosure amendments on a retrospective basis to all periods presented. The Company is currently evaluating the impact of adoption.
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	The Company is currently evaluating the impact of adoption and accounting policy elections required to be made.
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. Adoption of the ASU is not expected to have a material impact on the Company's financial statements.
Credit Losses ASUs: 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	Adoption of the standard may change how the allowance for trade and other receivables is calculated. The Company is currently evaluating the impact of adoption.
Derivatives and Hedging ASUs: 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 the ASU is not expected to have a material impact on the Company's financial statements.

Standard	Date of Issuance	Description	Required Date of Adoption	Effect on the Financial Statements
Lease ASUs: 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).

(a) As part of adopting the new lease standard, the Company has implemented a global lease accounting software, which is designed to facilitate adoption and reporting in accordance with the new standard. The Company is substantially complete in accumulating leases within the software and designing future processes for adherence to ongoing reporting requirements. Adoption of the standard will result in the recognition of right-of-use assets and lease liabilities for operating leases of approximately \$550 million as of January 1, 2019. Adoption of the standard is not expected to have a material impact on consolidated net earnings.

The Company will elect the prospective transition method with the effects of initially applying the new standard to be recognized as a cumulative effect adjustment to the opening balance of retained earnings in the period of adoption. This adjustment to retained earnings is not expected to be material. Prior reporting periods will be recorded in accordance with the guidance in place at that time. The Company will also elect the package of three practical expedients permitted under the transition guidance within the new standard, which among other things, allows the Company to carryforward the historical lease classification. The Company will also elect the hindsight and land easement practical expedients.

The Company will make an accounting policy election to not apply the recognition requirements of the new standard to leases with terms of 12 months or less and which do not include an option to purchase the underlying assets which is reasonably certain of exercise. Those lease payments will continue to be recognized in the Consolidated Statement of Income on a straight-line basis over the lease term.

Lastly, the Company will elect, for certain asset classes, the lessor practical expedient to not separate nonlease and lease components and account for those components as a single component. These asset classes are not expected to be material.

Standards that were adopted:

Standard	Date of Issuance	Description	Date of Adoption	Effect on the Financial Statements
ASU 2017-09 - Compensation - Stock Compensation (Topic 718): Scope of Modification Accounting	May 2017	Clarifies the definition of what's considered a substantive modification related to a change in terms or conditions of a share-based payment award and when it's appropriate to apply modification accounting. The current definition of "modification" was too broad, resulting in diverse interpretations of what was considered a substantive modification.	January 1, 2018	Adoption of the guidance did not have a material impact on the Company's financial statements.
ASU 2017-05 - Other Income - Gains and Losses from the Derecognition of Nonfinancial Assets (Topic 610-20): Clarifying the Scope of Asset Derecognition Guidance and Accounting for Partial Sales of Nonfinancial Assets	February 2017	Clarifies the scope of guidance on nonfinancial asset derecognition (ASC 610-20) including the accounting for partial sales of nonfinancial assets. The ASU defines "in-substance nonfinancial asset" and clarifies the derecognition of all businesses should be accounted for in accordance with derecognition and deconsolidation guidance in 810-10.	January 1, 2018	Adoption of the guidance did not have a material impact on the Company's financial statements.
ASU 2017-01 - Business Combinations (Topic 805): Clarifying the Definition of a Business	January 2017	Clarifies the definition of a business and provides guidance on whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses.	January 1, 2018	Adoption of the guidance did not have a material impact on the Company's financial statements.
ASU 2016-16 - Income Taxes (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory	October 2016	Simplifies the guidance on the accounting for the income tax consequences of intra-entity transfers of assets other than inventory (e.g. intellectual property).	January 1, 2018	During the first quarter of 2018, the Company adopted the guidance that requires recognition of the income tax effects of intercompany sales and transfers of assets, other than inventory, in the period in which the transfer occurs. Upon adoption of the standard, only the income tax effects of intercompany transfers of inventory are deferred. The standard was adopted using the modified retrospective approach with a cumulative-effective adjustment of \$43.6 million to opening retained earnings on the date of adoption. Income tax effects of intra-entity inventory transfers will continue to be deferred until the inventory is sold.
ASU 2016-15 - Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments	August 2016	Provides guidance on how certain cash receipts and cash payments are presented and classified in the statement of cash flow.	January 1, 2018	Adoption of the guidance did not have a material impact on the Company's financial statements and elected to account for distributions received from equity method investees using the nature of distribution approach accounting policy election.

ASU 2014-09 – Revenue from Contracts with Customers

On January 1, 2018, the Company retrospectively adopted Accounting Standards Codification Topic 606 Revenue from Contracts with Customers and the related amendments ("the new revenue standard"). The new revenue standard was applied to all periods presented and the cumulative effect of applying the standard is recognized at the beginning of 2016. The Company identified additional performance obligations primarily related to performing service activities, which were explicitly or implicitly included in contracts with customers. These performance obligations, when aggregated with service revenue currently reported, represent more than 10% of sales. Upon adoption of the new standard, service and lease revenue are reported separately from product and sold equipment revenue. Concurrent with the adoption of the new revenue standard, the Company reclassified certain costs to cost of sales from selling, general and administrative expenses, to align the cost of providing the service with the recognition of service revenue. The Company recorded a reduction to opening retained earnings of \$29.3 million, net of tax, as of January 1, 2016 due to the impact of adopting the new revenue standard, with the impact primarily related to deferring service revenue.

ASU 2017-07 – Compensation - Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and the Net Periodic Postretirement Benefit Cost

On January 1, 2018, the Company retrospectively adopted guidance relating to the presentation of the components of net periodic benefit costs for pension and other post-retirement benefits within the Consolidated Statement of Income. Under the new guidance, the non-service cost components of net periodic benefit cost are presented in other (income) expense, while the service cost component will continue to be recorded with compensation cost in cost of sales and selling, general and administrative expenses. The Company elected to use the practical expedient that allows entities to estimate the amount for comparative periods using the information previously disclosed in the pension and postretirement health care benefits footnote. As a result, the Company has changed its accounting principle, and revised prior period presentation related to the presentation of the non-service cost components.

The following table presents the effect of the adoptions of the revenue recognition and pension standards on the Company's Consolidated Statement of Income:

(millions, except per share amounts)

	Year ended December 31			
	2017 Reported	Revenue Standard Adoption	Pension Standard Adoption	2017 Revised
Net sales	\$13,838.3	\$(13,838.3)	\$-	\$-
Product and equipment sales	-	11,431.8	-	11,431.8
Service and lease sales	-	2,404.1	-	2,404.1
Total net sales	13,838.3	(2.4)	-	13,835.9
Cost of sales	7,405.1	(7,405.1)	-	-
Product and equipment cost of sales	-	6,573.3	3.6	6,576.9
Service and lease cost of sales	-	1,486.4	0.9	1,487.3
Total cost of sales (including special charges (a))	7,405.1	654.6	4.5	8,064.2
Selling, general and administrative expenses	4,417.1	(654.6)	62.8	3,825.3
Special (gains) and charges	(3.7)	-	-	(3.7)
Operating income	2,019.8	(2.4)	(67.3)	1,950.1
Other (income) expense	-	-	(67.3)	(67.3)
Interest expense, net	255.0	-	-	255.0
Income before income taxes	1,764.8	(2.4)	-	1,762.4
Provision for income taxes	242.4	1.4	-	243.8
Net income including noncontrolling interest	1,522.4	(3.8)	-	1,518.6
Net income attributable to noncontrolling interest	14.0	-	-	14.0
Net income attributable to Ecolab	\$1,508.4	\$(3.8)	\$-	\$1,504.6
Earnings attributable to Ecolab per common share				
Basic	\$ 5.21	\$ (0.01)	\$ -	\$ 5.20
Diluted	\$ 5.13	\$ (0.01)	\$ -	\$ 5.12

(a) Cost of sales includes special charges of \$44.0 million in 2017, which is included in product and equipment cost of sales.

(millions, except per share amounts)

	Year ended December 31			
	2016 Reported	Revenue Standard Adoption	Pension Standard Adoption	2016 Revised
Net sales	\$13,152.8	\$(13,152.8)	\$-	\$-
Product and equipment sales	-	10,904.1	-	10,904.1
Service and lease sales	-	2,247.7	-	2,247.7
Total net sales	13,152.8	(1.0)	-	13,151.8
Cost of sales	6,898.9	(6,898.9)	-	-
Product and equipment cost of sales	-	6,148.8	4.5	6,153.3
Service and lease cost of sales	-	1,379.9	0.7	1,380.6
Total cost of sales (including special charges (a))	6,898.9	629.8	5.2	7,533.9
Selling, general and administrative expenses	4,299.4	(629.8)	38.6	3,708.2
Special (gains) and charges	39.5	-	-	39.5
Operating income	1,915.0	(1.0)	(43.8)	1,870.2
Other (income) expense	-	-	(43.8)	(43.8)
Interest expense, net	264.6	-	-	264.6
Income before income taxes	1,650.4	(1.0)	-	1,649.4
Provision for income taxes	403.3	(0.4)	-	402.9
Net income including noncontrolling interest	1,247.1	(0.6)	-	1,246.5
Net income attributable to noncontrolling interest	17.5	-	-	17.5
Net income attributable to Ecolab	\$1,229.6	\$(0.6)	\$-	\$1,229.0
Earnings attributable to Ecolab per common share				
Basic	\$ 4.20	\$ -	\$ -	\$ 4.20
Diluted	\$ 4.14	\$ -	\$ -	\$ 4.14

(a) Cost of sales includes special charges of \$66.0 million in 2016, which is included in product and equipment cost of sales.

The following table presents the effect of the adoption of the new revenue standard on the selected accounts which were impacted in the Consolidated Balance Sheet:

	Year Ended December 31		
	2017 Reported	Revenue Standard Adoption	2017 Revised
ASSETS			
Current assets			
Accounts receivable, net	\$2,574.1	\$(2.7)	\$2,571.4
Inventories	1,445.9	0.6	1,446.5
Total current assets	4,596.4	(2.1)	4,594.3
Other assets	474.2	3.2	477.4
Total assets	\$19,962.4	\$1.1	\$19,963.5
LIABILITIES AND EQUITY			
Current liabilities			
Other current liabilities	957.3	43.4	1,000.7
Total current liabilities	3,431.8	43.4	3,475.2
Deferred income taxes	642.8	(7.4)	635.4
Total liabilities	12,273.7	36.0	12,309.7
Equity			
Retained earnings	8,045.4	(33.8)	8,011.6
Accumulated other comprehensive loss (a)	(1,642.3)	(1.1)	(1,643.4)
Total Ecolab shareholders' equity	7,618.5	(34.9)	7,583.6
Total equity	7,688.7	(34.9)	7,653.8
Total liabilities and equity	\$19,962.4	\$1.1	\$19,963.5

(a) Revenue recognition adjustments had a nominal impact on foreign currency translation within accumulated other comprehensive loss. These revisions have been reflected within the Statement of Comprehensive Income.

ASU 2016-18 – Statement of Cash Flows (Topic 230): Restricted Cash

During the first quarter of 2018, the Company adopted the accounting guidance issued in 2016 that requires companies to show the changes in the total of cash, cash equivalents, restricted cash and restricted cash equivalents in the statement of cash flows. The Company's restricted cash is primarily associated with acquisitions, and the related escrow payments. As a result of the new guidance, the Company has updated the policy so restricted cash will no longer be shown as a transfer on the statement of cash flows, and a reconciliation of restricted cash will be added to the statement of cash flows.

The following table presents the effect of the adoptions of the restricted cash and revenue recognition standards on selected accounts in the Consolidated Statement of Cash Flows:

(millions)	Year ended December 31			
	2017 Reported	Restricted Cash Standard Adoption	Revenue Standard Adoption	2017 Revised
OPERATING ACTIVITIES				
Net income including noncontrolling interest	\$1,522.4	\$-	\$(3.8)	\$1,518.6
Adjustments to reconcile net income to cash provided by operating activities:				
Deferred income taxes	(354.5)	-	1.0	(353.5)
Changes in operating assets and liabilities, net of effect of acquisitions:				
Accounts receivable	(91.8)	-	0.3	(91.5)
Other liabilities	144.8	-	2.5	147.3
Cash provided by operating activities	2,091.3	-	-	2,091.3
INVESTING ACTIVITIES				
Restricted cash activity	53.8	(53.8)	-	-
Cash used for investing activities	(1,673.2)	(53.8)	-	(1,727.0)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(11.4)	0.8	-	(10.6)
Increase (decrease) in cash, cash equivalents and restricted cash	(116.0)	(53.0)	-	(169.0)
Cash, cash equivalents and restricted cash, beginning of period	327.4	53.0	-	380.4
Cash, cash equivalents and restricted cash, end of period	\$211.4	\$-	\$-	\$211.4

(millions)	Year ended December 31			
	2016 Reported	Restricted Cash Standard Adoption	Revenue Standard Adoption	2016 Revised
OPERATING ACTIVITIES				
Net income including noncontrolling interest	\$1,247.1	\$-	\$(0.6)	\$1,246.5
Adjustments to reconcile net income to cash provided by operating activities:				
Deferred income taxes	(90.6)	-	-	(90.6)
Changes in operating assets and liabilities, net of effect of acquisitions:				
Accounts receivable	0.9	-	-	0.9
Other liabilities	99.3	-	0.6	99.9
Cash provided by operating activities	1,939.7	-	-	1,939.7
INVESTING ACTIVITIES				
Restricted cash activity	(55.9)	55.9	-	-
Cash used for investing activities	(829.5)	55.9	-	(773.6)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(7.4)	(2.9)	-	(10.3)
Increase (decrease) in cash, cash equivalents and restricted cash	234.6	53.0	-	287.6
Cash, cash equivalents and restricted cash, beginning of period	92.8	-	-	92.8
Cash, cash equivalents and restricted cash, end of period	\$327.4	\$53.0	\$-	\$380.4

3. SPECIAL (GAINS) AND CHARGES

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

(millions)	2018	2017	2016
Cost of sales			
Restructuring activities	\$12.1	\$4.6	\$(0.4)
Acquisition and integration activities	(0.6)	13.2	-
Energy related charges	-	-	62.6
Other	(2.2)	26.2	3.8
Subtotal	9.3	44.0	66.0
Special (gains) and charges			
Restructuring activities	89.4	39.9	(8.7)
Acquisition and integration activities	8.8	15.4	8.6
Gain on sale of business	-	(46.1)	-
Energy related charges	-	-	14.2
Venezuela related gain	-	(11.5)	(7.8)
Other	28.5	(1.4)	33.2
Subtotal	126.7	(3.7)	39.5
Operating income subtotal	136.0	40.3	105.5
Interest expense, net	0.3	21.9	-
Total special (gains) and charges	\$136.3	\$62.2	\$105.5

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 are comprised of actions taken in 2018 related to Accelerate 2020 and other actions taken in years prior to 2018. These activities have been included as a component of special (gains) and charges on the Consolidated Statement of Income. Restructuring liabilities have been classified as a component of both 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. Subsequent to year-end, 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 now expects the restructuring activities will be completed by the end of 2020, with anticipated costs of \$260 million (\$190 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 \$104.6 million (\$79.6 million after tax) in 2018. The liability related to this Plan was \$63.9 million as of the end of the year.

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

Other Restructuring Activities

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 2018, net restructuring gains related to prior year plans were \$3.1 million (\$2.4 million after tax). During 2017, the Company recorded restructuring charges of \$44.5 million (\$32.3 million after tax). During 2016, the Company recorded restructuring gains of \$9.1 million (\$10.8 million after tax). The restructuring liability balance for all plans commencing prior to 2018 was \$14.9 million and \$41.5 million as of December 31, 2018 and 2017, respectively. The reduction in liability was driven primarily by severance payments. The majority of pretax charges represent net cash expenditures which are 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 2018 related to restructuring plans commencing prior to 2018 were \$22.7 million.

Acquisition and integration related costs

Acquisition and integration costs reported in special (gains) and charges on the Consolidated Statement of Income in 2018 include \$8.8 million (\$6.1 million after tax). Charges are primarily related to Laboratoires Anios ("Anios") integration costs, advisory and legal fees. 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.

During 2016, the Company incurred acquisition and integration charges of \$8.6 million (\$5.4 million after tax) primarily related to the Swisher acquisition.

Further information related to the Company's acquisitions is included in Note 4.

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.

Energy related charges

In 2016, excess oil supply pressure negatively impacted exploration and production investments in the energy industry, which directly impacted the Company's operations and business outlook. Energy related charges reported in product and equipment cost of sales on the Consolidated Statement of Income in 2016 include \$62.6 million (\$40.7 million after tax), comprised of inventory write-downs due to decline in activity and replacement costs, and fixed asset charges due to a reduction of certain operations and abandonment of certain projects under construction. Energy related charges reported in special (gains) and charges on the Consolidated Statement of Income in 2016 include \$14.2 million (\$9.3 million after tax) related to headcount reductions and other charges. No such charges occurred in 2017 or 2018.

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) and \$7.8 million (\$4.9 million after tax) in 2017 and 2016, respectively. No such gains occurred in 2018.

Other

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.

During 2016, the Company recorded other charges of \$37.0 million (\$22.7 million after tax), primarily related to fixed asset impairments and litigation related charges and settlements. These charges have been included as a component of both cost of sales and special (gains) and charges on the Consolidated Statement of Income.

Interest Expense, net

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 acquisitions that align with its strategic business objectives. The assets and liabilities of the acquired entities 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 2018, 2017 and 2016 were not significant to the Company's consolidated financial statements; therefore, pro forma financial information is not presented.

Other Acquisitions

The components of the cash paid for other acquisitions, excluding the Anios transaction (as further disclosed below), for transactions during 2018, 2017 and 2016, are shown in the following table.

(millions)	2018	2017	2016
Net tangible assets acquired and equity method investments	\$30.1	\$29.8	\$46.9
Identifiable intangible assets			
Customer relationships	101.5	67.0	2.6
Trademarks	3.9	2.5	-
Non-compete agreements	2.6	0.2	-
Other technology	6.5	7.6	1.1
Total intangible assets	114.5	77.3	3.7
Goodwill	81.9	87.4	7.3
Total aggregate purchase price	226.5	194.5	57.9
Acquisition related liabilities and contingent consideration	(1.5)	5.6	27.1
Net cash paid for acquisitions, including acquisition related liabilities and contingent consideration	\$225.0	\$200.1	\$85.0

The 2018 acquisition related liability is related to holdback liabilities and contingent considerations. 2017 and 2016 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, 13, 12, and 4 years as of December 31, 2018, 2017 and 2016, respectively.

2018 Activity

In November 2018, the Company acquired a food and beverage business which provides a range of cleaning and disinfection products for the food processing, food service and beverage sectors, as well as for the institutional and hospitality sectors. Also, during 2018, the Company acquired a water business which provides a range of services to Nalco Water institutional customers. These acquired businesses became part of the Company's Global Industrial reportable segment. These acquisitions have been accounted for using the acquisition method of accounting, which requires, among other things, that assets acquired and liabilities assumed be recognized at fair value as of the acquisition date. Certain estimated values are not yet finalized and are subject to change.

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.

2016 Activity

In 2016, the Company made an equity method investment in a global leader in the design and engineering of complex and comprehensive water treatment solutions that improve water quality and reduce net water usage which became part of the Company's Global Industrial reportable segment. The Company also acquired certain assets of an oilfield chemical distributor which became part of the Company's Global Energy reportable segment.

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 2018, 2017 or 2016.

Subsequent Event Activity

Subsequent to year-end, the Company closed on the acquisition of Bioquell PLC, a leading provider of hydrogen peroxide vapor bio-decontamination systems and services for the life sciences and healthcare industries and acquired Lobster Ink, a leading provider of end-to-end online customer training solutions. The Company entered into various purchase and sale agreements which are expected to close in the first quarter of 2019. None of the agreements are significant to the consolidated financial statements, individually or in the aggregate.

Subsequent to year-end, the Company announced its intent to pursue a plan to separate and spin-off the Upstream group of the Global Energy segment (the Upstream Business) through a series of tax-efficient transactions (collectively, the Spin-off). Under the plan, if effectuated, shareholders would own 100% of the common stock of a new corporation that owns the Upstream Business. The Spin-off is expected to be completed in 2020 and is intended to qualify as a tax-free distribution to Ecolab shareholders for U.S. federal income tax purposes.

5. BALANCE SHEET INFORMATION

(millions)	December 31 2018	December 31 2017
Accounts receivable, net		
Accounts receivable	\$2,723.1	\$2,642.9
Allowance for doubtful accounts	(60.6)	(71.5)
Total	\$2,662.5	\$2,571.4
Inventories		
Finished goods	\$1,016.9	\$974.9
Raw materials and parts	525.6	438.7
Inventories at FIFO cost	1,542.5	1,413.6
FIFO cost to LIFO cost difference	3.9	32.9
Total	\$1,546.4	\$1,446.5
Other current assets		
Prepaid assets	\$132.1	\$153.5
Taxes receivable	144.2	129.2
Derivative assets	42.8	28.8
Other	35.0	53.5
Total	\$354.1	\$365.0
Property, plant and equipment, net		
Land	\$214.5	\$224.1
Buildings and leasehold improvements	1,279.4	1,207.4
Machinery and equipment	2,313.7	2,280.9
Merchandising and customer equipment	2,565.5	2,399.4
Capitalized software	666.2	585.8
Construction in progress	400.2	438.7
	7,439.5	7,136.3
Accumulated depreciation	(3,603.5)	(3,429.2)
Total	\$3,836.0	\$3,707.1
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	3,649.3	3,620.3
Trademarks	384.9	380.6
Patents	470.2	462.7
Other technology	242.8	232.6
	4,747.2	4,696.2
Accumulated amortization		
Customer relationships	(1,604.0)	(1,403.8)
Trademarks	(175.2)	(147.6)
Patents	(207.3)	(187.9)
Other technology	(193.0)	(169.3)
	(2,179.5)	(1,908.6)
Net intangible assets subject to amortization	2,567.7	2,787.6
Total	\$3,797.7	\$4,017.6
Other assets		
Deferred income taxes	\$105.1	\$105.4
Pension	39.0	41.7
Derivative asset	11.8	-
Restricted cash	179.3	-
Other	349.9	330.3
Total	\$685.1	\$477.4

(millions)	December 31 2018	December 31 2017
Other current liabilities		
Discounts and rebates	\$291.3	\$267.2
Dividends payable	132.4	118.6
Interest payable	44.5	50.7
Taxes payable, other than income	116.9	129.9
Derivative liabilities	20.1	62.2
Restructuring	73.7	36.0
Contract liability	75.8	79.0
Other	251.4	257.1
Total	\$1,006.1	\$1,000.7
Accumulated other comprehensive loss		
Unrealized gain (loss) on derivative financial instruments, net of tax	\$2.0	\$(26.4)
Unrecognized pension and postretirement benefit expense, net of tax	(518.9)	(555.8)
Cumulative translation, net of tax	(1,244.8)	(1,061.2)
Total	\$(1,761.7)	\$(1,643.4)

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, 2018 and 2017:

(millions)	2018		2017	
	Carrying Value	Average Interest Rate	Carrying Value	Average Interest Rate
Short-term debt				
Commercial paper	\$165.4	0.18 %	\$-	-
Notes payable	176.8	1.47 %	14.7	2.77 %
Long-term debt, current maturities	401.4		549.7	
Total	\$743.6		\$564.4	

Line of Credit

As of December 31, 2018, 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, 2018 and 2017.

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, 2018, the Company had \$141.4 million (€125.0 million) of commercial paper outstanding under its Euro program and \$24.0 million outstanding under its U.S. program. As of December 31, 2017, the Company had no commercial paper outstanding under either program.

As of December 31, 2018, the Company's short-term borrowing program was rated A-2 by Standard & Poor's, P-2 by Moody's and F-2 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, 2018 and 2017, the Company had \$176.8 million and \$14.7 million, respectively, outstanding under these credit lines. Approximately \$575 million and \$643 million of these credit lines were available for use as of December 31, 2018 and 2017, 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, 2018 and 2017:

(millions)	Maturity by Year	2018			2017		
		Carrying Value	Stated Interest Rate	Effective Interest Rate	Carrying Value	Stated Interest Rate	Effective Interest Rate
Long-term debt							
Public and 144A notes (2018 principal amount)							
Three year 2015 senior notes (\$0 million)	2018	\$-	- %	- %	\$299.9	1.55 %	1.94 %
Three year 2016 senior notes (\$400 million)	2019	399.7	2.00 %	3.24 %	396.1	2.00 %	2.26 %
Five year 2015 senior notes (\$300 million)	2020	299.5	2.25 %	2.79 %	299.1	2.25 %	2.79 %
Ten year 2011 senior notes (\$1.02 billion)	2021	1,017.6	4.35 %	4.43 %	1,016.6	4.35 %	4.45 %
Five year 2017 senior notes (\$500 million)	2022	496.9	2.38 %	2.55 %	496.3	2.38 %	2.55 %
Seven year 2016 senior notes (\$400 million)	2023	398.0	3.25 %	3.49 %	397.5	3.25 %	3.49 %
Seven year 2016 senior notes (€575 million)	2024	644.1	1.00 %	1.09 %	676.6	1.00 %	1.17 %
Ten year 2015 senior notes (€575 million)	2025	646.3	2.63 %	2.94 %	679.4	2.63 %	2.85 %
Ten year 2016 senior notes (\$750 million)	2026	743.8	2.70 %	2.93 %	742.8	2.70 %	2.93 %
Ten year 2017 144A notes (\$500 million)	2027	-	- %	- %	494.7	3.25 %	3.36 %
Ten year 2017 senior notes (\$500 million)	2027	494.8	3.25 %	3.37 %	-	- %	- %
Thirty year 2011 senior notes (\$458 million)	2041	451.6	5.50 %	5.56 %	451.3	5.50 %	5.60 %
Thirty year 2016 senior notes (\$250 million)	2046	246.1	3.70 %	3.76 %	246.0	3.70 %	3.76 %
Thirty year 2017 144A notes (\$700 million)	2047	-	- %	- %	607.8	3.95 %	4.14 %
Thirty year 2017 senior notes (\$700 million)	2047	609.0	3.95 %	4.14 %	-	- %	- %
Private notes (2018 principal amount)							
Series A private placement senior notes (\$250 million)	2018	-	- %	- %	248.5	3.69 %	5.16 %
Series B private placement senior notes (\$250 million)	2023	249.4	4.32 %	4.36 %	249.3	4.32 %	4.36 %
Capital lease obligations and other							
Total debt		6,703.0			7,308.0		
Long-term debt, current maturities		(401.4)			(549.7)		
Total long-term debt		\$6,301.6			\$6,758.3		

Public and 144A Notes

In 2017, the Company completed a private offering of \$825 million of debt securities consisting of a \$500 million aggregate principal ten year fixed rate note with a coupon rate of 3.25% ("New 10-year Notes") and a \$325 million aggregate principal thirty year fixed rate note with a coupon rate of 3.95% ("New 30-year Notes" and, together with the New 10-year Notes, "144A Notes"). Immediately following the offering, the Company completed a private offering to exchange a portion of the outstanding senior notes due 2041 ("Old 30-year Notes"), for \$375 million of the New 30-year Notes. In connection with the exchange offering, \$292 million of Old 30-year Notes were validly tendered and subsequently cancelled.

During the first quarter of 2018, pursuant to a registration rights agreement pertaining to the 144A Notes, the Company filed a registration statement regarding an offer to exchange each series of the 144A Notes for new issues of notes registered under the U.S. Securities Act of 1933, as amended. The registration statement was declared effective, and the Company commenced the exchange offer and all of the 144A Notes were exchanged for new notes. The terms of each series of the new notes are substantially identical to the terms of the applicable series of 144A Notes, except that the new notes are registered as mentioned above and the transfer restrictions and registration rights and related special interest provisions applicable to the 144A Notes do not apply to the new notes.

The New 30-year Notes bear a lower fixed coupon rate while requiring a higher principal repayment on an extended maturity date, compared with the Old 30-year Notes that were exchanged. There were no other significant changes to the terms between the Old 30-year Notes and the New 30-year Notes. The exchange was accounted for as a debt modification, and there were no cash payments to or cash receipts from the note holders as a result of the exchange. Existing deferred financing costs associated with the Old Notes, as well as discounts associated with the New Notes aggregating \$87 million, are being accreted over the term of the New Notes and recorded as interest expense.

In December 2017, the Company completed a partial retirement on \$230 million of the 4.35% senior note due 2021 which was accounted for as a debt extinguishment. The payout premium of \$15.7 million was expensed immediately and is reflected as a financing cash flow activity.

In August 2017, the Company issued a \$500 million aggregate principal five year fixed rate note with a coupon rate of 2.375%. The proceeds were used to repay a portion of the Company's outstanding commercial paper and for general corporate purposes.

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, 2018.

As of December 31, 2018, the aggregate annual maturities of long-term debt for the next five years were:

(millions)	
2019	\$ 401
2020	301
2021	1,018
2022	497
2023	648

Net Interest Expense

Interest expense and interest income incurred during 2018, 2017 and 2016 were as follows:

(millions)	2018	2017	2016
Interest expense	\$237.2	\$274.6	\$285.4
Interest income	(14.9)	(19.6)	(20.8)
Interest expense, net	\$222.3	\$255.0	\$264.6

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:

		December 31, 2018			
(millions)		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	-

		December 31, 2017			
(millions)		Carrying Amount	Fair Value Measurements		
			Level 1	Level 2	Level 3
Assets					
Foreign currency forward contracts		\$45.8	\$-	\$45.8	\$-
Liabilities					
Foreign currency forward contracts		153.1	-	153.1	-
Interest rate swap agreements		4.2	-	4.2	-

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 obligations are recognized and measured at fair value at the acquisition date and thereafter until settlement. Contingent consideration is classified within level 3 as the underlying fair value is measured based on the probability-weighted present value of the consideration expected to be transferred. The consideration expected to be transferred is based on the 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 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, 2018		December 31, 2017	
	Carrying Amount	Fair Value	Carrying Amount	Fair Value
Long-term debt, including current maturities	\$6,703.0	\$6,844.7	\$7,308.0	\$7,716.0

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. Hedge ineffectiveness, if any, is recorded in earnings.

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 international 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 of the Company's outstanding derivatives.

(millions)

	Asset Derivatives		Liability Derivatives	
	December 31 2018	December 31 2017	December 31 2018	December 31 2017
(millions)				
Derivatives designated as hedging instruments				
Foreign currency forward contracts	\$40.4	\$19.6	\$10.2	\$125.2
Interest rate swap agreements	-	-	0.2	4.2
Derivatives not designated as hedging instruments				
Foreign currency forward contracts	31.9	26.2	30.9	27.9
Gross value of derivatives	72.3	45.8	41.3	157.3
Gross amounts offset in the Consolidated Balance Sheet	(17.7)	(17.0)	(17.7)	(17.0)
Net value of derivatives	\$54.6	\$28.8	\$23.6	\$140.3

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

	Notional Values	
	December 31 2018	December 31 2017
(millions)		
Foreign currency forward contracts	\$ 6,226	\$ 5,593
Interest rate agreements	400	950

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, management fee and other payments. These forward contracts are designated as cash flow hedges. The effective portions of 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.

The Company occasionally enters into treasury lock and forward starting interest rate swap agreements to manage interest rate exposure. During 2016 and 2015, the Company entered into and subsequently closed a series of treasury lock and forward starting interest rate swap agreements, in conjunction with its public debt issuances. The agreements were designated and effective as cash flow hedges of the expected interest payments related to the anticipated future debt issuances. Amounts recorded in AOCI are recognized as interest expense over the remaining life of the notes as the forecasted interest transactions occur.

The effective portion of gains and losses recognized into AOCI and earnings from derivative contracts that qualified as cash flow hedges was as follows:

(millions)		2018	2017	2016
Unrealized gain (loss) recognized into AOCI				
Foreign currency forward contracts	AOCI (equity)	\$144.4	\$(173.4)	\$7.0
Interest rate swap agreements	AOCI (equity)	-	-	(9.3)
	Total	144.4	(173.4)	(2.3)
Gain (loss) recognized in income				
Foreign currency forward contracts	Cost of sales	(7.7)	(13.7)	23.0
	SG&A	84.1	(157.2)	(0.1)
	Interest expense, net	37.4	24.5	5.8
	Subtotal	113.8	(146.4)	28.7
Interest rate swap agreements	Interest expense, net	(5.5)	(7.2)	(6.6)
	Total	\$108.3	\$(153.6)	\$22.1

Gains and losses recognized in income related to the ineffective portion of the Company's cash flow hedges were insignificant during 2018, 2017 and 2016.

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 rate to a floating 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 and \$250 million 3.69% debt expired in December 2017, January 2018 and November 2018, respectively, upon repayment of the underlying debt.

The interest rate swaps referenced above were designated as fair value hedges. The impact on earnings from derivative contracts that qualified as fair value hedges was as follows:

(millions)		2018	2017	2016
Gain (loss) on derivative recognized income				
Interest rate swap	Interest expense, net	\$4.0	\$(0.7)	\$(1.4)
Gain (loss) on hedged item recognized income				
Interest rate swap	Interest expense, net	\$(4.0)	\$0.7	\$1.4

Net Investment Hedges

The Company designates its outstanding \$1,290.4 million (€1,150 million as of year-end 2018) 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 third quarter of 2018 and the fourth quarter of 2017. 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)	2018	2017	2016
Revaluation gains (losses), net of tax	\$57.5	\$(109.7)	\$(2.5)

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.

The impact on earnings from derivative contracts that are not designated as hedging instruments was as follows:

(millions)		2018	2017	2016
Gain (loss) recognized in income				
Foreign currency forward contracts	SG&A	\$25.1	\$(38.2)	\$(6.0)
	Interest expense, net	5.3	(3.0)	(8.4)
	Total	\$30.4	\$(41.2)	\$(14.4)

The amounts recognized in SG&A above offset the earnings impact of the related foreign currency denominated assets and liabilities. The amounts recognized in interest expense above represent the component of the hedging gains (losses) attributable to the difference between the spot and forward rates of the hedges as a result of interest rate differentials.

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)	2018	2017	2016
Derivative and Hedging Instruments			
Unrealized gains (losses) on derivative & hedging instruments			
Amount recognized in AOCI	\$144.4	\$(173.4)	\$(2.3)
(Gains) losses reclassified from AOCI into income			
Cost of sales	7.7	13.7	(23.0)
SG&A	(84.1)	157.2	0.1
Interest (income) expense, net	(31.9)	(17.3)	0.8
	(108.3)	153.6	(22.1)
Other activity	-	0.2	(0.2)
Tax impact	(7.7)	1.7	7.1
Net of tax	\$28.4	\$(17.9)	\$(17.5)
Pension and Postretirement Benefits			
Amount recognized in AOCI			
Current period net actuarial income (loss) and prior service costs	\$(56.5)	\$(46.9)	\$(136.0)
Amount reclassified from AOCI into income			
Amortization of net actuarial loss and prior service costs and benefits	28.4	21.5	32.2
Pension and postretirement benefits changes	59.3	-	54.0
	31.2	(25.4)	(49.8)
Tax impact	(13.2)	16.2	9.3
Net of tax	\$18.0	\$(9.2)	\$(40.5)

10. SHAREHOLDERS' EQUITY

Authorized common stock, par value \$1.00 per share, was 800 million shares at December 31, 2018, 2017 and 2016. Treasury stock is stated at cost. Dividends declared per share of common stock were \$1.690 for 2018, \$1.520 for 2017 and \$1.420 for 2016.

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, 2018, 8,651,394 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 agreements 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 equity transactions.

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 2018, the Company reacquired 3,908,041 shares of its common stock, of which 3,706,716 related to share repurchases through open market or private purchases, and 201,325 related to shares withheld for taxes on exercise of stock options and the vesting of stock awards and units.

During 2017, the Company reacquired 4,707,629 shares of its common stock, of which 4,414,416 related to share repurchases through open market or private purchases, including the February 2017 ASR discussed above, and 293,213 related to shares withheld for taxes on exercise of stock options and the 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, 2018, 2017 and 2016 were 10,152,863, 11,685,090 and 13,649,667, 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 \$94 million (\$78 million net of tax benefit), \$90 million (\$62 million net of tax benefit) and \$86 million (\$59 million net of tax benefit) for 2018, 2017 and 2016, respectively. As of December 31, 2018, there was \$140 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 2.2 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:

	2018		2017		2016	
	Number of Options	Exercise Price (a)	Number of Options	Exercise Price (a)	Number of Options	Exercise Price (a)
Outstanding, beginning of year	11,380,013	\$ 95.76	11,910,501	\$ 84.22	12,378,372	\$ 74.23
Granted	1,202,314	158.23	1,491,893	136.87	1,679,941	117.60
Exercised	(1,942,192)	64.63	(1,951,920)	56.00	(2,061,553)	50.33
Canceled	(123,502)	127.02	(70,461)	116.44	(86,259)	111.08
Outstanding, end of year	10,516,633	\$ 108.28	11,380,013	\$ 95.76	11,910,501	\$ 84.22
Exercisable, end of year	7,993,297	\$ 97.13	8,371,809	\$ 84.40	8,720,943	\$ 72.35
Vested and expected to vest, end of year	10,365,162	\$ 107.77				

(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 2018, 2017 and 2016 was \$161 million, \$142 million and \$140 million, respectively.

The total aggregate intrinsic value of options outstanding as of December 31, 2018 was \$397 million, with a corresponding weighted-average remaining contractual life of 6.4 years. The total aggregate intrinsic value of options exercisable as of December 31, 2018 was \$391 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, 2018 was \$397 million, with a corresponding weighted-average remaining contractual life of 6.4 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:

	2018	2017	2016
Weighted-average grant-date fair value of options granted at market prices	\$ 37.34	\$ 30.34	\$ 25.59
Assumptions			
Risk-free rate of return	2.8 %	2.2 %	2.0 %
Expected life	6 years	6 years	6 years
Expected volatility	22.5 %	22.7 %	22.9 %
Expected dividend yield	1.2 %	1.2 %	1.3 %

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 84 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, 2015	1,444,189	\$ 95.59	273,235	\$ 102.49
Granted	371,859	112.29	88,437	109.27
Vested / Earned	(402,509)	68.64	(96,874)	94.06
Canceled	(26,852)	105.09	(10,411)	105.07
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

(a) Represents weighted average price per share.

12. INCOME TAXES

Income before income taxes consisted of:

(millions)	2018	2017	2016
United States	\$728.3	\$847.3	\$655.7
International	1,076.3	915.1	993.7
Total	\$1,804.6	\$1,762.4	\$1,649.4

The provision (benefit) for income taxes consisted of:

(millions)	2018	2017	2016
Federal and state	\$103.5	\$241.8	\$224.2
International	175.7	355.1	269.7
Total current	279.2	596.9	493.9
Federal and state	51.8	(331.4)	(49.6)
International	33.3	(21.7)	(41.4)
Total deferred	85.1	(353.1)	(91.0)
Provision for income taxes	\$364.3	\$243.8	\$402.9

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

December 31 (millions)	2018	2017
Deferred tax assets		
Other accrued liabilities	\$130.9	\$122.8
Loss carryforwards	217.2	67.3
Share-based compensation	60.5	58.9
Pension and other comprehensive income	145.8	195.2
Other, net	68.5	132.7
Valuation allowance	(184.4)	(21.3)
Total	438.5	555.6
Deferred tax liabilities		
Property, plant and equipment basis differences	(268.5)	(178.4)
Intangible assets	(783.3)	(844.0)
Other, net	(46.2)	(63.2)
Total	(1,098.0)	(1,085.6)
Net deferred tax liabilities balance	\$ (659.5)	\$ (530.0)

Deferred tax assets and liabilities are recorded based on the rates at which they are expected to reverse in the future. At December 31, 2018 and 2017, U.S. deferred tax assets and liabilities were recorded at the U.S. federal tax rate of 21%. In response to the enactment of the Tax Cuts and Jobs Act on December 22, 2017, which reduced the U.S. federal tax rate from 35% to 21%, the Company recorded a provisional income tax benefit of \$319.0 million as a result of recording U.S. deferred tax assets and liabilities at the enacted tax rate, which is a discrete tax item within income tax expense in 2017.

As of December 31, 2018, the Company has tax effected federal, state and international net operating loss carryforwards of \$0.2 million, \$21.7 million and \$195.3 million, respectively, which will be available to offset future taxable income. The state loss carryforwards expire from 2019 to 2039. For the international loss carryforwards, \$172.0 million expire from 2019 to 2039 and \$23.3 million have no expiration.

The Company has valuation allowances on certain deferred tax assets of \$184.4 million and \$21.3 million at December 31, 2018 and 2017, respectively. The increase in valuation allowance from year end 2017 to year end 2018 was driven by changes in entity structure as part of an internal entity reorganization, which created net operating losses which are not expected to be realized and therefore a valuation allowance was recorded. Current year losses and foreign currency translation also increased the valuation allowance.

In 2018, 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 which expire in January 2021. These incentives provide for a preferential 10% tax rate on certain headquarter income and a 0% tax rate on manufacturing profits generated at the Company's facility located on Jurong Island. In 2016 one of the Company's legal entities in China was entitled to the benefit of incentives provided by the Chinese government to technology companies in order to encourage development of the high-tech industry, including reduced tax rates and other measures. As a result, the Company was entitled to a preferential enterprise income tax rate of 15%. The Company did not recognize a benefit related to this China tax incentive in 2018 or 2017. The tax reduction as the result of the tax holidays for 2018 was \$25.6 million (\$0.09 per diluted share), 2017 was \$16.9 million (\$0.06 per diluted share) and 2016 was \$6.4 million (\$0.02 per diluted share).

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

	2018	2017	2016
Statutory U.S. rate	21.0 %	35.0 %	35.0 %
One-time transition tax	3.7	9.1	-
State income taxes, net of federal benefit	1.2	0.4	0.9
Foreign operations	(13.5)	(7.4)	(8.0)
Domestic manufacturing deduction	-	(2.2)	(2.0)
R&D credit	(1.0)	(1.0)	(1.1)
Change in valuation allowance	9.1	0.2	(0.7)
Audit settlements and refunds	(0.8)	(0.1)	(0.2)
Excess stock benefits	(1.6)	(2.3)	-
Change in federal tax rate (deferred taxes)	(0.6)	(18.2)	-
Prior year adjustments	2.5	-	-
Worthless stock deduction	-	-	0.4
Other, net	0.2	0.3	0.1
Effective income tax rate	20.2 %	13.8 %	24.4 %

Prior to enactment of the Tax Act, the Company did not recognize a deferred tax liability related to unremitted foreign earnings because it overcame the presumption of the repatriation of foreign earnings. 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. The one-time transition tax was based on certain foreign earnings and profits for which earnings had been previously indefinitely reinvested, as well as estimates of assets and liabilities at future dates. The transition tax was based in part on the amount of those earnings held in cash and other specified assets. No additional income taxes have been provided for any remaining undistributed foreign earnings not subject to the transition tax and any additional outside basis differences inherent in these entities as these amounts continue to be indefinitely reinvested in foreign operations. 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 2018, the Company recorded additional discrete expense of \$66.0 million, primarily due to the issuance of technical guidance, finalization of certain estimates as a result of filing the 2017 U.S. federal tax return and final balance sheet positions used in the calculation of the transition tax. As of December 31, 2018, we 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.

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 2014. The IRS has completed examinations of the Company's U.S. federal income tax returns (Ecolab and Nalco) through 2014, and the years 2015 and 2016 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 its 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/or 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 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.

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.

During 2016, the Company recognized net expense related to discrete tax items of \$3.9 million. The net expenses were driven primarily by recognizing adjustments from filing the Company's 2015 U.S. federal income tax return, partially offset by settlement of international tax matters and remeasurement of certain deferred tax assets and liabilities resulting from the application of updated tax rates in international jurisdictions. Net expense was also impacted by adjustments to deferred tax asset and liability positions and the release of reserves for uncertain tax positions due to the expiration of statute of limitations in non-U.S. jurisdictions.

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

(millions)	2018	2017	2016
Balance at beginning of year	\$61.5	\$75.9	\$74.6
Additions based on tax positions related to the current year	3.0	3.2	8.8
Additions for tax positions of prior years	2.0	-	2.1
Reductions for tax positions of prior years	(8.7)	(4.9)	(1.0)
Reductions for tax positions due to statute of limitations	(5.8)	(14.0)	(5.5)
Settlements	(0.8)	(10.8)	(2.0)
Assumed in connection with acquisitions	-	10.0	-
Foreign currency translation	(1.5)	2.1	(1.1)
Balance at end of year	\$49.7	\$61.5	\$75.9

The total amount of unrecognized tax benefits, if recognized would have affected the effective tax rate by \$36.4 million as of December 31, 2018, \$47.1 million as of December 31, 2017 and \$57.5 million as of December 31, 2016.

The Company recognizes interest and penalties related to unrecognized tax benefits in its provision for income taxes. During 2018, 2017 and 2016 the Company released \$1.2 million, \$0.9 million and \$2.9 million related to interest and penalties, respectively. The Company had \$8.1 million, \$9.3 million and \$10.2 million of accrued interest, including minor amounts for penalties, at December 31, 2018, 2017, and 2016, respectively.

13. RENTALS AND LEASES

The Company leases sales and administrative office facilities, distribution centers, research and manufacturing facilities, as well as vehicles and other equipment under operating leases. Total rental expense under the Company's operating leases was \$210 million in 2018, \$239 million in 2017 and \$221 million in 2016. 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 enters into operating leases for vehicles whose non-cancelable terms are one year or less in duration with reasonably assured month-to-month renewal options. These leases are included in the table above. These vehicle leases have residual value requirements that have historically been satisfied by the proceeds on the sale of the vehicles.

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 \$216 million in 2018, \$201 million in 2017 and \$189 million in 2016. The Company did not participate in any material customer sponsored research during 2018, 2017 or 2016.

15. COMMITMENTS AND CONTINGENCIES

The Company is subject to various claims and contingencies related to, among other things, workers' compensation, labor and employment, general liability (including product liability), automobile claims, health care claims, 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 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 deep water 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 Nalco Company, now an indirect subsidiary of Ecolab, to supply large quantities of COREXIT® 9500, a Nalco oil dispersant product listed on the U.S. EPA National Contingency Plan Product Schedule. Nalco Company 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, Nalco and its subsidiaries 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 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 Nalco Company, "to ensure decisions about ongoing dispersant use in the Gulf of Mexico are grounded in the best available science." Nalco Company 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, Nalco Company has been named in several lawsuits as described below.

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 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"). Nalco Company was 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 our 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 Nalco Company and others who responded to the Gulf Oil Spill (known as the "B3 Master Complaint"). On May 18, 2012, Nalco filed a motion for summary judgment against the claims in the "B3" Master Complaint, on the grounds that: (i) Plaintiffs' claims are preempted by the comprehensive oil spill response scheme set forth in the Clean Water Act and National Contingency Plan; and (ii) Nalco is entitled to derivative immunity from suit. On November 28, 2012, the Court granted Nalco's motion and dismissed with prejudice the claims in the "B3" Master Complaint asserted against Nalco. 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 Nalco Company and its related entities.

Nalco Company, 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 Nalco Company 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, Nalco Company filed counterclaims against the Cross Claimants. In its counterclaims, Nalco Company generally alleges that if it is found liable for damages resulting from the Deepwater Horizon explosion, oil spill and/or spill response, it is entitled to contribution or indemnity from the Cross Claimants.

In May 2016, Nalco was 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, Nalco was named in two additional complaints filed by individuals seeking, among other things, business and economic loss resulting from the Deepwater Horizon oil spill. The plaintiffs in these lawsuits generally sought awards of unspecified compensatory and punitive damages, and attorneys' fees and costs. These actions were consolidated in the MDL and the Company expects they will be dismissed pursuant to the Court's November 28, 2012 order granting Nalco's motion for summary judgment.

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 Nalco. 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 Nalco is now final and the deadline to appeal has passed. On October 23, 2018, a plaintiff filed a new "B3" complaint against Nalco 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 the MDL. There currently remain nine cases pending against Nalco, all of which are expected to ultimately be dismissed pursuant to the Court's November 28, 2012 order granting Nalco's motion for summary judgment.

The Company believes the claims asserted against Nalco Company are without merit and intends to defend these lawsuits vigorously. The Company also believes that it has rights to contribution and/or indemnification (including legal expenses) from third parties. However, the Company 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 \$119 million and \$124 million at December 31, 2018 and 2017, 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.

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	
	2018	2017	2018	2017	2018	2017
Accumulated Benefit Obligation, end of year	\$2,189.0	\$2,399.5	\$1,349.9	\$1,434.5	\$147.3	\$181.3
Projected Benefit Obligation						
Projected benefit obligation, beginning of year	\$2,485.1	\$2,267.9	\$1,537.9	\$1,335.6	\$181.3	\$173.5
Service cost	74.5	70.2	33.2	31.4	2.7	2.6
Interest	83.1	83.4	29.1	28.4	5.6	5.8
Participant contributions	-	-	3.5	3.5	3.5	8.3
Medicare subsidies received	-	-	-	-	-	0.5
Curtailments and settlements	-	0.1	(22.8)	(10.7)	-	-
Plan amendments	(40.4)	-	-	-	(13.7)	1.8
Actuarial (gain) loss	(181.3)	183.1	(42.7)	31.9	(18.4)	9.2
Assumed through acquisitions	-	-	11.4	24.1	-	-
Benefits paid	(180.0)	(119.6)	(38.7)	(35.8)	(13.7)	(20.4)
Foreign currency translation	-	-	(74.2)	129.5	-	-
Projected benefit obligation, end of year	\$2,241.0	\$2,485.1	\$1,436.7	\$1,537.9	\$147.3	\$181.3
Plan Assets						
Fair value of plan assets, beginning of year	\$2,226.4	\$1,950.1	\$981.1	\$821.9	\$7.6	\$9.6
Actual returns on plan assets	(70.7)	310.2	2.6	76.1	(0.2)	1.2
Company contributions	5.7	85.9	42.0	41.0	12.3	17.2
Participant contributions	-	-	3.5	3.5	-	-
Acquisitions	-	-	6.4	12.5	-	-
Settlements	-	(0.2)	(22.8)	(10.7)	-	-
Benefits paid	(180.0)	(119.6)	(38.7)	(35.8)	(13.7)	(20.4)
Foreign currency translation	-	-	(48.5)	72.6	-	-
Fair value of plan assets, end of year	\$1,981.4	\$2,226.4	\$925.6	\$981.1	\$6.0	\$7.6
Funded Status, end of year	\$(259.6)	\$(258.7)	\$(511.1)	\$(556.8)	\$(141.3)	\$(173.7)
Amounts recognized in Consolidated Balance Sheet:						
Other assets	\$-	\$-	\$39.0	\$41.7	\$-	\$-
Other current liabilities	(5.9)	(5.6)	(24.4)	(23.0)	(5.0)	(3.5)
Postretirement healthcare and pension benefits	(253.7)	(253.1)	(525.7)	(575.5)	(136.3)	(170.2)
Net liability	\$(259.6)	\$(258.7)	\$(511.1)	\$(556.8)	\$(141.3)	\$(173.7)
Amounts recognized in Accumulated Other Comprehensive Loss (Income):						
Unrecognized net actuarial loss (gain)	\$539.2	\$526.9	\$368.0	\$388.2	\$36.0	\$(20.1)
Unrecognized net prior service benefits	(52.3)	(18.7)	(6.0)	(7.0)	(34.4)	(40.4)
Tax expense (benefit)	(194.4)	(199.5)	(92.7)	(98.4)	27.6	25.2
Accumulated other comprehensive loss (income), net of tax	\$292.5	\$308.7	\$269.3	\$282.8	\$(42.8)	\$(35.3)
Change in Accumulated Other Comprehensive Loss (Income):						
Amortization of net actuarial (gain) loss	\$(38.9)	\$(28.7)	\$(16.5)	\$(18.5)	\$1.9	\$2.4
Amortization of prior service costs	6.8	6.8	0.9	0.7	19.7	16.7
Current period net actuarial loss (gain)	51.2	22.6	17.9	14.0	(17.8)	8.5
Current period prior service costs	-	-	-	-	5.2	1.8
Settlement	-	-	(2.3)	(0.9)	-	-
Tax expense (benefit)	5.1	(0.3)	5.7	(9.0)	2.4	(6.9)
Pension and Postretirement benefits changes	(40.4)	-	-	-	(18.9)	-
Foreign currency translation	-	-	(19.2)	35.6	-	-
Other comprehensive loss (income)	\$(16.2)	\$0.4	\$(13.5)	\$21.9	\$(7.5)	\$22.5

(a) Includes qualified and non-qualified plans

Estimated amounts in accumulated other comprehensive loss expected to be reclassified to net period cost during 2019 are as follows:

(millions)	U.S. Pension (a)	International Pension	U.S. Post- Retirement Health Care
Net actuarial loss (gain)	\$23.6	\$16.4	\$(4.0)
Net prior service costs (benefits)	(11.5)	(0.9)	(23.2)
Total	\$12.1	\$15.5	\$(27.2)

(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)	2018	2017
Aggregate projected benefit obligation	\$3,427.1	\$3,636.2
Accumulated benefit obligation	3,308.4	3,476.1
Fair value of plan assets	2,624.3	2,794.0

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		
	2018	2017	2016	2018	2017	2016	2018	2017	2016
Service cost	\$74.5	\$70.2	\$67.1	\$33.2	\$31.4	\$27.8	\$2.7	\$2.6	\$3.0
Interest cost on benefit obligation	83.1	83.4	81.5	29.1	28.4	31.9	5.6	5.8	7.4
Expected return on plan assets	(161.9)	(149.9)	(143.6)	(63.2)	(56.3)	(52.5)	(0.4)	(0.5)	(0.7)
Recognition of net actuarial (gain) loss	39.0	28.7	30.7	17.2	18.5	12.8	(1.9)	(2.4)	(1.6)
Amortization of prior service cost (benefit)	(6.8)	(6.8)	(6.9)	(0.9)	(0.7)	(0.8)	(19.7)	(16.7)	(4.3)
Settlements/Curtailments	-	0.3	0.5	2.3	0.9	1.8	-	-	-
Total expense (benefit)	\$27.9	\$25.9	\$29.3	\$17.7	\$22.2	\$21.0	\$(13.7)	\$(11.2)	\$3.8

(a) Includes qualified and non-qualified plans

Plan Assumptions

(percent)	U.S. Pension (a)			International Pension			U.S. Postretirement Health Care		
	2018	2017	2016	2018	2017	2016	2018	2017	2016
Weighted-average actuarial assumptions used to determine benefit obligations as of year end:									
Discount rate	4.34 %	3.70 %	4.27 %	2.49%	2.17 %	2.33 %	4.29 %	3.66 %	4.14 %
Projected salary increase	4.03	4.03	4.03	2.46	2.46	2.52			
Weighted-average actuarial assumptions used to determine net cost:									
Discount rate	3.70	4.27	4.51	2.29	2.32	2.68	3.66	4.14	4.38
Expected return on plan assets	7.75	7.75	7.75	6.67	6.67	6.71	7.75	7.75	7.75
Projected salary increase	4.03	4.03	4.32	2.67	2.83	2.75			

(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.

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, 2018, the annual rates of increase in the per capita cost of covered health care were assumed to be 8.25% for pre-65 costs and 11.50% 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).

During the third quarter of 2016, the Compensation Committee of the Company's Board of Directors approved moving the U.S. postretirement healthcare plans to a Retiree Exchange approach, rather than the Employee Group Waiver Plan plus Wrap program, for post-65 retiree medical coverage beginning in 2018, and the Company informed all eligible legacy Ecolab and legacy Nalco retirees of the change. As a result of the approval and communication to the beneficiaries, the Ecolab and Nalco plans were re-measured, resulting in a \$50 million reduction of postretirement benefit obligations, with a corresponding impact to AOCI of \$31 million, net of tax. The remeasurement was completed using discount rates of 3.29% and 3.60%, respectively. Additionally, at the time of this remeasurement, the Nalco U.S. postretirement health care plan was merged with the Ecolab U.S. postretirement health care plan. As a result of these actions, the Company's U.S. postretirement health care costs decreased by \$5 million in 2016.

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.

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, 2018			Fair Value as of December 31, 2017		
	Level 1	Level 2	Total	Level 1	Level 2	Total
Cash	\$7.1	\$-	\$7.1	\$8.0	\$-	\$8.0
Equity securities:						
Large cap equity	683.5	-	683.5	869.8	-	869.8
Small cap equity	168.6	-	168.6	198.4	-	198.4
International equity	285.0	-	285.0	340.2	-	340.2
Fixed income:						
Core fixed income	358.3	-	358.3	390.0	-	390.0
High-yield bonds	107.6	-	107.6	109.9	-	109.9
Emerging markets	39.4	-	39.4	42.9	-	42.9
Insurance company accounts	-	0.3	0.3	-	0.3	0.3
Total investments at fair value	1,649.5	0.3	1,649.8	1,959.2	0.3	1,959.5
Investments measured at NAV			337.6			274.5
Total	\$1,649.5	\$0.3	\$1,987.4	\$1,959.2	\$0.3	\$2,234.0

The Company had no level 3 assets as part of its U.S. plan assets as of December 31, 2018 or 2017.

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	
	2018	2017	2018	2017
December 31 (%)				
Cash	- %	- %	- %	- %
Equity securities:				
Large cap equity	34	34	34	39
Small cap equity	9	9	9	9
International equity	15	15	14	15
Fixed income:				
Core fixed income	18	18	19	18
High-yield bonds	5	5	5	5
Emerging markets	2	2	2	2
Other:				
Real estate	6	6	8	7
Private equity	8	8	7	5
Distressed debt	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, 2018			Fair Value as of December 31, 2017		
	Level 1	Level 2	Total	Level 1	Level 2	Total
Cash	\$7.1	\$-	\$7.1	\$8.7	\$-	\$8.7
Equity securities:						
International equity	-	412.1	412.1	-	442.2	442.2
Fixed income:						
Corporate bonds	7.9	162.1	170.0	8.2	173.0	181.2
Government bonds	12.3	169.2	181.5	12.4	177.6	190.0
Insurance company accounts	-	140.5	140.5	-	144.1	144.1
Total investments at fair value	27.3	883.9	911.2	29.3	936.9	966.2
Investments measured at NAV			14.4			14.9
Total	\$27.3	\$883.9	\$925.6	\$29.3	\$936.9	\$981.1

The Company had no level 3 assets as part of its international plan assets as of December 31, 2018 or 2017.

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	
	2018	2017
December 31 (%)		
Cash	1 %	1 %
Equity securities:		
International equity	45	45
Fixed income:		
Corporate bonds	18	19
Government bonds	20	19
Total fixed income	38	38
Other:		
Insurance contracts	15	15
Real estate	1	1
Total	100 %	100 %

Cash Flows

As of year-end 2018, 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
2019	\$ 203
2020	223
2021	234
2022	243
2023	238
2024 - 2028	1,233

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 2017, the Company made an \$80 million voluntary contribution to its non-contributory qualified U.S. pension plan and expects to make an \$120 million voluntary contribution in 2019. 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 \$48 million in 2019.

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 \$83 million, \$82 million and \$74 million in 2018, 2017 and 2016, respectively.

17. REVENUES

Revenue Recognition

Product and Sold Equipment

Product revenue is generated from cleaning, sanitizing, water and energy products provided to customers in the Global Industrial, Global Institutional and Global Energy segments. 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 include Pest Elimination and, prior to the Equipment Care disposal in 2017, kitchen equipment repair and maintenance. 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 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 840 Leases and recognized on a straight-line basis over the length of the lease contract.

Practical Expedients and Exemptions

The Company elected to apply the portfolio approach primarily within each operating segment by geographical region. 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. 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)	2018	2017	2016
Global Industrial			
Product and sold equipment	\$4,626.2	\$4,305.3	\$4,137.7
Service and lease equipment	660.3	612.7	557.5
Global Institutional			
Product and sold equipment	4,415.4	4,136.2	3,902.5
Service and lease equipment	683.1	640.0	580.4
Global Energy			
Product and sold equipment	3,004.4	2,837.5	2,703.2
Service and lease equipment	416.7	392.5	389.7
Other			
Product and sold equipment	82.6	152.8	160.7
Service and lease equipment	779.5	758.9	720.1
Total			
Total product and sold equipment	\$12,128.6	\$11,431.8	\$10,904.1
Total service and lease equipment	2,539.6	2,404.1	2,247.7

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

(millions)	Global Industrial			Global Institutional		
	2018	2017	2016	2018	2017	2016
United States	\$2,269.7	\$2,087.8	\$1,978.1	\$3,279.2	\$3,107.2	\$3,051.0
Europe	1,288.4	1,183.0	1,110.2	1,038.4	928.8	740.9
Asia Pacific	685.8	661.4	635.5	250.4	237.1	233.2
Latin America	474.3	448.0	411.6	165.6	163.6	151.6
Greater China	278.4	267.0	296.1	113.8	102.1	93.1
Canada	148.9	137.4	130.8	191.6	175.3	158.7
Middle East and Africa ("MEA")	141.0	133.4	132.9	59.5	62.1	54.4
Total	\$5,286.5	\$4,918.0	\$4,695.2	\$5,098.5	\$4,776.2	\$4,482.9

(millions)	Global Energy			Other		
	2018	2017	2016	2018	2017	2016
United States	\$1,630.1	\$1,481.1	\$1,373.9	\$569.2	\$648.2	\$631.8
Europe	398.4	404.4	389.3	133.1	119.5	116.6
Asia Pacific	262.7	253.1	257.1	40.2	33.6	33.1
Latin America	219.7	239.3	247.5	46.7	44.8	42.1
Greater China	76.5	70.5	71.6	50.5	45.0	39.0
Canada	335.6	322.3	278.9	11.5	9.4	8.4
MEA	498.1	459.3	474.6	10.9	11.2	9.8
Total	\$3,421.1	\$3,230.0	\$3,092.9	\$862.1	\$911.7	\$880.8

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 2018, 2017 and 2016.

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 2018	December 31 2017
Contract liability as of beginning of period	\$79.0	\$68.6
Revenue recognized in the period from: Amounts included in the contract liability at the beginning of the period	(79.0)	(68.6)
Increases due to billings excluding amounts recognized as revenue during the period	74.3	76.8
Business combination	1.5	2.2
Contract liability as of end of period	\$75.8	\$79.0

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.

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. Fixed currency rates are generally based on existing market rates at the time they are established. 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 2018. Fixed currency amounts during 2018 for Argentina operations are reflected at the Argentine Peso rate established by management at the beginning of the year.

Effective in the first quarter of 2018, the Company established the CTG operating segment. CTG was previously recorded in the Water operating segment which is aggregated into the Global Industrial reportable segment. Prior to the sale in November 2017, the Equipment Care operating segment was also included, which provided kitchen repair and maintenance. The Company also made insignificant changes to its reportable segments, including the movement of certain customers and cost allocations between reportable segments. These changes are presented in "Segment Change" column of the table on the following page.

The impact of the preceding changes on previously reported full year 2017 and 2016 reportable segment net sales and operating income is summarized as follows:

(millions)	December 31, 2017					
	2017 Reported Valued at 2017 Management Rates	Revenue Standard Adoption	Pension Standard Adoption	Segment Change	Fixed Currency Rate Change	2017 Revised Valued at 2018 Management Rates
Net Sales						
Global Industrial	\$4,878.5	\$(0.8)	\$-	\$(56.9)	\$286.0	\$5,106.8
Global Institutional	4,744.9	(1.4)	-	(23.7)	190.2	4,910.0
Global Energy	3,199.3	-	-	0.7	81.7	3,281.7
Other	823.5	-	-	79.9	28.1	931.5
Subtotal at fixed currency rates	13,646.2	(2.2)	-	-	586.0	14,230.0
Effect of foreign currency translation	192.1	(0.2)	-	-	(586.0)	(394.1)
Consolidated reported GAAP net sales	\$13,838.3	\$(2.4)	\$-	\$-	\$-	\$13,835.9
Operating Income						
Global Industrial	\$722.0	\$(0.8)	\$(12.8)	\$2.6	\$47.5	\$758.5
Global Institutional	985.7	(1.4)	(13.1)	(14.9)	23.5	979.8
Global Energy	338.5	-	(16.7)	(0.7)	15.0	336.1
Other	149.3	-	(24.5)	13.0	4.7	142.5
Corporate	(208.6)	-	-	-	(5.3)	(213.9)
Subtotal at fixed currency rates	1,986.9	(2.2)	(67.1)	-	85.4	2,003.0
Effect of foreign currency translation	32.9	(0.2)	(0.2)	-	(85.4)	(52.9)
Consolidated reported GAAP operating income	\$2,019.8	\$(2.4)	\$(67.3)	\$-	\$-	\$1,950.1

(millions)	December 31, 2016					
	2016 Reported Valued at 2017 Management Rates	Revenue Standard Adoption	Pension Standard Adoption	Segment Change	Fixed Currency Rate Change	2016 Revised Valued at 2018 Management Rates
Net Sales						
Global Industrial	\$4,687.2	\$(0.4)	\$-	\$(70.3)	\$274.6	\$4,891.1
Global Institutional	4,440.1	(0.5)	-	-	158.6	4,598.2
Global Energy	3,075.8	-	-	-	80.0	3,155.8
Other	801.7	-	-	70.3	26.4	898.4
Subtotal at fixed currency rates	13,004.8	(0.9)	-	-	539.6	13,543.5
Effect of foreign currency translation	148.0	(0.1)	-	-	(539.6)	(391.7)
Consolidated reported GAAP net sales	\$13,152.8	\$(1.0)	\$-	\$-	\$-	\$13,151.8
Operating Income						
Global Industrial	\$720.0	\$(0.4)	\$(4.2)	\$(0.8)	\$43.7	\$758.3
Global Institutional	950.5	(0.5)	(10.2)	(9.8)	19.5	949.5
Global Energy	346.7	-	(8.0)	(1.5)	12.7	349.9
Other	145.2	-	(20.4)	12.1	4.7	141.6
Corporate	(272.6)	-	-	-	(5.2)	(277.8)
Subtotal at fixed currency rates	1,889.8	(0.9)	(42.8)	-	75.4	1,921.5
Effect of foreign currency translation	25.2	(0.1)	(1.0)	-	(75.4)	(51.3)
Consolidated reported GAAP operating income	\$1,915.0	\$(1.0)	\$(43.8)	\$-	\$-	\$1,870.2

Reportable Segment Information

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

(millions)	Net Sales			Operating Income (Loss)		
	2018	2017	2016	2018	2017	2016
Global Industrial	\$5,462.4	\$5,106.8	\$4,891.1	\$768.1	\$758.5	\$758.3
Global Institutional	5,204.5	4,910.0	4,598.2	1,026.9	979.8	949.5
Global Energy	3,501.8	3,281.7	3,155.8	358.5	336.1	349.9
Other	877.6	931.5	898.4	161.3	142.5	141.6
Corporate	-	-	-	(307.1)	(213.9)	(277.8)
Subtotal at fixed currency	15,046.3	14,230.0	13,543.5	2,007.7	2,003.0	1,921.5
Effect of foreign currency translation	(378.1)	(394.1)	(391.7)	(60.7)	(52.9)	(51.3)
Consolidated	\$14,668.2	\$13,835.9	\$13,151.8	\$1,947.0	\$1,950.1	\$1,870.2

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

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.

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	
	2018	2017
United States	\$9,175.4	\$8,853.7
Europe	2,538.7	2,623.8
Asia Pacific, excluding Greater China	1,003.4	1,022.5
Latin America	565.8	605.8
MEA	302.1	310.1
Canada	616.8	649.1
Greater China	1,194.6	1,301.0
Total	\$15,396.8	\$15,366.0

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
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
2017					
Net sales	\$3,162.4	\$3,460.0	\$3,564.5	\$3,649.0	\$13,835.9
Operating expenses					
Cost of sales (a)	1,842.9	2,036.6	2,055.7	2,129.0	8,064.2
Selling, general and administrative expenses	956.1	967.0	939.8	962.4	3,825.3
Special (gains) and charges	6.2	36.8	4.9	(51.6)	(3.7)
Operating income	357.2	419.6	564.1	609.2	1,950.1
Other (income) expense	(16.8)	(16.8)	(16.9)	(16.8)	(67.3)
Interest expense, net (a)	62.5	59.6	55.1	77.8	255.0
Income before income taxes	311.5	376.8	525.9	548.2	1,762.4
Provision for income taxes	54.2	80.5	129.3	(20.2)	243.8
Net income including noncontrolling interest	257.3	296.3	396.6	568.4	1,518.6
Net income attributable to noncontrolling interest	3.3	1.5	3.4	5.8	14.0
Net income attributable to Ecolab	\$254.0	\$294.8	\$393.2	\$562.6	\$1,504.6
Earnings attributable to Ecolab per common share					
Basic	\$ 0.87	\$ 1.02	\$ 1.36	\$ 1.95	\$ 5.20
Diluted	\$ 0.86	\$ 1.00	\$ 1.34	\$ 1.92	\$ 5.12
Weighted-average common shares outstanding					
Basic	290.6	289.8	289.0	289.1	289.6
Diluted	295.0	294.1	293.4	293.6	294.0

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 prior quarters with current accounting policies. There was no impact to net sales or operating income.

- (a) Cost of sales includes special charges of \$(0.1), \$3.6 and \$5.8 million in Q2, Q3 and Q4 of 2018, respectively and \$1.5, \$24.4, \$0.3, and \$17.8 million in Q1, Q2, Q3 and Q4 of 2017, respectively. Net interest expense includes special charges of \$0.3 million in Q4 of 2018 and \$21.9 million in Q4 of 2017.

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, 2018, 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, 2018.

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, 2018. 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, 2018 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 an enterprise resource planning ("ERP") system upgrade we began in 2018, which is expected to occur in phases over the next several years. This upgrade, which includes supply chain and certain finance functions, is expected to improve the efficiency of certain financial and related transactional processes. The upgrade of the ERP system 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 "Section 16(a) Beneficial Ownership Reporting Compliance" 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 "Executive Officers of the Registrant" 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 2018
- Compensation Risk Analysis
- Compensation Committee Interlocks and Insider Participation
- Compensation Committee Report
- Compensation Discussion and Analysis
- Summary Compensation Table for 2018
- Grants of Plan-Based Awards for 2018
- Outstanding Equity Awards at Fiscal Year-End for 2018
- Option Exercises and Stock Vested for 2018
- Pension Benefits for 2018
- Non-Qualified Deferred Compensation for 2018
- Potential Payments Upon Termination or Change in Control
- Pay Ratio Disclosure

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 1,336,346 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, 2018 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	12,158,096 (1)	\$ 108.87 (1)	10,152,863
Equity compensation plans not approved by security holders	116,250 (2)	55.60 (2)	-
Total	12,274,346	\$ 108.28	10,152,863

- (1) Includes 243,891 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, 1,267,353 Common Stock equivalents under our 2010 Stock Incentive Plan representing performance-based restricted stock units payable to employees, and 246,469 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 27,979 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 \$36.36, 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, 2018, 2017 and 2016.	51
(iii) Consolidated Statements of Comprehensive Income for the years ended December 31, 2018, 2017 and 2016.	52
(iv) Consolidated Balance Sheets at December 31, 2018 and 2017.	53
(v) Consolidated Statements of Cash Flows for the years ended December 31, 2018, 2017 and 2016.	54
(vi) Consolidated Statements of Equity for the years ended December 31, 2018, 2017 and 2016.	55
(vii) Notes to Consolidated Financial Statements.	56

Exhibit No.:	Document:	Method of Filing:
(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.	
(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)
(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)

Exhibit No.:	Document:	Method of Filing:
(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)	First Supplemental Indenture, dated January 15, 2015, 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 15, 2015. (File No. 001-9328)
(4.8)	Form of 2.250% Notes due 2020.	Included in Exhibit (4.7) above.
(4.9)	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)
(4.10)	Form of 2.625% Euro Notes due 2025.	Included in Exhibit (4.9) above.
(4.11)	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)
(4.12)	Forms of 2.000% Notes due 2019 and 3.250% Notes due 2023.	Included in Exhibit (4.11) above.
(4.13)	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)
(4.14)	Forms of 2.700% Notes due 2026 and 3.700% Notes due 2046.	Included in Exhibit (4.13) above.
(4.15)	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)
(4.16)	Form of 1.000% Euro Notes due 2024.	Included in Exhibit (4.15) above.
(4.17)	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)
(4.18)	Form of 2.375% Notes due 2022.	Included in Exhibit (4.17) above.
(4.19)	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)
(4.20)	Form of 3.250% Notes due 2027.	Included in Exhibit (4.19) above.
(4.21)	Form of 3.950% Notes due 2047.	Included in Exhibit (4.19) above.

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.À R.L., Ecolab Lux 2 S.À 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.À R.L., Ecolab Lux 2 S.À R.L. and 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.À R.L., Ecolab Lux 2 S.À 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.À R.L., Ecolab Lux 2 S.À 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.À R.L., Ecolab Lux 2 S.À 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.À R.L., Ecolab Lux 2 S.À 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, BofAML Securities, Inc., Mizuho Securities USA Inc., 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)

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)

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) 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)
	† (iii) 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)

Exhibit No.:	Document:	Method of Filing:
	† (iv) 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)
	† (v) Sample form of Performance-Based Restricted Stock Unit Award Agreement under the Ecolab Inc. 2010 Stock Incentive Plan, adopted December 2, 2015.	Incorporated by reference to Exhibit (10.17)(vi) of our Form 10-K Annual Report for the year ended December 31, 2015. (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.	Filed herewith electronically.
(10.16)	† Policy on Reimbursement of Incentive Payments, as amended February 22, 2019.	Filed herewith electronically.
(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)
(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.
(101.1)	Interactive Data File.	Filed herewith electronically.

† 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 1st day of March, 2019.

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 1st day of March, 2019.

/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 and Treasurer
Daniel J. Schmechel (Principal Financial Officer)

/s/ Bruno Lavandier Senior Vice President and Corporate Controller
Bruno Lavandier (Principal Accounting Officer)

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

as attorney-in-fact for:

Shari L. Ballard, Barbara J. Beck, Les S. Biller, Stephen I. Chazen,
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

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investor information

ANNUAL MEETING

Ecolab's annual meeting of stockholders will be held on Thursday, May 2, 2019, at 9:30 a.m. at the Ecolab Global Headquarters, 1 Ecolab Place, St. Paul, MN 55102.

COMMON STOCK

Our stock trading symbol is ECL. Ecolab common stock is listed and traded on the New York Stock Exchange (NYSE). Ecolab stock also is traded on an unlisted basis on certain other exchanges. Options are traded on the NYSE.

Ecolab common stock is included in the S&P 500 Materials sector of the Global Industry Classification Standard.

As of January 31, 2019, Ecolab had 5,962 shareholders of record. The closing stock price on the NYSE on January 31, 2019, was \$158.17 per share.

DIVIDEND POLICY

Ecolab has paid common stock dividends for 82 consecutive years. Quarterly cash dividends are typically paid on the 15th of January, April, July and October, or the ensuing business day.

DIVIDEND REINVESTMENT PLAN

Stockholders of record may elect to reinvest their dividends. Plan participants also may elect to purchase Ecolab common stock through this service.

To enroll in the plan, stockholders may contact the plan sponsor, Computershare, for a brochure and enrollment form.

GOVERNANCE

Disclosures concerning our board of directors' policies, governance principles and corporate ethics practices, including our Code of Conduct, are available online at www.investor.ecolab.com/corporate-governance.

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

PricewaterhouseCoopers LLP
45 South Seventh Street, Suite 3400
Minneapolis, MN 55402

INVESTOR INQUIRIES

Securities analysts, portfolio managers and representatives of financial institutions should contact:

Ecolab Investor Relations
1 Ecolab Place
St. Paul, MN 55102
Phone: 651.250.2500

INVESTOR RESOURCES

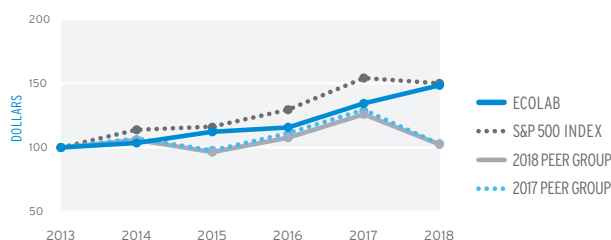
SEC FILINGS: Copies of Ecolab's Form 10-K, 10-Q and 8-K reports as filed with the Securities and Exchange Commission (SEC) are available free of charge. These documents may be obtained on our website at www.investor.ecolab.com/sec-filings promptly after such reports are filed with, or furnished to, the SEC, or by contacting:

Ecolab Inc.
Attn: Corporate Secretary
1 Ecolab Place
St. Paul, MN 55102
Email: investor.info@ecolab.com

INVESTMENT PERFORMANCE

The following stock performance graph assumes investment of \$100 in Ecolab Common Stock, the Standard & Poor's 500 Index and the company's self-selected composite peer group indices for 2017* and 2018* on December 31, 2013, and daily reinvestment of all dividends.

In 2017, Ecolab utilized competitive data from its self-selected peer group of 19 companies (the "2017 Peer Group") for purposes of benchmarking compensation for certain executives. In 2018, Ecolab revised its comparison group to reflect the merger or acquisition of several of its selected peers with other companies and the addition of several new companies to bring the new total to 20 companies (the "2018 Peer Group"). Therefore, in the performance graph below, Ecolab presents the total return performance for both 2017 Peer Group and 2018 Peer Group indices. Further information regarding the peer group can be found in Ecolab's proxy statement for the annual meeting to be held on May 2, 2019.



*COMMON 2017 AND 2018 PEERS:

3M Co.
Air Products and Chemicals Inc.
Ashland Global Holdings Inc.
Celanese Corp.
Danaher Corp.
Eastman Chemical Co.
Halliburton Co.
LyondellBasell Industries NV
Monsanto Co.
National Oilwell Varco Inc.
PPG Industries Inc.
Praxair Inc.
Schlumberger Ltd.
Sherwin-Williams Co.
Weatherford International plc

*PEERS DELETED IN 2018:

Baker Hughes Inc.
Dow Chemical Company
E.I. du Pont de Nemours and Co.
Sealed Air Corp.

*PEERS ADDED IN 2018:

Baker Hughes, a GE Co.
Emerson Electric Co.
General Mills Inc.
Illinois Tool Works Inc.
Roper Technologies Inc.

transfer agent, registrar and dividend paying agent

Stockholders of record may contact the transfer agent, Computershare Trust Company, N.A., to request assistance with a change of address, transfer of share ownership, replacement of lost stock certificates, dividend payment or tax reporting issues. If your Ecolab stock is held in a bank or brokerage account, please contact your bank or broker for assistance.

COURIER ADDRESS:

Computershare Trust
Company, N.A.
211 Quality Circle, Suite 210
College Station, TX 77845

TELEPHONE:

1.312.360.5203 or
1.800.322.8325

HEARING IMPAIRED:

1.312.588.4110 or
1.800.822.2794

GENERAL CORRESPONDENCE AND DIVIDEND REINVESTMENT PLAN CORRESPONDENCE:

Computershare Trust
Company, N.A.
P.O. Box 30170
College Station, TX 77842-3170

Computershare provides telephone assistance to stockholders Monday through Friday from 8:30 a.m. to 6 p.m. (Eastern Time). Around-the-clock service also is available online and via the telephone Interactive Voice Response system.

WEBSITE:

www.computershare.com/ecolab

board of directors

DOUGLAS M. BAKER, JR.

Chairman of the Board and Chief Executive Officer of Ecolab Inc., Director since 2004, Safety, Health and Environment Committee

SHARI L. BALLARD

Advisor to Best Buy Co., Inc. (consumer electronics products and services retailer), Director since 2018, Audit and Safety, Health and Environment Committees

BARBARA J. BECK

Chief Executive Officer of Learning Care Group Inc. (early education/child care provider), Director since 2008, Safety, Health and Environment* and Governance Committees

LESLIE S. BILLER

Chief Executive Officer of Harborview Capital (private investment and consultative company), Director since 1997, Finance* and Compensation Committees

STEPHEN I. CHAZEN

Chairman, President and Executive Officer of Magnolia Oil and Gas Corporation (oil and gas exploration and production company), Director since 2013, Audit and Finance Committees

JEFFREY M. ETTINGER

Retired Chairman of the Board of Hormel Foods Corporation (food products company), Director since 2015, Governance* and Compensation Committees and Lead Director

ARTHUR J. HIGGINS

President and Chief Executive Officer of Assertio Therapeutics, Inc. (specialty pharmaceutical company), Director since 2010, Compensation and Safety, Health and Environment Committees

MICHAEL LARSON

Chief investment officer to William H. Gates, III and Business Manager of Cascade Investment, L.L.C., Director since 2012, Finance and Safety, Health and Environment Committees

DAVID W. MACLENNAN

Chairman and Chief Executive Officer of Cargill, Incorporated (food, agricultural, financial, and industrial products and services company), Director since 2015, Audit and Governance Committees

TRACY B. MCKIBBEN

Founder and Chief Executive Officer of MAC Energy Advisors LLC (consulting company for alternative energy and clean technology investments), Director since 2015, Audit and Finance Committees

LIONEL L. NOWELL, III

Former Senior Vice President and Treasurer of PepsiCo, Inc. (food and beverage company), Director since 2018, Audit and Finance Committees

VICTORIA J. REICH

Former Senior Vice President and Chief Financial Officer of Essendant Inc. (wholesale distributor of business products), Director since 2009, Audit* and Governance Committees

SUZANNE M. VAUTRINOT

President of Kilovolt Consulting Inc. (consulting company for cyber security strategy and technology) and a retired Major General of the United States Air Force, Director since February 2014, Compensation and Finance Committees

JOHN J. ZILLMER

Retired President and Chief Executive Officer of Univar Inc. (industrial chemicals and related specialty services company), Director since 2006, Compensation* and Governance Committees

*Denotes committee chair

communication with directors

Stakeholders and other interested parties, including our investors and associates, with substantive matters requiring the attention of our board (e.g., governance issues or potential accounting, control or auditing irregularities) may use the contact information for our board located on our website at www.investor.ecolab.com/corporate-governance.

Matters not requiring the direct attention of our board – such as employment inquiries, sales solicitations, questions about our products and other such matters – should be submitted to the company's management at our Global Headquarters in St. Paul, Minn.

In addition to online communication, interested parties may direct correspondence to our board at:

Ecolab Inc.
Attn: Corporate Secretary
1 Ecolab Place
St. Paul, MN 55102

corporate officers

ANIL ARCAGUD

Executive Vice President and Chief Information Officer

DOUGLAS M. BAKER, JR.

Chairman of the Board and Chief Executive Officer

CHRISTOPHE BECK

Executive Vice President and President – Global Industrial

LARRY L. BERGER

Executive Vice President and Chief Technical Officer

ALEX N. BLANCO

Executive Vice President and Chief Supply Chain Officer

DARRELL R. BROWN

Executive Vice President and President – Energy Services

ANGELA M. BUSCH

Executive Vice President – Corporate & Business Development

THOMAS W. HANDLEY

President and Chief Operating Officer

MICHAEL A. HICKEY

Executive Vice President – Special Initiatives

ROBERTO D. INCHAUSTEGUI

Executive Vice President and President – Global Services and Specialty

BRUNO LAVANDIER

Senior Vice President and Corporate Controller

LAURIE M. MARSH

Executive Vice President – Human Resources

MICHAEL C. MCCORMICK

Executive Vice President, General Counsel and Secretary

JUDY M. MCNAMARA

Senior Vice President – Tax

TIMOTHY P. MULHERE

Executive Vice President and President – Global Institutional

JOANNE JIRIK MULLEN

Chief Compliance Officer and Associate General Counsel – Employment and Compliance

DANIEL J. SCHMECHEL

Chief Financial Officer and Treasurer

ELIZABETH A. SIMERMAYER

Executive Vice President – Global Marketing & Communications and Life Sciences

JILL S. WYANT

Executive Vice President and President – Global Regions and Global Healthcare

 **REDUCE, RE-USE, RECYCLE**

If you received multiple copies of this report, you may have duplicate investment accounts. Help save resources. Please contact your broker or the transfer agent to request assistance with consolidating any duplicate accounts.

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Global Headquarters
1 Ecolab Place, St. Paul, MN 55102
www.ecolab.com 1 800 2 ECOLAB

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ECOLAB[®]
Everywhere It Matters.™