CORNING INC /NY
Form 10-K
February 12, 2019
Index

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 number: 1-3247

CORNING INCORPORATED

(Exact name of registrant as specified in its charter)

NEW YORK	16-0393470
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

ONE RIVERFRONT PLAZA, CORNING, NY	14831
(Address of principal executive offices)	(Zip Code)

607-974-9000

(Registrant's telephone number, including area code)

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

Title of each class	Name of each exchange on which registered
Common Stock, $0.50 par value per share	New York Stock Exchange

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange 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 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 of this Form 10 K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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	Accelerated filer
Non-accelerated filer	Emerging growth company
Smaller reporting 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

As of June 30, 2018, the aggregate market value of the registrant’s common stock held by non-affiliates of the registrant was $22 billion based on the $27.51 price as reported on the New York Stock Exchange.

There were 786,761,073 shares of Corning’s common stock issued and outstanding as of January 31, 2019.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant’s Definitive Proxy Statement dated March 22, 2019, and filed for the Registrant’s 2019 Annual Meeting of Shareholders are incorporated into Part III of this Annual Report on Form 10-K, as specifically set forth in Part III.

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PART I

Corning Incorporated and its consolidated subsidiaries are hereinafter sometimes referred to as the “Company,” the “Registrant,” “Corning,” or “we.”

This report contains forward-looking statements that involve a number of risks and uncertainties. These statements relate to our future plans, objectives, expectations and estimates and may contain words such as “believes,” “expects,” “anticipates,” “estimates,” “forecasts,” or similar expressions. Our actual results could differ materially from what is expressed or forecasted in our forward-looking statements. Some of the factors that could contribute to these differences include those discussed under “Forward-Looking Statements,” “Risk Factors,” “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and elsewhere in this report.

Item 1. Business

General

Corning traces its origins to a glass business established in 1851. The present corporation was incorporated in the State of New York in December 1936. The Company’s name was changed from Corning Glass Works to Corning Incorporated on April 28, 1989.

Corning Incorporated is a leading innovator in materials science. For more than 165 years, Corning has combined its unparalleled expertise in glass science, ceramic science, and optical physics with deep manufacturing and engineering capabilities to develop category-defining products that transform industries and enhance people's lives. We succeed through sustained investment in research and development, a unique combination of material and process innovation, and deep, trust-based relationships with customers who are global leaders in their industries.

Corning’s capabilities are versatile and synergistic, which allows the company to evolve to meet changing market needs, while also helping our customers capture new opportunities in dynamic industries. Today, Corning’s markets include optical communications, mobile consumer electronics, display technology, automotive emissions control products, and life sciences vessels. Corning's industry-leading products include damage-resistant cover glass for mobile devices; precision glass for advanced displays; optical fiber, wireless technologies, and connectivity solutions for state-of-the-art communications networks; trusted products to accelerate drug discovery and delivery; and clean-air technologies for cars and trucks.

Corning operates in five reportable segments: Display Technologies, Optical Communications, Environmental Technologies, Specialty Materials and Life Sciences, and manufactures products at 108 plants in 15 countries.

Display Technologies Segment

Corning's Display Technologies segment manufactures glass substrates for high performance displays, including organic light-emitting diode ("OLEDs") and liquid crystal displays ("LCDs") that are used primarily in televisions, notebook computers and flat panel desktop monitors. This segment develops, manufactures and supplies high quality glass substrates using technology expertise and a proprietary fusion manufacturing process, which Corning invented and is the cornerstone of the Company's technology leadership in the display glass industry. Our highly automated process yields glass substrates with a pristine surface and excellent thermal dimensional stability and uniformity – essential attributes in the production of large, high performance display panels. Corning's fusion process is scalable and we believe it is the most cost-effective process in producing large size substrates.

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We are recognized for providing product innovations that enable our customers to produce larger, lighter, thinner and higher-resolution displays. Some of the product innovations that we have launched over the past ten years utilizing our world-class processes and capabilities include the following:

- Corning® EAGLE XG® Glass, the industry's first LCD glass substrate that is free of heavy metals;
- Corning® EAGLE XG® Slim Glass, a line of thin glass substrates which enables lighter-weight portable devices and thinner televisions and monitors;
- Corning IRIS™ Glass, a light-guide plate solution which enables televisions and monitors to be less the 5-mm thick;
- The family of Corning LOTUS™ Glass, high-performance display glass developed to enable cutting-edge technologies, OLEDs and next generation LCDs. These substrate glasses provide industry-leading levels of low total pitch variation, resulting in brighter, more energy-efficient displays with higher resolutions for consumers and better yields for panel makers; and
- The world's first Gen 10 and Gen 10.5 glass substrates in support of improved efficiency in manufacturing large-sized televisions.

Corning has display glass manufacturing operations in South Korea, Japan, Taiwan and China, and services all its glass customers in all regions directly, utilizing its manufacturing facilities throughout Asia.

Patent protection and proprietary trade secrets are important to the Display Technologies segment's operations. Refer to the material under the heading "Patents and Trademarks" for information relating to patents and trademarks.

The Display Technologies segment represented 29% of Corning's segment net sales in 2018.

Optical Communications Segment

Corning invented the world's first low-loss optical fiber in 1970. Since that milestone, we have continued to pioneer optical fiber, cable and connectivity solutions. As global bandwidth demand driven by video usage grows exponentially, telecommunications networks continue to migrate from copper to optical-based systems that can deliver the required cost-effective bandwidth-carrying capacity. Our experience puts us in a unique position to design and deliver optical solutions that reach every edge of the communications network.

This segment is classified into two main product groupings – carrier network and enterprise network. The carrier network group consists primarily of products and solutions for optical-based communications infrastructure for services such as video, data and voice communications. The enterprise network group consists primarily of optical-based communication networks sold to businesses, governments and individuals for their own use.

Our carrier network product portfolio encompasses an array of optical fiber products, including Vascade submarine optical fibers for use in submarine networks; LEAF optical fiber for long-haul, regional and metropolitan networks; SMF-28 ULL fiber for more scalable long-haul and regional networks; SMF-28e+ single-mode optical fiber that provides additional transmission wavelengths in metropolitan and access networks; ClearCurve ultra-bendable single-mode fiber for use in multiple-dwelling units and fiber-to-the-home applications; and Corning® SMF-28® Ultra Fiber, designed for high performance across the range of long-haul, metro, access, and fiber-to-the-home network applications, combining the benefits of industry-leading attenuation and improved macrobend performance in one fiber. A portion of our optical fiber is sold directly to end users and third-party cablers globally. Corning’s remaining fiber production is cabled internally and sold to end users as either bulk cable or as part of an integrated optical solution. Corning’s cable products support various outdoor, indoor/outdoor and indoor applications and include a broad range of loose tube, ribbon and drop cable designs with flame-retardant versions available for indoor and indoor/outdoor use.

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In addition to optical fiber and cable, our carrier network product portfolio also includes hardware and equipment products, including cable assemblies, fiber optic hardware, fiber optic connectors, optical components and couplers, closures, network interface devices, and other accessories. These products may be sold as individual components or as part of integrated optical connectivity solutions designed for various carrier network applications. Examples of these solutions include our FlexNAPTM terminal distribution system, which provides pre-connectorized distribution and drop cable assemblies for cost-effectively deploying fiber-to-the-home ("FTTH") networks; and the CentrixTM platform, which provides a high-density fiber management system with industry-leading density and innovative jumper routing that can be deployed in a wide variety of carrier switching centers.

To keep pace with surging demand for mobile bandwidth, Corning has a full complement of operator-grade distributed antenna systems ("DAS"), including the recently developed Optical Network Evolution wireless platform. The ONE™ Wireless Platform ("ONE") is the first all-optical converged cellular and Wi-Fi® solution built on an all-optical backbone with modular service support. It provides virtually unlimited bandwidth, and meets all wireless service needs of large-scale enterprises at a lower cost than the typical DAS solution.

In addition to our optical-based portfolio, Corning's carrier network portfolio also contains select copper-based products including subscriber demarcation, connection and protection devices, xDSL (different variations of digital subscriber lines) passive solutions and outside plant enclosures. In addition, Corning offers coaxial RF interconnects for the cable television industry as well as for microwave applications for GPS, radars, satellites, manned and unmanned military vehicles, and wireless and telecommunications systems.

Our enterprise network portfolio also includes optical fiber products, including ClearCurve ultra-bendable multimode fiber for data centers and other enterprise network applications; InfiniCor fibers for local area networks; and more recently ClearCurve VSDN ultra-bendable optical fiber designed to support emerging high-speed interconnects between computers and other consumer electronics devices. The remainder of Corning's fiber production is cabled internally and sold to end users as either bulk cable or as part of an integrated optical solution. Corning's cable products include a broad range of tight-buffered, loose tube and ribbon cable designs with flame-retardant versions available for indoor and indoor/outdoor applications that meet local building code requirements.

Corning's hardware and equipment for enterprise network applications include cable assemblies, fiber optic hardware, fiber optic connectors, optical components and couplers, closures and other accessories. These products may be sold as individual components or as part of integrated optical connectivity solutions designed for various network applications. Examples of enterprise network solutions include the Pretium EDGE platform, which provides high-density pre-connectorized solutions for data center applications, and continues to evolve with recent updates for upgrading to 40/100G applications and port tap modules for network monitoring; the previously mentioned ONE Wireless platform, which spans both carrier and enterprise network applications; and our recently introduced optical connectivity solutions to support customer initiatives.

In December 2017, Corning announced that it had entered into agreements with the 3M Company (3M) to purchase substantially all its Communication Markets Division ("CMD") in a cash transaction. During 2018, Corning acquired substantially all of CMD for $841 million.

Corning believes that this transaction will augment its Optical Communications segment's global market access and expand its broad portfolio of high-bandwidth optical connectors, assemblies, hardware, and accessories for carrier networks, enterprise LAN, and data center solutions.

Our optical fiber manufacturing facilities are in North Carolina, China and India. Cabling operations are in North Carolina, Germany, Poland, China and smaller regional locations. Our manufacturing operations for hardware and equipment products are in Texas, Arizona, Mexico, Brazil, Denmark, Germany, Poland, Israel, Australia and China.

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Patent protection is important to the segment's operations. The segment has an extensive portfolio of patents relating to its products, technologies and manufacturing processes. The segment licenses certain of its patents to third parties and generates revenue from these licenses, although the royalty income is not currently material to this segment's operating results. Corning is licensed to use certain patents owned by others, which are considered important to the segment's operations. Refer to the material under the heading "Patents and Trademarks" for information relating to the Company's patents and trademarks.

The Optical Communications segment represented 37% of Corning's segment net sales in 2018.

Specialty Materials Segment

The Specialty Materials segment manufactures products that provide more than 150 material formulations for glass, glass ceramics and fluoride crystals to meet demand for unique customer needs. Consequently, this segment operates in a wide variety of commercial and industrial markets that include display optics and components, semiconductor optics components, aerospace and defense, astronomy, ophthalmic products, telecommunications components and cover glass that is optimized for display devices.

Our cover glass, known as Corning® Gorilla® Glass, is a thin sheet glass designed specifically to function as a cover glass for display devices such as mobile phones, tablets and notebook PCs. Elegant and lightweight, Corning Gorilla Glass is durable enough to resist many real-world events that commonly cause glass failure, while maintaining optical clarity, touch sensitivity, and damage resistance, enabling exciting new applications in technology and design. In 2018, Corning unveiled its latest Corning Gorilla Glass innovation, Corning® Gorilla® Glass 6, which is designed to be stronger than previous formulas and provide further protection against breakage. Gorilla Glass 6 survives higher drop heights than Gorilla Glass 5, and survives repeated drops.

Corning Gorilla Glass is manufactured in Kentucky, South Korea, Japan and Taiwan.

Semiconductor optics manufactured by Corning includes high-performance optical material products, optical-based metrology instruments, and optical assemblies for applications in the global semiconductor industry. Corning's semiconductor optics products are manufactured in New York.

Other specialty glass products include glass lens and window components and assemblies and are made in New York, New Hampshire and France, and sourced from China.

Patent protection is important to the segment's operations. The segment has a growing portfolio of patents relating to its products, technologies and manufacturing processes. Brand recognition and loyalty, through well-known trademarks, are important to the segment. Refer to the material under the heading "Patents and Trademarks" for information relating to the Company's patents and trademarks.

The Specialty Materials segment represented approximately 13% of Corning's segment net sales in 2018.

Environmental Technologies Segment

Corning's Environmental Technologies segment manufactures ceramic substrates and filter products for emissions control in mobile applications around the world. In the early 1970s, Corning developed an economical, high-performance cellular ceramic substrate that is now the standard for catalytic converters in vehicles worldwide. As global emissions control regulations tighten, Corning has continued to develop more effective and durable ceramic substrate and filter products for gasoline and diesel applications. For example, in response to the growing popularity of gasoline direct injection engines, Corning introduced gasoline particulate filters to help automakers reduce particulate emissions generated by these engines. Corning manufactures substrate and filter products in New York, Virginia, China, Germany and South Africa. Corning sells its ceramic substrate and filter products worldwide to catalyzers and manufacturers of emission control systems who then sell to automotive and diesel vehicle or engine manufacturers. Although most sales are made to the emission control systems manufacturers, the use of Corning substrates and filters is generally required by the specifications of the automotive and diesel vehicle or engine manufacturers.

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Patent protection is important to the segment's operations. The segment has an extensive portfolio of patents relating to its products, technologies and manufacturing processes. Corning is licensed to use certain patents owned by others, which are also considered important to the segment's operations. Refer to the material under the heading "Patents and Trademarks" for information relating to the Company's patents and trademarks.

The Environmental Technologies segment represented 11% of Corning's segment net sales in 2018.

Life Sciences Segment

As a leading developer, manufacturer and global supplier of laboratory products for over 100 years, Corning's Life Sciences segment works with researchers and drug manufacturers seeking to increase efficiencies, reduce costs and compress timelines. Using unique expertise in the fields of materials science, polymer surface science, cell culture and biology, the segment provides innovative solutions that improve productivity and enable breakthrough research.

Life Sciences products include consumables (such as plastic vessels, specialty surfaces, cell culture media and serum), as well as general labware and equipment, that are used for advanced cell culture research, bioprocessing, genomics, drug discovery, microbiology and chemistry. Corning sells life sciences products under these primary brands: Corning, Falcon, Pyrex and Axygen. The products are marketed globally, primarily through distributors, to pharmaceutical and biotechnology companies, academic institutions, hospitals, government entities, and other facilities. Corning manufactures these products in the United States in California, Illinois, Maine, Massachusetts, New York, North Carolina, Utah and Virginia and outside of the U.S. in China, France, Mexico and Poland.

Patent protection is important to the segment's operations. The segment has a growing portfolio of patents relating to its products, technologies and manufacturing processes. Brand recognition and loyalty, through well-known trademarks, are important to the segment. Refer to the material under the heading "Patents and Trademarks" for more information.

The Life Sciences segment represented 8% of Corning's segment net sales in 2018.

All Other

All other segments that do not meet the quantitative threshold for separate reporting have been grouped as “All Other.” This group is primarily comprised of the results of the pharmaceutical technologies business and new product lines and development projects, as well as certain corporate investments such as Eurokera and Keraglass equity affiliates.

The All Other segment represented 2% of Corning’s segment net sales in 2018.

Additional explanation regarding Corning and its five reportable segments, as well as financial information about geographic areas, is presented in Management’s Discussion and Analysis of Financial Condition and Results of Operations and Note 17 (Reportable Segments) to the Consolidated Financial Statements.

Corporate Investments

Dow Corning Corporation and Hemlock Semiconductor Group (“HSG”). Prior to May 31, 2016, Corning and The Dow Chemical Company (“Dow Chemical”) each owned half of Dow Corning Corporation (“Dow Corning”), an equity company headquartered in Michigan that manufactures silicone products worldwide. Dow Corning was the majority-owner of HSG, a market leader in the production of high purity polycrystalline silicon for the semiconductor and solar energy industries.

On May 31, 2016, Corning completed the strategic realignment of its equity investment in Dow Corning pursuant to the Transaction Agreement announced in December 2015. Under the terms of the Transaction Agreement, Corning exchanged with Dow Corning its 50% stock interest in Dow Corning for 100% of the stock of a newly formed entity, which held an equity interest in HSG and approximately $4.8 billion in cash.

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Prior to realignment, HSG, a consolidated subsidiary of Dow Corning, was an indirect equity investment of Corning. Upon completion of the exchange, Corning now has a direct equity investment in HSG. Because our ownership percentage in HSG did not change as a result of the realignment, the investment in HSG is recorded at its carrying value, which had a negative carrying value of $383 million at the transaction date. The negative carrying value resulted from a one-time charge to this entity in 2014 for the permanent abandonment of certain assets. Excluding this charge, the entity is profitable and recovered its equity during 2018.

Pittsburgh Corning Corporation. Prior to the second quarter of 2016, Corning and PPG Industries, Inc. each owned 50% of the capital stock of Pittsburgh Corning Corporation ("PCC"). PCC filed for Chapter 11 reorganization in 2000 and the Modified Third Amended Plan of Reorganization for PCC (the "Plan") became effective in April 2016. In the second quarter of 2016, Corning contributed its equity interests in PCC and Pittsburgh Corning Europe N.V. as required by the Plan and recognized a gain of $56 million for the difference between the fair value of the asbestos litigation liability and carrying value of the investment.

Additional information about corporate investments is presented in Note 5 (Investments) to the Consolidated Financial Statements.

Competition

Corning competes with many large and varied manufacturers, both domestic and foreign. Some of these competitors are larger than Corning, and some have broader product lines. Corning strives to maintain and improve its market position through technology and product innovation. For the foreseeable future, Corning believes its competitive advantage lies in its commitment to research and development, its commitment to reliability of supply and product quality and technical specification of its products. There is no assurance that Corning will be able to maintain or improve its market position or competitive advantage.

Display Technologies Segment

Corning is the largest worldwide producer of glass substrates for high performance display glass. The environment for high performance display glass substrate products is very competitive and Corning believes it has maintained its competitive advantages by investing in new products, providing a consistent and reliable supply, and continually improving its proprietary fusion manufacturing process. This process allows us to deliver glass that is larger, thinner and lighter, with exceptional surface quality and without heavy metals. Asahi Glass Co. Ltd. and Nippon Electric Glass Co. Ltd. are Corning's principal competitors in display glass substrates.

Optical Communications Segment

Corning believes it maintains a leadership position in the segment's principal product groups, which include carrier and enterprise networks. The competitive landscape includes industry consolidation, price pressure and competition for the innovation of new products. These competitive conditions are likely to persist. Corning believes its large-scale manufacturing experience, fiber process, technology leadership and intellectual property provide cost advantages relative to several of its competitors.

The primary competing producers of the Optical Communications segment are CommScope and Prysmian Group.

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Specialty Materials Segment

Corning has deep capabilities in materials science, optical design, shaping, coating, finishing, metrology, and system assembly. Additionally, we are addressing emerging needs of the consumer electronics industry with the development of chemically strengthened glass. Corning Gorilla Glass is a thin-sheet glass that is better able to survive events that most commonly cause glass failure. Its advanced composition allows a deeper layer of chemical strengthening than is possible with most other chemically strengthened glasses, making it both durable and damage resistant. Our products and capabilities in this segment position the Company to meet the needs of a broad array of markets including display, semiconductor, aerospace/defense, astronomy, vision care, industrial/commercial, and telecommunications. For this segment, Schott, Asahi Glass Co. Ltd., Nippon Electric Glass Co. Ltd. and Heraeus are the main competitors.

Environmental Technologies Segment

Corning believes it maintains a strong position in the worldwide market for automotive ceramic substrate and filter products, as well as in the heavy-duty and light-duty diesel vehicle markets. The Company believes its competitive advantage in automotive ceramic substrate products for catalytic converters and filter products for particulate emissions in exhaust systems is based on an advantaged product portfolio, collaborative engineering design services, customer service and support, strategic global presence and continued product innovation. Corning's Environmental Technologies products face principal competition from NGK Insulators, Ltd. and Ibiden Co. Ltd.

Life Sciences Segment

Corning seeks to maintain a competitive advantage by emphasizing product quality, global distribution, supply chain efficiency, a broad product line and superior product attributes. Our principal competitors include Thermo Fisher Scientific, Inc., Greiner Group AG, Eppendorf AG and Starstedt AG. Corning also faces increasing competition from large distributors that have pursued backward integration or introduced private label products.

Raw Materials

Corning's manufacturing processes and products require access to uninterrupted power sources, significant quantities of industrial water, certain precious metals, and various batch materials. Availability of resources (ores, minerals, polymers, helium and processed chemicals) required in manufacturing operations, appears to be adequate. Corning's suppliers, from time to time, may experience capacity limitations in their own operations, or may eliminate certain product lines. Corning believes it has adequate programs to ensure a reliable supply of raw and batch materials as well as precious metals. For many of its materials, Corning has alternate suppliers that would allow operations to continue without interruption in the event of specific materials shortages.

Certain key materials and proprietary equipment used in the manufacturing of products are currently sole-sourced or available only from a limited number of suppliers. To minimize this risk, Corning closely monitors raw materials and equipment with limited availability or which are sourced through one supplier. However, any future difficulty in obtaining sufficient and timely delivery of components and/or raw materials could result in lost sales due to delays or reductions in product shipments, or reductions in Corning's gross margins.

Patents and Trademarks

Inventions by members of Corning's research and engineering staff continue to be important to the Company's growth. Patents have been granted on many of these inventions in the United States and other countries. Some of these patents have been licensed to other manufacturers. Many of our earlier patents have now expired, but Corning continues to seek and obtain patents protecting its innovations. In 2018, Corning was granted about 520 patents in the U.S. and over 1,430 patents in countries outside the U.S.

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Each business segment possesses a patent portfolio that provides certain competitive advantages in protecting Corning's innovations. Corning has historically enforced, and will continue to enforce, its intellectual property rights. At the end of 2018, Corning and its wholly-owned subsidiaries owned over 11,600 unexpired patents in various countries of which over 4,400 were U.S. patents. Between 2019 and 2021, approximately 11% of these patents will expire, while at the same time Corning intends to seek patents protecting its newer innovations. Worldwide, Corning has about 10,300 patent applications in process, with about 2,500 in process in the U.S. Corning believes that its patent portfolio will continue to provide a competitive advantage in protecting the Company's innovation, although Corning's competitors in each of its businesses are actively seeking patent protection as well.

While each of our reportable segments has numerous patents in various countries, no one patent is considered material to any of these segments. Important U.S.-issued patents in our reportable segments include the following:

- Display Technologies: patents relating to glass compositions and methods for the use and manufacture of glass substrates for display applications.
- Optical Communications: patents relating to (i) optical fiber products including low-loss optical fiber, high data rate optical fiber, and dispersion compensating fiber, and processes and equipment for manufacturing optical fiber, including methods for making optical fiber preforms and methods for drawing, cooling and winding optical fiber; (ii) optical fiber ribbons and methods for making such ribbon, fiber optic cable designs and methods for installing optical fiber cable; (iii) optical fiber connectors, hardware, termination and storage and associated methods of manufacture; and (iv) distributed communication systems.
- Environmental Technologies: patents relating to cellular ceramic honeycomb products, together with ceramic batch and binder system compositions, honeycomb extrusion and firing processes, and honeycomb extrusion dies and equipment for the high-volume, low-cost manufacture of such products.
- Specialty Materials: patents relating to protective cover glass, ophthalmic glasses and polarizing dyes, and semiconductor/microlithography optics and blanks, metrology instrumentation and laser/precision optics, glass polarizers, specialty fiber, and refractories.
- Life Sciences: patents relating to methods and apparatus for the manufacture and use of scientific laboratory equipment including multiwell plates and cell culture products, as well as equipment and processes for label independent drug discovery.

Products reported in All Other include development projects, new product lines, and other businesses or investments that do not meet the threshold for separate reporting.

Approximate number of patents granted to our reportable segments follows:

	Number of patents worldwide	U.S. patents	Important patents expiring between 2019 and 2021
Display Technologies	1,700	340	6
Optical Communications	5,060	2,340	27
Environmental Technologies	1,100	380	14
Specialty Materials	1,600	680	7
Life Sciences	560	240	1

Many of the Company's patents are used in operations or are licensed for use by others, and Corning is licensed to use patents owned by others. Corning has entered into cross-licensing arrangements with some major competitors, but the scope of such licenses has been limited to specific product areas or technologies.

Corning's principal trademarks include the following: Axygen, Corning, Celcor, ClearCurve, DuraTrap, Eagle XG, EDGE8, Gorilla, HPFS, LEAF, PYREX, Steuben, Falcon, SMF-28e, UniCam, Valor, Willow, LOTUS and IRIS.

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Protection of the Environment

Corning has an extensive program to ensure that its facilities are in compliance with state, federal and foreign pollution-control regulations. This program has resulted in capital and operating expenditures each year. To maintain compliance with such regulations, capital expenditures for pollution control in operations were approximately $11.3 million in 2018 and are estimated to be $21.1 million in 2019.

Corning's 2018 consolidated operating results were charged with approximately $47 million for depreciation, maintenance, waste disposal and other operating expenses associated with pollution control. Corning believes that its compliance program does not place it at a competitive disadvantage.

Employees

At December 31, 2018, Corning had approximately 51,500 full-time employees. From time to time, Corning also retains consultants, independent contractors, temporary and part-time workers.

Executive Officers of the Registrant

James P. Clappin Executive Vice President, Corning Glass Technologies

Mr. Clappin joined Corning in 1980 as a process engineer. He transitioned to GTE Corporation in 1983 and returned to Corning in 1988. He held a variety of manufacturing management roles in the consumer products division, transferring to the display business in 1994. He was appointed as general manager of Corning Display Technologies (CDT) in 2002, and was president of CDT from September 2005 to July 2010. He was appointed president, Corning Glass Technologies, in 2010. He was appointed to his present position in 2017. Age 61.

Martin J. Curran Executive Vice President and Corning Innovation Officer

Mr. Curran joined Corning in 1984 and has held a variety of roles in finance, manufacturing, and marketing. He has served as senior vice president, general manager for Corning Cable Systems Hardware and Equipment Operations in the Americas, responsible for operations in Hickory, North Carolina; Keller, Texas; Reynosa, Mexico; Shanghai, China; and the Dominican Republic. He has also served as senior vice president and general manager for Corning Optical Fiber. Mr. Curran was appointed as Corning's first innovation officer in August 2012. Age 60.

Jeffrey W. Evenson   Executive Vice President and Chief Strategy Officer

Dr. Evenson joined Corning in 2011 as senior vice president and operations chief of staff. In 2015, he was named Chief Strategy Officer. He serves on the Management Committee and oversees corporate strategy, corporate communications, and advanced analytics. Prior to joining Corning, Dr. Evenson was a senior vice president with Sanford C. Bernstein, where he served as a senior analyst. Before that, Dr. Evenson was a partner at McKinsey & Company, where he led technology and market assessment for early-stage technologies. He was appointed executive vice president in 2018. Age 53.

Clark S. Kinlin   Executive Vice President

Mr. Kinlin joined Corning in 1981 in the Specialty Materials division. From 1985 to 1995 he worked in the Optical Fiber division. In 1995, he joined Corning Consumer Products. In 2000, Mr. Kinlin was named president, Corning International Corporation and, in 2003, he was appointed as general manager for Greater China. From April 2007 to March 2008, he was chief operating officer, Corning Cable Systems, (now Corning Optical Communications) with responsibility for global sales, marketing, and operations. He was named president and chief executive officer of Corning Cable Systems in April 2008. He was appointed executive vice president in 2012. Age 59.

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Lawrence D. McRae   Vice Chairman and Corporate Development Officer

Mr. McRae joined Corning in 1985 and has held a broad range of leadership positions in various finance, sales, marketing, and general management across Corning's businesses. He was appointed vice president Corporate Development in 2000, senior vice president Corporate Development in 2003, senior vice president Strategy and Corporate Development in 2005, and executive vice president Strategy and Corporate Development in 2010. Mr. McRae has served on Corning's management committee since 2002 and was named vice chairman in 2015. Age 60.

David L. Morse   Executive Vice President and Chief Technology Officer

Dr. Morse joined Corning in 1976 as a composition scientist in glass research. In 1985, he was named senior research associate, manager of consumer products development in 1987 and director of materials research in 1990. He served in a variety of technology leadership positions in organic materials and telecommunications before joining corporate research in 2001. Prior to his current role, he served as senior vice president and director, corporate research. Dr. Morse was appointed to his current position in 2012. He is a member of the National Academy of Engineering. Age 66.

Eric S. Musser   Executive Vice President, Corning Technologies and International

Mr. Musser joined Corning in 1986 and served in a variety of manufacturing and general management roles in Corning's optical communications businesses. In 2005, he was named vice president and general manager of Optical Fiber. Mr. Musser served as general manager, Corning Greater China 2007-2012 and president of Corning International 2012-2014. He was appointed executive vice president in 2014. Age 59.

Christine M. Pambianchi   Executive Vice President, People and Digital

Ms. Pambianchi joined Corning in 2000 as division human resource manager, Corning Optical Fiber, and later was named director, Human Resources, Corning Optical Communications. She was named division vice president, Business Human Resource in 2004. She has led the Human Resources function since January 2008 when she was named vice president, Human Resources. Ms. Pambianchi was appointed as senior vice president, Human Resources, in 2010 and to her current role in 2018. Age 50.

Edward A. Schlesinger   Senior Vice President and Corporate Controller

Mr. Schlesinger joined Corning in 2013 as senior vice president and chief financial officer of Corning Optical Communications. He was elected vice president and corporate controller in September 2015 and principal accounting officer in December 2015. He was named senior vice president in February 2019. Prior to joining Corning, Mr. Schlesinger served as Vice President, Finance and Sector Chief Financial Officer for the Climate Solutions Sector for Ingersoll Rand. Mr. Schlesinger has a financial career that spans more than 20 years garnering extensive expertise in technical financial management and reporting. Age 51.

Lewis A. Steverson   Executive Vice President and General Counsel

Mr. Steverson joined Corning in 2013 as senior vice president and general counsel. Prior to joining Corning, Mr. Steverson served as senior vice president, general counsel, and corporate secretary of Motorola Solutions, Inc. During his 18 years with Motorola, he held a variety of law leadership roles across the company's numerous business units. Prior to Motorola, Mr. Steverson was in private practice at the law firm of Arnold & Porter. He was appointed executive vice president in 2018. Age 55.

R. Tony Tripeny   Executive Vice President and Chief Financial Officer

Mr. Tripeny joined Corning Cable Systems in 1985 as the corporate accounting manager and became the Keller, Texas facility's plant controller in 1989. In 1993, he was appointed equipment division controller and, in 1996, corporate controller. Mr. Tripeny was appointed chief financial officer of Corning Cable Systems in July 2000 and, in 2003, he took on the additional role of group controller, Telecommunications. He was appointed division vice president, operations controller in August 2004, vice president, corporate controller in October 2005, and senior vice president and principal accounting officer in April 2009. Mr. Tripeny was then appointed as Corning's senior vice president and chief financial officer in September 2015. He was appointed executive vice president in 2018. Age 59.

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Wendell P. Weeks Chairman, Chief Executive Officer and President

Mr. Weeks joined Corning in 1983 in the finance group. He has held a variety of financial, business development, commercial, and general management roles. In 1993 he was named general manager of external development in Corning's telecommunications business. He was named vice president and general manager of the Optical Fiber business in 1996 and president, Corning Optical Communications in 2001. Mr. Weeks has been a member of Corning's Board of Directors since December 2000. He became Corning's president and chief operating officer in 2002. He was named chief executive officer in April 2005 and chairman of the board in April 2007. He added the title of president in 2010. Mr. Weeks is a director of Merck & Co. Inc. and Amazon.com, Inc. Age 59.

Document Availability

A copy of Corning's 2018 Annual Report on Form 10-K filed with the Securities and Exchange Commission is available upon written request to Corporate Secretary, Corning Incorporated, One Riverfront Plaza, Corning, NY 14831. The Annual Report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments pursuant to Section 13(a) or 15(d) of the Exchange Act of 1934 and other filings are available as soon as reasonably practicable after such material is electronically filed or furnished to the SEC, and can be accessed electronically free of charge at www.SEC.gov, or through the Investor Relations page on Corning's website at www.corning.com. The information contained on the Company's website is not included in, or incorporated by reference into, this Annual Report on Form 10-K.

Other

Additional information in response to Item 1 is found in Note 17 (Reportable Segments) to the Consolidated Financial Statements and in Item 6 (Selected Financial Data).

Item 1A. Risk Factors

We operate in rapidly changing economic, political, and technological environments that present numerous risks. Our operations and financial results are subject to risks and uncertainties, including those described below, that could adversely affect our business, financial condition, results of operations, cash flows, our ability to successfully execute our strategy and capital allocation framework, and the trading price of our common stock or debt. The following discussion identifies the most significant factors that may adversely affect our business, operations, financial position or future financial performance. This information should be read in conjunction with our MD&A and the consolidated financial statements and related notes incorporated by reference into this report. The following discussion of risks is not all inclusive but is designed to highlight what we believe are important factors to consider, as these factors could cause our future results to differ from those in our forward-looking statements and from historical trends.

As a global company, we face many risks which could adversely impact our operations and financial results

We are a global company and derive a substantial portion of our revenues from, and have significant operations, outside of the United States. Our international operations include manufacturing, assembly, sales, research and development, customer support, and shared administrative service centers. Additionally, we rely on a global supply chain for key components and capabilities that are central to our ability to invent, make and sell products.

Compliance with laws and regulations increases our costs. We are subject to both U.S. laws and local laws which, among other things, include data privacy requirements, employment and labor laws, tax laws, anti-competition regulations, prohibitions on payments to governmental officials, import and trade restrictions and export requirements. Non-compliance or violations could result in fines, criminal sanctions against us, our officers or employees, and prohibitions on the conduct of our business. Such violations could result in prohibitions on our ability to offer our products and services in one or more countries and could also materially damage our reputation, our brand, our international expansion efforts, our ability to attract and retain employees, our business and operating results. Our success depends, in part, on our ability to anticipate and manage these risks.

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We are also subject to a variety of other risks in managing a global organization, including those related to:

- The economic and political conditions in each country or region;
- Complex regulatory requirements affecting international trade and investment, including anti-dumping laws, export controls, the Foreign Corrupt Practices Act and local laws prohibiting improper payments. Our operations may be adversely affected by changes in the substance or enforcement of these regulatory requirements, and by actual or alleged violations of them;
- Fluctuations in currency exchange rates, convertibility of currencies and restrictions involving the movement of funds between jurisdictions and countries;
- Governmental protectionist policies and sovereign and political risks that may adversely affect Corning's profitability and assets;
- Tariffs, trade duties and other trade barriers including anti-dumping duties;
- Geographical concentration of our factories and operations, and regional shifts in our customer base;
- Periodic health epidemic concerns;
- Political unrest, confiscation or expropriation of assets by foreign governments, terrorism and the potential for other hostilities;
- Difficulty in protecting intellectual property, sensitive commercial and operations data, and information technology systems;
- Differing legal systems, including protection and treatment of intellectual property and patents;
- Complex, or competing tax regimes;
- Difficulty in collecting obligations owed to us;
- Natural disasters such as floods, earthquakes, tsunamis and windstorms; and
- Potential loss of utilities or other disruption affecting manufacturing.

Corning's Display Technologies segment generates a significant amount of the Company's profits and cash flow. Any significant decrease in display glass pricing could have a material and negative impact on our financial results

Corning's ability to generate profits and operating cash flow depends largely on the profitability of our display glass business, which is subject to continuous pricing pressure due to industry competition, potential over-capacity, and development of new technologies. If we are not able to achieve proportionate reductions in costs and increases in volume to offset potential pricing pressures it could have a material adverse impact on our financial results.

Because we have a concentrated customer base in each of our businesses, our sales could be negatively impacted by the actions or insolvency of one or more key customers, as well as our ability to retain these customers

A relatively small number of end-customers accounted for a high percentage of net sales in each of our reportable segments. Mergers and consolidations between customers could result in further concentration of Corning's customer base. Further concentration, or the loss or insolvency of a key customer, could result in a substantial loss of sales and reduction in anticipated in cash flows.

The following table details the number of combined customers of our segments that accounted for a large percentage of segment net sales:

	Number of combined customers	% of total segment net sales in 2018
Display Technologies	4	70%
Optical Communications	1	18%
Specialty Materials	3	58%
Environmental Technologies	3	78%
Life Sciences	2	44%

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Business disruptions could affect our operating results

A major earthquake, fire or other catastrophic event that results in the destruction or disruption of any of our critical facilities could severely affect our ability to conduct normal business operations and, as a result, our future financial results could be materially and adversely affected. For example, certain manufacturing sites require high quality, continuous, and uninterrupted power and access to industrial water. Unplanned outages could have a material negative impact on our operations and ability to supply our customers.

Additionally, a significant amount of the specialized manufacturing capacity for our reportable segments is concentrated in single-site locations. Due to the specialized nature of the assets, in the event such a location experiences disruption, it may not be possible to find replacement capacity quickly or substitute production from other facilities. Accordingly, disruption at a single-site manufacturing operation could significantly impact Corning's ability to supply its customers and could produce a near-term severe impact on our individual businesses and the Company as a whole.

Geopolitical events, as well as other events outside of Corning's control, could cause a disruption to our manufacturing operations and adversely impact our customers, resulting in a negative impact to Corning's net sales, net income, asset values and liquidity

A natural disaster, epidemic, labor strike, war or political unrest in regions where we operate could adversely affect Corning's ability to supply our customers and impact the value of our assets. Such events may also impact our customers' facilities and reduce our sales to such customers. For example, a sizeable portion of Corning's glass manufacturing capacity is in South Korea and we generate a significant portion of our sales through two South Korean customers. Deterioration of the geopolitical climate in such a region could cause a disruption to our manufacturing operations and adversely impact our customers, resulting in a negative impact to Corning's net sales, net income, asset values and liquidity.

We may experience difficulties in enforcing our intellectual property rights, which could result in loss of market share, and we may be subject to claims of infringement of the intellectual property rights of others

We rely on patent and trade secret laws, copyright, trademark, confidentiality procedures, controls and contractual commitments to protect our intellectual property rights. Despite our efforts, these protections may be limited and we may encounter difficulties in protecting our intellectual property rights or obtaining rights to additional intellectual property necessary to permit us to continue or expand our businesses. We cannot provide assurance that the patents that we hold or may obtain will provide meaningful protection against our competitors. Changes in or enforcement of laws concerning intellectual property may affect our ability to prevent or address the misappropriation of, or the unauthorized use of, our intellectual property, potentially resulting in loss of market share. Litigation may be necessary to enforce our intellectual property rights. Litigation is inherently uncertain and outcomes are often unpredictable. If we cannot protect our intellectual property rights against unauthorized copying or use, or other misappropriation, we may not remain competitive.

The intellectual property rights of others could inhibit our ability to introduce new products. Other companies hold patents on technologies used in our industries and are aggressively seeking to expand, enforce and license their patent portfolios. We periodically receive notices from, or have lawsuits filed against us by third parties claiming infringement, misappropriation or other misuse of their intellectual property rights and/or breach of our agreements with them. These third parties often include entities that do not have the capabilities to design, manufacture, or distribute products or that acquire intellectual property like patents for the sole purpose of monetizing their acquired intellectual property through asserting claims of infringement and misuse. Such claims of infringement or misappropriation may result in loss of revenue, substantial costs, or lead to monetary damages or injunctive relief against us.

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Information technology dependency and cyber security vulnerabilities could lead to reduced revenue, liability claims, or competitive harm

The Company is dependent on information technology systems and infrastructure, including cloud-based services, ("IT systems") to conduct its business. Our IT systems may be vulnerable to disruptions from human error, outdated applications, computer viruses, natural disasters, unauthorized access, cyber-attack and other similar disruptions. Any significant disruption, breakdown, intrusion, interruption or corruption of these systems or data breaches could cause the loss of data or intellectual property, equipment damage, downtime, and/or safety related issues and could have a material adverse effect on our business. Like other global companies, we have, from time to time, experienced incidents related to our IT systems, and expect that such incidents will continue, including malware and computer virus outbreaks, unauthorized access, systems failures and disruptions. We have measures and defenses in place against such events, but we may not be able to prevent, immediately detect, or remediate all instances of such events. A material security breach or disruption of our IT systems could result in theft, unauthorized use, or publication of our intellectual property and/or confidential business information, harm our competitive position, disrupt our manufacturing, reduce the value of our investment in research and development and other strategic initiatives, impair our ability to access vendors, suppliers and cloud-based services, or otherwise adversely affect our business.

Additionally, we believe that utilities and other operators of critical infrastructure that serve our facilities face heightened security risks, including cyber-attack. In the event of such an attack, disruption in service from our utility providers could disrupt our manufacturing operations which rely on a continuous source of power (electrical, gas, etc.).

We may not earn a positive return from our research, development and engineering investments

Developing our products through our innovation model of research and development is expensive and often involves a long investment cycle. We make significant expenditures and investments in research, development and engineering that may not earn an economic return. If our investments do not provide a pipeline of products or technologies that our customers demand or lower our manufacturing costs, it could negatively impact our revenues and operating margins both near- and long-term.

We have significant exposure to foreign currency movements

A large portion of our sales, profit and cash flows are transacted in non-U.S. dollar currencies and we expect that we will continue to experience fluctuations in the US Dollar value of these activities if it is not possible or cost effective to hedge our currency exposures or should we elect not to hedge certain currency exposures. Alternatively, we may experience gains or losses if the underlying exposure which we have hedged changes (increases or decreases) and we are unable to reverse, unwind, or terminate the hedges concurrent with changes in the underlying notional exposure.

Our ultimate realized loss or gain with respect to currency fluctuations will generally depend on the size and type of cross-currency exposures that we have, the exchange rates associated with these exposures and changes in those rates, whether we have entered into foreign currency contracts to offset these exposures and other factors.

Our hedge portfolio may reduce our ability to respond to price moves by our Display Technologies segment competitors. Foreign currency movements may impact our competitive cost position relative to our largest, Japan-based competitors in the Display Technologies segment. The profitability of customers may also be impacted as they typically purchase from us in Japanese yen and they sell in various currencies.

These factors could materially impact our results of operations, anticipated future results, financial position and cash flows, the timing of which is variable and generally outside of our control.

We may have significant exposure to counterparties of our related derivatives portfolio

We maintain a significant portfolio of over the counter derivatives to hedge our projected currency exposure to the Japanese yen, New Taiwan dollar, South Korean won, Chinese yuan and euro. We are exposed to potential losses in the event of non-performance by our counterparties to these derivative contracts. Any failure of a counterparty to pay on such a contract when due could materially impact our results of operations, financial position, and cash flows.

If we are unable to obtain certain specialized equipment, raw and batch materials or natural resources required in our products or processes, our business will suffer

Our ability to meet customer demand depends, in part, on our ability to obtain timely and adequate delivery of equipment, parts, components and raw materials from our suppliers. We may experience shortages that could adversely affect our operations. Certain manufacturing equipment, components and raw materials are available only from single or limited sources, and we may not be able to find alternate sources in a timely manner. A reduction, interruption or delay of supply, or a significant increase in the price for supplies, such as manufacturing equipment, precious metals, raw materials, utilities including energy and industrial water, could have a material adverse effect on our businesses.

We use specialized raw materials from single-source suppliers (e.g., specific mines or quarries) and natural resources (e.g., helium) in certain products and processes. If a supplier is unable to provide the required raw materials or the natural resource is in scarce supply or not readily available, we may be unable to change our product composition or manufacturing process to prevent disruption to our business.

We have incurred, and may in the future incur, goodwill and other intangible asset impairment charges

At December 31, 2018, Corning had goodwill and other intangible assets of approximately $3.2 billion. While we believe the estimates and judgments about future cash flows used in the goodwill impairment tests are reasonable, we cannot provide assurance that additional impairment charges in the future will not be required if the expected cash flow as projected by management do not occur, especially if an economic downturn occurs and continues for a lengthy period or becomes severe, or if the Company’s acquisitions and investments fail to achieve expected returns.

Changes in our effective tax rate or tax liability may have an adverse effect on our results of operations

Our effective tax rate could be adversely impacted by several factors, including:

- Changes in the relative amounts of income before taxes in the various jurisdictions in which we operate;
- Changes in tax laws, tax treaties and regulations or the interpretation of them, including the impact of the Tax Cuts and Jobs Act (the "2017 Tax Act") which was passed by the U.S. Congress and signed into law on December 22, 2017;
- Changes to our assessment about the realizability of our deferred tax assets that are based on estimates of our future results, the prudence and feasibility of possible tax planning strategies, and the economic and political environments in which we do business;
- The outcome of current and future tax audits, examinations, or administrative appeals;
- Changes in generally accepted accounting principles that affect the accounting for taxes; and
- Limitations or adverse findings regarding our ability to do business in some jurisdictions.

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We may have additional tax liabilities

We are subject to income taxes in the U.S. and many foreign jurisdictions, and are commonly audited by various tax authorities. In the ordinary course of our business, there are many transactions and calculations where the ultimate tax determination is uncertain. Significant judgment is required in determining our worldwide provision for income taxes. Although we believe our tax estimates are reasonable, the final determination of tax audits and any related litigation could be materially different from our historical income tax provisions and accruals. The results of an audit or litigation could have a material effect on our financial statements in the period or periods for which that determination is made.

The 2017 Tax Act significantly impacted how U.S. global corporations are taxed. Among other things, the 2017 Tax Act required companies to pay a one-time mandatory tax on unrepatriated earnings of certain foreign subsidiaries that were previously tax deferred (the "toll charge") and created new taxes on certain foreign sourced earnings. Significant guidance has been issued with the intention of clarifying the new tax provisions. To date, a considerable amount of this guidance has been issued in the form of proposed regulations. The volume and complexity of the proposed regulations as well as the impact of final regulations which were recently issued, has resulted in many questions regarding how the effect of such regulations should be considered. We continue to evaluate the impact of this legislation and certain changes could have a material adverse impact on our tax expense and cash flow.

Our innovation model depends on our ability to attract and retain specialized experts in our core technologies

Our innovation model requires us to employ highly specialized experts in glass science, ceramic science, and optical physics to conduct our research and development and engineer our products and design our manufacturing facilities. The loss of the services of any member of our key research and development or engineering team without adequate replacement, or the inability to attract new qualified personnel, could have a material adverse effect on our operations and financial performance.

We are subject to strict environmental regulations and regulatory changes that could result in fines or restrictions that interrupt our operations

Some of our manufacturing processes generate chemical waste, waste water, other industrial waste or greenhouse gases, and we are subject to numerous laws and regulations relating to the use, storage, discharge and disposal of such substances. We have installed anti-pollution equipment for the treatment of chemical waste and waste water at our facilities. We have taken steps to control the amount of greenhouse gases created by our manufacturing operations. However, we cannot provide assurance that environmental claims will not be brought against us or that government regulators will not take steps to adopt more stringent environmental standards.

Any failure on our part to comply with any present or future environmental regulations could result in the assessment of damages or imposition of fines against us, or the suspension/cessation of production or operations. In addition, environmental regulations could require us to acquire costly equipment, incur other significant compliance expenses or limit or restrict production or operations and thus materially and negatively affect our financial condition and results of operations.

Changes in regulations and the regulatory environment in the U.S. and other countries, such as those resulting from the regulation and impact of global warming and CO_2 abatement, may affect our businesses and their results in adverse ways by, among other things, substantially increasing manufacturing costs, limiting availability of scarce resources, especially energy, or requiring limitations on production and sale of our products or those of our customers.

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Current or future litigation or regulatory investigations may harm our financial condition or results of operations

As a global technology and manufacturing company, we are engaged in various litigation and regulatory matters. Litigation and regulatory proceedings may be uncertain, and adverse rulings could occur, resulting in significant liabilities, penalties or damages. Such current or future substantial legal liabilities or regulatory actions could have a material adverse effect on our business, financial condition, cash flows and reputation.

Our global operations are subject to extensive trade and anti-corruption laws and regulations

Due to the international scope of our operations, we are subject to a complex system of import- and export-related laws and regulations, including U.S. regulations issued by Customs and Border Protection, the Bureau of Industry and Security, the Office of Anti-boycott Compliance, the Directorate of Defense Trade Controls and the Office of Foreign Assets Control, as well as the counterparts of these agencies in other countries. Any alleged or actual violation by an employee or the Company may subject us to government scrutiny, investigation and civil and criminal penalties, and may limit our ability to import or export our products or to provide services outside the United States. We cannot predict the nature, scope or effect of future regulatory requirements to which our operations might be subject or the way existing laws might be administered or interpreted.

In addition, the U.S. Foreign Corrupt Practices Act and similar foreign anti-corruption laws generally prohibit companies and their intermediaries from making improper payments or providing anything of value to improperly influence foreign government officials for the purpose of obtaining or retaining business, or obtaining an unfair advantage. Recent years have seen a substantial increase in the global enforcement of anti-corruption laws. Our continued operation and expansion outside the United States, including in developing countries, could increase the risk of alleged violations. Violations of these laws may result in severe criminal or civil sanctions, could disrupt our business, and result in an adverse effect on our reputation, business and results of operations or financial condition.

Moreover, several of our related partners are domiciled in areas of the world with laws, rules and business practices that differ from those in the United States, and we face the reputational and legal risk that our related partners may violate applicable laws, rules and business practices.

International trade policies may negatively impact our ability to sell and manufacture our products outside of the U.S.

Government policies on international trade and investment such as import quotas, tariffs, and capital controls, whether adopted by individual governments or addressed by regional trade blocs, can affect the demand for our products and services, impact the competitive position of our products or prevent us (including our equity affiliates/joint ventures) from being able to sell and/or manufacture products in certain countries. The implementation of more restrictive trade policies, such as higher tariffs or new barriers to entry, in countries in which we sell large quantities of products and services could negatively impact our business, results of operations and financial condition. For example, a government's adoption of "buy national" policies or retaliation by another government against such policies could have a negative impact on our results of operations. These policies also affect our equity companies.

Item 1B. Unresolved Staff Comments

None.

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Item 2. Properties

Corning operates 108 manufacturing plants and processing facilities in 15 countries, of which approximately 35% are in the U.S. We own 64% of our executive and corporate buildings of which 80% are located in and around Corning, New York. The Company also owns over 68% of our sales and administrative office square footage, 86% of our research and development square footage, 72% of our manufacturing square footage, and over 10% of our warehousing square footage.

For the years ended 2018, 2017 and 2016, we invested a total of $5.2 billion, primarily in facilities outside of the United States.

Manufacturing, sales and administrative, and research and development facilities have an aggregate floor space of approximately 43.2 million square feet. Distribution of this total area follows:

(million square feet)	Total	Domestic	Foreign
Manufacturing	35.5	9.0	26.5
Sales and administrative	2.6	1.8	0.8
Research and development	2.3	1.9	0.4
Warehouse	2.8	2.4	0.4
Total	43.2	15.1	28.1

Total assets and capital expenditures by operating segment are included in Note 17 (Reportable Segments) to the Consolidated Financial Statements. Information concerning lease commitments is included in Note 12 (Commitments, Contingencies and Guarantees) to the Consolidated Financial Statements.

Item 3. Legal Proceedings

Corning is a defendant in various lawsuits and is subject to various claims that arise in the normal course of business, the most significant of which are summarized in Note 12 (Commitments and Contingencies) to the Consolidated Financial Statements. In the opinion of management, the likelihood that the ultimate disposition of these matters will have a material adverse effect on Corning's consolidated financial position, liquidity, or results of operations, is remote.

Environmental Litigation. Corning has been named by the Environmental Protection Agency (the Agency) under the Superfund Act, or by state governments under similar state laws, as a potentially responsible party for 15 active hazardous waste sites. Under the Superfund Act, all parties who may have contributed any waste to a hazardous waste site, identified by the Agency, are jointly and severally liable for the cost of cleanup unless the Agency agrees otherwise. It is Corning's policy to accrue for its estimated liability related to Superfund sites and other environmental liabilities related to property owned by Corning based on expert analysis and continual monitoring by both internal and external consultants. At December 31, 2018 and December 31, 2017, Corning had accrued approximately $30 million (undiscounted) and $38 million (undiscounted), respectively, for the estimated liability for environmental cleanup and related litigation. Based upon the information developed to date, management believes that the accrued reserve is a reasonable estimate of the Company's liability and that the risk of an additional loss in an amount materially higher than that accrued is remote.

Item 4. Mine Safety Disclosure

None.

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PART II

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

(a) Corning Incorporated common stock is listed on the New York Stock Exchange. In addition, it is traded on the Boston, Midwest and Philadelphia stock exchanges. Common stock options are traded on the Chicago Board Options Exchange. The ticker symbol for Corning Incorporated is "GLW".

As of December 31, 2018, there were approximately 14,599 registered holders of common stock and approximately 468,550 beneficial shareholders.

Performance Graph

The following graph illustrates the cumulative total shareholder return over the last five years of Corning's common stock, the S&P 500 and the S&P Communications Equipment Companies. The graph includes the capital weighted performance results of those companies in the communications equipment company classification that are also included in the S&P 500.

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(b) Not applicable.

(c) The following table provides information about our purchases of our common stock during the fiscal fourth quarter of 2018:

Issuer Purchases of Equity Securities

Period	Number of shares purchased	Average price paid per share	Number of shares purchased as part of publicly announced plans or programs (1)	Approximate dollar value of shares that may yet be purchased under the plans or programs (1)
October 1-31, 2018	3,383,124	$ 31.95	3,338,983	
November 1-30, 2018	3,676,736	$ 32.10	3,658,311	
December 1-31, 2018	4,398,326	$ 30.64	4,378,063	
Total	11,458,186	$ 31.49	11,375,357	$ 1,348,213,211

(1) This column reflects the following transactions during the year ended December 31, 2018: (i) the deemed surrender to us of 31,702 shares of common stock to satisfy tax withholding obligations in connection with the vesting of employee restricted stock units; (ii) the surrender to us of 50,575 shares of common stock to satisfy tax withholding obligations in connection with the vesting of restricted stock issued to employees; (iii) the deemed surrender to us of 552 shares of common stock to pay the exercise price and to satisfy tax withholding obligations in connection with the exercise of employee stock options; and (iv) the purchase of 11,375,357 shares of common stock under the 2018 Repurchase Programs.

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Item 6. Selected Financial Data (Unaudited)

(In millions, except per share amounts and number of employees)

	Years ended December 31, 2018	2017	2016	2015	2014
Results of operations					
Net sales	$ 11,290	$ 10,116	$ 9,390	$ 9,111	$ 9,715
Research, development and engineering expenses	$ 993	$ 864	$ 736	$ 745	$ 811
Equity in earnings of affiliated companies	$ 390	$ 361	$ 284	$ 299	$ 266
Net income (loss) attributable to Corning Incorporated (1)(2)	$ 1,066	$ (497)	$ 3,695	$ 1,339	$ 2,472
Earnings (loss) per common share attributable to Corning Incorporated:					
Basic	$ 1.19	$ (0.66)	$ 3.53	$ 1.02	$ 1.82
Diluted	$ 1.13	$ (0.66)	$ 3.23	$ 1.00	$ 1.73
Cash dividends declared per common share	$ 0.72	$ 0.62	$ 0.54	$ 0.36	$ 0.52
Shares used in computing per share amounts:					
Basic earnings per common share	816	895	1,020	1,219	1,305
Diluted earnings per common share	941	895	1,144	1,343	1,427
Financial position					
Working capital	$ 3,723	$ 5,618	$ 6,297	$ 5,455	$ 7,914
Total assets	$ 27,505	$ 27,494	$ 27,899	$ 28,527	$ 30,041
Long-term debt	$ 5,994	$ 4,749	$ 3,646	$ 3,890	$ 3,205
Total Corning Incorporated shareholders' equity	$ 13,792	$ 15,698	$ 17,893	$ 18,788	$ 21,579
Selected data					
Capital expenditures	$ 2,242	$ 1,804	$ 1,130	$ 1,250	$ 1,076
Depreciation and amortization	$ 1,293	$ 1,158	$ 1,195	$ 1,184	$ 1,200
Number of employees	51,500	46,200	40,700	35,700	34,600

(1) Year ended December 31, 2017 includes the impact of the 2017 Tax Act, including a provisional toll charge ($1.1 billion) and provisional re-measurement of deferred tax balances due to the reduction in Corning's tax rate ($347 million).
(2) Year ended December 31, 2016 includes a $2.7 billion non-taxable gain on the strategic realignment of our ownership interest in Dow Corning.

Reference should be made to the Notes to the Consolidated Financial Statements and Management's Discussion and Analysis of Financial Condition and Results of Operations.

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

Organization of Information

Management's Discussion and Analysis provides a historical and prospective narrative on the Company's financial condition and results of operations. This discussion includes the following sections:

- Overview
- Results of Operations
- Core Performance Measures
- Reportable Segments
- Liquidity and Capital Resources
- Environment
- Critical Accounting Estimates
- New Accounting Standards
- Forward-Looking Statements

OVERVIEW

Strategy and Capital Allocation Framework

In October 2015, Corning announced a strategy and capital allocation framework (the "Framework") that reflects the Company's financial and operational strengths, as well as its ongoing commitment to increasing shareholder value. The Framework outlines our leadership priorities, and articulates the opportunities we see across our businesses. We designed the Framework to create significant value for shareholders by focusing our portfolio and leveraging our financial strength. Under the Framework we target generating $26 billion to $30 billion of cash through 2019, returning more than $12.5 billion to shareholders and investing $10 billion to extend our leadership positions and deliver growth.

Our probability of success increases as we invest in our world-class capabilities. Corning is concentrating approximately 80% of its research, development and engineering investment and capital spending on a cohesive set of three core technologies, four manufacturing and engineering platforms, and five market-access platforms. This strategy will allow us to quickly apply our talents and repurpose our assets as needed.

Performance against the Framework

Since introducing the Framework, we have distributed $11.8 billion to shareholders through share repurchases and dividends, and increased the annual dividend by 11.1% in 2019, 16.1% in 2018, 14.8% in 2017 and 12.5% in 2016 as part of our ongoing commitment to return cash to our investors.

Highlights of progress in Corning’s market-access platforms include:

· Securing contracts with industry leaders in the carrier and data center segments that will add significant sales in 2019 and beyond, and completing the acquisition of CMD in Optical Communications;
· Extending the company’s leadership in mobile consumer electronics with the launch and adoption of Gorilla Glass 6 as well as other cover glass and sensing technology innovations;
· Gaining significant new sales and platforms for gasoline particulate filters and strong pull for Gorilla Glass for Automotive solutions, particularly the industry’s first AutoGrade Glass Solutions for automotive interiors, reaching more than 55 platforms to date;
· Increasing our shipments of Valor Glass by four times year-over-year, indicating progress toward certification across more pharmaceutical companies in Life Sciences Vessels; and
· Reaching stable returns in Display Technologies as the glass pricing environment continued to improve and Corning extended global leadership by successfully ramping the world’s first Gen 10.5 LCD glass plant.

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2018 Results

Net sales in the year ended December 31, 2018 were $11.3 billion, an increase of $1.2 billion, or 12%, when compared to the year ended December 31, 2017, driven by sales increases across all segments.

For the year ended December 31, 2018, we generated net income of $1.1 billion, or $1.13 per share, compared to a net loss of $0.5 billion, or $(0.66) per share, for 2017. When compared to 2017, the $1.6 billion increase in net income was primarily due to the following items (amounts presented after tax):

- The absence of $1.5 billion in tax reform adjustments related to the 2017 Tax Act;
- Higher segment net income in our Optical Communications, Environmental Technologies, Specialty Materials and Life Sciences segments, up $123 million, $43 million, $12 million and $22 million, respectively; and
- The positive impact of $48 million in tax adjustments, primarily related to changes in the valuation allowances on deferred tax assets offset by the preliminary 2013-2014 IRS audit settlement.

Partially offsetting these events were the following items:

- An increase of $105 million in legal expenses, driven by a ruling in an intellectual property lawsuit and developments in civil litigation matters;
- An impact of $99 million resulting from an increase of mark-to-market loss for our defined benefit pension plans; and
- Lower segment net income in our Display Technologies and All Other segments in the amount of $53 million and $22 million, respectively.

Diluted earnings per share increased by $1.79 per share, or 271%, when compared to 2017, driven by the increase in net income described above, coupled with the repurchase of 74.8 million shares of common stock over the last twelve months.

The translation impact of fluctuations in foreign currency exchange rates, including the impact of hedges realized in 2018, did not materially impact Corning's consolidated net income in the year ended December 31, 2018 when compared to the year ended December 31, 2017.

2019 Corporate Outlook

We believe 2019 will be another year of strong growth and investment, consistent with our Strategy and Capital Allocation Framework. In our Display Technologies segment, we expect full year 2019 price declines to improve further to a mid-single digit percentage. We anticipate Corning's display glass volume will grow faster than the expected display glass market growth of mid-single digits, driven by television screen size growth and the ramp of our Gen 10.5 facility in China. In the Optical Communications segment, we expect sales to increase by low-teens in percentage terms, including the impact of a full year of sales from the acquisition of 3M's Communication Markets Division. We expect high-single digit sales growth in our Environmental Technologies segment. We expect growth in the Specialty Materials segment, the rate of which will depend on the adoption of our innovations. We anticipate low to mid-single digit percentage growth in sales for the Life Sciences segment.

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RESULTS OF OPERATIONS

Selected highlights from our operations follow (in millions):

	2018	2017	2016	% change 18 vs. 17	17 vs. 16
Net sales	$ 11,290	$ 10,116	$ 9,390	12	8
Gross margin	$ 4,461	$ 4,020	$ 3,763	11	7
(gross margin %)	40%	40%	40%		
Selling, general and administrative expenses	$ 1,799	$ 1,473	$ 1,462	22	1
(as a % of net sales)	16%	15%	16%		
Research, development and engineering expenses	$ 993	$ 864	$ 736	15	17
(as a % of net sales)	9%	9%	8%		
Equity in earnings of affiliated companies	$ 390	$ 361	$ 284	8	27
(as a % of net sales)	3%	4%	3%		
Translated earnings contract loss, net	$ (93)	$ (121)	$ (448)	23	73
(as a % of net sales)	(1)%	(1)%	(5)%		
Gain on realignment of equity investment			$ 2,676	*	*
(as a % of net sales)			28%		
Income before income taxes	$ 1,503	$ 1,657	$ 3,692	(9)	(55)
(as a % of net sales)	13%	16%	39%		
(Provision) benefit for income taxes	$ (437)	$ (2,154)	$ 3	80	*
(as a % of net sales)	(4)%	(21)%	*		
Net income (loss) attributable to Corning Incorporated	$ 1,066	$ (497)	$ 3,695	*	*
(as a % of net sales)	9%	(5)%	39%		

* Percent change not meaningful.

Segment Net Sales

The following table presents segment net sales by reportable segment (in millions):

	Years ended December 31,			% change	% change
	2018	2017	2016	18 vs. 17	17 vs. 16
Display Technologies	$ 3,276	$ 3,137	$ 3,288	4%	(5)%
Optical Communications	4,192	3,545	3,005	18%	18%
Specialty Materials	1,479	1,403	1,124	5%	25%
Environmental Technologies	1,289	1,106	1,032	17%	7%
Life Sciences	946	879	839	8%	5%
All Other	216	188	152	15%	24%
Total segment net sales	$ 11,398	$ 10,258	$ 9,440	11%	9%

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For the year ended December 31, 2018, segment net sales increased by $1.1 billion, or 11%, when compared to the same period in 2017. The primary sales drivers by segment were as follows:

- Display Technologies segment net sales increased $139 million compared to the prior year. Total display glass market volume was up in 2018. Our volume growth in this market more than offset price declines on a year-over-year basis. 2018 was the best pricing environment in more than a decade, achieving the important milestone of mid-single digit year-over-year declines during the second half of the year;
- An increase of $647 million in the Optical Communications segment, due to higher sales of carrier and enterprise network products, up $364 million and $283 million, respectively. The acquisition of CMD driving $200 million of the increase in sales;
- An increase of $76 million in the Specialty Materials segment driven by higher net sales of Gorilla Glass products, advanced optics and other specialty glass;
- An increase of $183 million in the Environmental Technologies segment, driven by sales growth in all categories including sales of gas particulate filters; and
- An increase of $67 million in the Life Sciences segment, as the business continued to outpace the market.

Movements in foreign exchange rates did not materially impact Corning's consolidated net sales in the year ended December 31, 2018, respectively, when compared to the same period in 2017.

For the year ended December 31, 2017, net sales increased by $818 million, or 9%, when compared to the same period in 2016. The primary sales drivers by segment were as follows:

- A decrease of $151 million in the Display Technologies segment, driven by price declines of approximately 10%, partially offset by an increase in volume in the mid-single digits in percentage terms;
- An increase of $540 million in the Optical Communications segment, due to higher sales of carrier and enterprise network products, up $446 million and $94 million, respectively, combined with the absence of production issues related to the implementation of new manufacturing software in the first quarter of 2016. Strong growth in the North American market drove the increase in carrier network products;
- An increase of $279 million in the Specialty Materials segment, driven by strong growth in segment net sales of Corning Gorilla Glass products, combined with an increase of $42 million in advanced optics products;
- An increase of $74 million in the Environmental Technologies segment, driven by higher net sales of automotive products, up $42 million, due to market strength in Europe, China and Asia, and initial commercial sales of gas particulate filters. Diesel product sales increased $32 million with higher demand for heavy-duty diesel products in North America and Asia;
- An increase of $40 million in the Life Sciences segment, driven by higher sales in North America and China; and
- An increase of $36 million in the All Other segment, driven by an increase in sales in our emerging businesses.

Movements in foreign exchange rates did not materially impact Corning's consolidated net sales in the year ended December 31, 2017, respectively, when compared to the same period in 2016.

In 2018, 2017 and 2016, sales in international markets accounted for 69%, 69% and 72%, respectively, of total net sales.

Cost of Sales

The types of expenses included in the cost of sales line item are: raw materials consumption, including direct and indirect materials; salaries, wages and benefits; depreciation and amortization; production utilities; production-related purchasing; warehousing (including receiving and inspection); repairs and maintenance; inter-location inventory transfer costs; production and warehousing facility property insurance; rent for production facilities; and other production overhead.

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Gross Margin

In the year ended December 31, 2018, gross margin dollars increased by $441 million, or 11%, and gross margin as a percentage of net sales was consistent when compared to the same period last year. The increase in gross margin dollars was primarily driven by the following items:

· Higher sales in the Optical Communications segment, driven by growth in Carrier and Enterprise products, resulting in increased gross margin of $291 million;
· An increase in Gorilla Glass and advanced optics product volume which contributed $48 million to gross margin; and
· Higher sales in the Environmental technologies segment drove an $85 million increase.

Gross margin increases were partially offset by higher costs related to capacity expansions across multiple business segments and display glass price declines.

Movements in foreign exchange rates did not materially impact Corning's consolidated gross margin in the year ended December 31, 2018, respectively, when compared to the same period in 2017.

In the year ended December 31, 2017, gross margin dollars increased by $257 million, or 7%, and gross margin as a percentage of net sales remained consistent at 40%, when compared to the same period last year. The increase in gross margin dollars was primarily driven by the following items:

· Higher volume in the Display Technologies segment, offset by higher costs related to capacity expansion;
· Higher volume in the Optical Communications segment, driven by growth in North America and Europe, partially offset by higher manufacturing expenses related to capacity expansion;
· An increase in Gorilla Glass and advanced optics product volume, slightly offset by higher raw materials costs; and
· Higher light-duty substrate demand in Europe, China and Asia, offset somewhat by lower North America demand, as well as an increase in demand for heavy-duty diesel products in North America and Asia. Partially offsetting the increase in demand was a decline in manufacturing efficiency due to the use of higher-cost manufacturing facilities and sales of lower margin products.

Display glass price declines of approximately 10% and the negative impact of movements in the Japanese yen and South Korean won in the amount of $73 million, which primarily impacted the Display Technologies segment, partially offset the increase.

Movements in foreign exchange rates did not materially impact Corning's consolidated net sales in the year ended December 31, 2017, respectively, when compared to the same period in 2016.

Selling, General and Administrative Expenses

When compared to the year ended December 31, 2017, selling, general and administrative expenses increased by $326 million, or 22%, in the year ended December 31, 2018. Selling, general and administrative expenses increased by 1% as a percentage of sales. The increase was primarily driven by the following items:

- An increase of $137 million in litigation and other legal expenses, driven by a ruling in an intellectual property lawsuit and developments in commercial litigation matters;
- An increase in the Optical Communications segment, up $65 million, largely driven by the acquisition of CMD;
- Increased corporate expenses of $55 million;
- Increased acquisition related costs of $25 million; and
- Increased costs in our emerging businesses, up $20 million, driven by investments in new customers and new business growth.

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When compared to the year ended December 31, 2016, selling, general and administrative expenses increased by $11 million in the year ended December 31, 2017. The increase was due to the following items:

- A decrease of $52 million in acquisition-related costs, driven by the absence of costs related to the realignment of our equity interests in Dow Corning completed in the second quarter of 2016, offset slightly by several small acquisitions occurring in 2017;
- A decrease of $64 million in litigation, regulatory and other legal costs, primarily driven by the absence of events occurring in the second quarter of 2016. In this period, we recorded litigation and other expenses related to the resolution of an investigation by the U.S. Department of Justice and an environmental matter in the amount of $98 million, offset somewhat by the gain on the contribution of our equity interests in PCC and PCE as partial settlement of the asbestos litigation in the amount of $56 million; and
- A decrease of $46 million in the mark-to-market of our defined benefit pension plans.

Offsetting these events were the following items:

- A decrease of $32 million in gains from the contingent consideration fair value adjustment;
- An increase of $51 million in the Optical Communications segment due to costs associated with acquisitions and growth initiatives; and
- An increase of $24 million in the Specialty Materials segment in support of new product launches.

The types of expenses included in the selling, general and administrative expenses line item are: salaries, wages and benefits; travel; professional fees; and depreciation and amortization, utilities, and rent for administrative facilities.

Research, Development and Engineering Expenses

For year ended December 31, 2018, research, development and engineering expenses increased by $129 million, or 15%, when compared to 2017, driven by higher costs associated with new product launches and our emerging businesses. As a percentage of sales, these expenses were flat when compared to the same period last year.

In the year ended December 31, 2017, research, development and engineering expenses increased by $128 million, or 17%, when compared to the same period last year, driven by the absence of the impact of a 2016 joint development agreement in the Display Technologies segment, as well as higher costs associated with new product launches in the Optical Communications, Specialty Materials and Environmental Technologies segments, up $20 million, $11 million and $7 million, respectively. As a percentage of sales, these expenses decreased one percent when compared to the same period last year.

Equity in Earnings of Affiliated Companies

The following provides a summary of equity earnings of affiliated companies (in millions):

	Years ended December 31,		
	2018	2017	2016
Dow Corning Corporation (1)			$ 82
Hemlock Semiconductor Group (2)	$ 388	$ 352	212
All other	2	9	(10)
Total equity earnings	$ 390	$ 361	$ 284

(1) Results include equity earnings for Dow Corning, which includes the silicones business and Hemlock Semiconductor business, through May 31, 2016, the date of the realignment of our ownership interest in Dow Corning.
(2) Results include equity earnings for HSG beginning on June 1, 2016.

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On May 31, 2016, Corning completed the strategic realignment of its equity investment in Dow Corning Corporation (“Dow Corning”) pursuant to the Transaction Agreement announced on December 10, 2015. Under the terms of the Transaction Agreement, Corning exchanged with Dow Corning its 50% stock interest in Dow Corning for 100% of the stock of a newly formed entity, which held an equity interest in Hemlock Semiconductor Group (HSG) and approximately $4.8 billion in cash.

The equity in earnings line on our income statement for the year ended December 31, 2016 reflects both the equity earnings from the silicones and polysilicones (HSG) businesses of Dow Corning from January 1, 2016 through May 31, 2016. Prior to the realignment of Dow Corning, equity earnings from the HSG business were reported on the equity in earnings line in Corning’s income statement, net of Dow Corning’s 35% U.S. tax. Additionally, Corning reported its tax on equity earnings from Dow Corning on the tax provision line on its income statement at a U.S. tax provision rate of 7%. As part of the realignment, HSG was converted to a partnership. Each of the partners is responsible for the taxes on their portion of equity earnings. Therefore, post-realignment, HSG’s equity earnings is reported before tax on the equity in earnings line and Corning’s tax is reported on the tax provision line.

Refer to Note 12 (Commitments, Contingencies and Guarantees) to the consolidated financial statements for additional information.

Translated earnings contracts

Included in the line item Translated earnings contract loss, net, is the impact of foreign currency hedges which hedge our translation exposure arising from movements in the Japanese yen, South Korean won, euro, Chinese yuan and British pound against the U.S. dollar and its impact on our net income (loss). The following table provides detailed information on the gains and losses associated with our translated earnings contracts:

	Year ended December 31, 2018		Year ended December 31, 2017		Change 2018 vs. 2017	
(in millions)	Income before income taxes	Net income	Income before income taxes	Net income	Income before income taxes	Net income
Hedges related to translated earnings:						
Realized gain, net	$ 97	$ 78	$ 270	$ 169	$ (173)	$ (91)
Unrealized loss	(190)	(189)	(391)	(247)	201	58

Total translated earnings contract loss, net	$ (93)	$ (111)	$ (121)	$ (78)	$ 28	$ (33)

	Year ended December 31, 2017		Year ended December 31, 2016		Change 2017 vs. 2016	
(in millions)	Income before income taxes	Net income	Income before income taxes	Net income	Income before income taxes	Net income
Hedges related to translated earnings:						
Realized gain, net	$ 270	$ 169	$ 201	$ 127	$ 69	$ 42
Unrealized loss	(391)	(247)	(649)	(409)	258	162
Total translated earnings contract loss, net	$ (121)	$ (78)	$ (448)	$ (282)	$ 327	$ 204

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The gross notional value outstanding for our translated earnings contracts at December 31, 2018, 2017 and 2016 were as follows (in billions):

	Years ended December 31,		
	2018	2017	2016
Japanese yen-denominated hedges	$ 11.6	$ 13.0	$ 14.9
South Korean won-denominated hedges	0.1	0.8	1.2
Euro-denominated hedges	1.2	0.3	0.3
Chinese yuan-denominated hedges	0.6	0.2	0.3
British pound-denominated hedges	0.1		
Total gross notional value outstanding	$ 13.6	$ 14.3	$ 16.7

Income Before Income Taxes

The translation impact of fluctuations in foreign currency exchange rates, including the impact of hedges realized in 2018, did not impact Corning's income before income taxes in the years ended December 31, 2018 and 2017, respectively, when compared to the same period in the prior year.

(Provision) Benefit for Income Taxes

Our (provision) benefit for income taxes and the related effective income tax rates were as follows (dollars in millions):

	Years ended December 31,		
	2018	2017	2016
(Provision) benefit for income taxes	$ (437)	$ (2,154)	$ 3
Effective tax rate (benefit)	29.1%	130.0%	(0.1)%

For the year ended December 31, 2018, the effective income tax rate differed from the U.S. statutory rate of 21% primarily due to the following:

- Additional taxes of $55 million related primarily to the global intangible low-taxed income (“GILTI”) provisions of the 2017 Tax Act; and
- Incremental tax expense of $172 million related to a preliminary agreement with the IRS for the income tax audit of years 2013 and 2014.

These items were partially offset by the following:

- A benefit of $35 million related to the finalization of the one-time toll charge recorded in 2017; and
- An $82 million benefit from the release of a valuation allowance on deferred tax assets that are now considered realizable.

For the year ended December 31, 2017, the effective income tax rate differed from the U.S. statutory rate of 35% primarily due to the following:

- As a result of the 2017 Tax Act, a provisional tax expense of $1.1 billion for the one-time toll charge on unrepatriated earnings of certain foreign subsidiaries that were previously deferred;
- The result of a provisional tax expense of $347 million recorded for the U.S. deferred tax assets and liabilities re-measured at the reduced rate of 21%; and
- Rate differences on income (loss) of consolidated foreign companies.

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The effective income tax rate for 2016 differed from the U.S. statutory rate of 35% primarily due to the following items:

- Rate differences on income (loss) of consolidated foreign companies, including the benefit of excess foreign tax credits resulting from the inclusion of foreign earnings in U.S. income; and
- The tax-free nature of the realignment of our equity interest in Dow Corning during the period, as well as the release of the deferred tax liability related to Corning's tax on Dow Corning's undistributed earnings as of the date of the transaction.

In December 2017, the U.S. enacted the 2017 Tax Act which resulted in significant changes for our financial results, including, but not limited to, (1) reducing the U.S. federal corporate income tax rate to 21%, and (2) imposing a one-time toll charge tax on certain unrepatriated earnings of foreign subsidiaries of U.S. companies that had not been previously taxed in the U.S.

Given the significant complexity of the 2017 Tax Act and the lack of clear tax and accounting regulatory guidance for this new law, the Securities Exchange Commission issued its Staff Accounting Bulletin 118 ("SAB 118") to provide registrants additional time to analyze and report the effects of tax reform during the "measurement period". Under SAB 118, the registrant was required to record those items where ASC 740 analysis was complete; include reasonable estimates and label them as provisional where ASC 740 analysis was incomplete; and if reasonable estimates could not be made, record items under the previous tax law. The measurement period, not to exceed one year, ended on the date the entity had obtained, prepared, and analyzed the information that was needed to complete the accounting requirements under ASC Topic 740.

The 2017 Tax Act also established new tax provisions affecting our 2018 results, including, but not limited to: (1) Creating a new provision to tax global intangible low-taxed income (GILTI); (2) generally eliminating U.S. federal taxes on dividends from foreign subsidiaries; (3) eliminating the corporate alternative minimum tax ("AMT"); (4) creating the base erosion anti-abuse tax ("BEAT"); (5) establishing a deduction for foreign derived intangible income ("FDII"); (6) establishing new limitations on deductible interest expense; and (7) establishing new limitations on the deductibility of certain executive compensation.

For the year ended December 31, 2018, Corning's results included a worldwide tax provision of $437 million, inclusive of tax on ongoing operations of $412 million and the impacts of the 2017 Tax Act of $25 million. The impacts of the 2017 Tax Act include: GILTI tax of $55 million, FDII benefit of $10 million, and a $20 million benefit related to truing up the toll charge and our measurement of U.S. deferred taxes, offset by the recording of a provision related to lifting our assertion of indefinite reinvestment on certain foreign earnings. As of December 31, 2018, Corning has completed its analysis of the impact of the 2017 Tax Act as required by SAB 118. The GILTI tax of $55 million was largely driven by the receipt of customer deposits. See Note 2 (Revenue) to these Consolidated Financial Statements for more information.

Corning has completed its analysis on the impact of the 2017 Tax Act on its assertion regarding its indefinitely reinvested foreign earnings. Corning has determined that it will no longer assert indefinite asset reinvestment on $15.4 billion of unremitted foreign earnings accumulated prior to 2018. This represents approximately 94% of Corning's unremitted foreign earnings as of the end of 2017. Corning will continue to indefinitely reinvest the remaining 6% of historic foreign earnings as of December 31, 2017.

Beginning in 2018, Corning will indefinitely reinvest the foreign earnings of: (1) any of its subsidiaries located in jurisdictions where Corning lacks the ability to repatriate its earnings, (2) any of its subsidiaries where Corning's intention is to reinvest those earnings in operations, (3) legal entities for which Corning holds a non-controlling interest, (4) any subsidiaries with an accumulated deficit in earnings and profits and (5) any subsidiaries which have a positive earnings and profits balance but for which the entity lacks sufficient local statutory earnings or stock basis from which to make a distribution.

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During 2018, the Company distributed approximately $4.2 billion from foreign subsidiaries to their respective U.S. parent companies. There are no incremental taxes beyond the toll charge due with respect to these distributions. As of December 31, 2018, Corning has approximately $1.5 billion of indefinitely reinvested foreign earnings. It remains impracticable to calculate the tax cost of repatriating our unremitted earnings which are considered indefinitely reinvested.

Refer to Note 4 (Income Taxes) to the Consolidated Financial Statements for further details regarding income tax matters.

Net Income (Loss) Attributable to Corning Incorporated

As a result of the items discussed above, net income (loss) and per share data was as follows (in millions, except per share amounts):

	Years ended December 31,		
	2018	2017	2016
Net income (loss) attributable to Corning Incorporated	$ 1,066	$ (497)	$ 3,695
Net income (loss) attributable to Corning Incorporated used in basic earnings per common share calculation (1)	$ 968	$ (595)	$ 3,597
Net income (loss) attributable to Corning Incorporated used in diluted earnings per common share calculation (1)	$ 1,066	$ (595)	$ 3,695
Basic earnings (loss) per common share	$ 1.19	$ (0.66)	$ 3.53
Diluted earnings (loss) per common share	$ 1.13	$ (0.66)	$ 3.23
Weighted-average common shares outstanding - basic	816	895	1,020
Weighted-average common shares outstanding - diluted	941	895	1,144

(1) Refer to Note 16 (Earnings per Common Share) to the Consolidated Financial Statements for additional information.

Comprehensive Income

(In millions)	Years ended December 31, 2018	2017	2016
Net income (loss) attributable to Corning Incorporated	$ 1,066	$ (497)	$ 3,695
Foreign currency translation adjustments and other	(185)	746	(104)
Net unrealized (loss) gain on investments	(1)	14	(3)
Unamortized gains (losses) and prior service credits (costs) for postretirement benefit plans	19	30	241
Net unrealized (loss) gain on designated hedges	(1)	44	1
Other comprehensive (loss) income, net of tax	(168)	834	135
Comprehensive income attributable to Corning Incorporated	$ 898	$ 337	$ 3,830

2018 vs. 2017

For the year ended December 31, 2018, comprehensive income increased by $0.6 billion, when compared to the same period in 2017, driven by an increase in net income of $1.6 billion largely driven by the absence of $1.5 billion in tax reform adjustments related to the 2017 Tax Act.

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Partially offsetting this increase was a decrease in the gain on foreign currency translation adjustments in the amount of $0.9 billion (after-tax), largely driven by the strengthening of foreign currencies, most significantly the South Korean won, euro and the Chinese yuan, which impacted comprehensive income in the amounts of $556 million, $156 million and $114 million, respectively.

2017 vs. 2016

For the year ended December 31, 2017, comprehensive income decreased by $3.5 billion, when compared to the same period in 2016, driven by a decrease in net income of $4.2 billion and a decrease in unamortized actuarial gains for postretirement benefit plans. The significant decrease in net income was largely driven by the absence of a $2.7 billion non-taxable gain and a $105 million positive tax adjustment on the strategic realignment of our ownership interest in Dow Corning recorded in the second quarter of 2016, combined with the impact of the passage of the 2017 Tax Act, which included a provisional toll charge of $1.1 billion and a provisional charge of $347 million as a result of the remeasurement of U.S. deferred tax assets and liabilities. Our unamortized actuarial gains decreased driven by a decrease in the discount rates used to value our postretirement benefit obligations.

Partially offsetting these decreases was an increase in the gain on foreign currency translation adjustments in the amount of $850 million (after-tax), largely driven by the weakening of foreign currencies, most significantly the South Korean won, Japanese yen and the euro, which impacted comprehensive income in the amounts of $420 million, $164 million and $115 million, respectively.

See Note 11 (Employee Retirement Plans) and Note 15 (Shareholders’ Equity) to the Consolidated Financial Statements for additional details.

CORE PERFORMANCE MEASURES

In managing the Company and assessing our financial performance, we adjust certain measures provided by our consolidated financial statements to exclude specific items to arrive at core performance measures. These items include gains and losses on our translated earnings contracts, acquisition-related costs, certain discrete tax items, restructuring and restructuring-related charges, certain litigation-related expenses, pension mark-to-market adjustments and other items which do not reflect on-going operating results of the Company or our equity affiliates. Additionally, Corning has adopted the use of constant currency reporting for our Display Technologies and Specialty Materials segments for the Japanese yen, South Korean won, Chinese yuan and New Taiwan dollar currencies. The Company believes that the use of constant currency reporting allows investors to understand our results without the volatility of currency fluctuations, and reflects the underlying economics of the translated earnings contracts used to mitigate the impact of changes in currency exchange rates on our earnings and cash flows. Corning also believes that reporting core performance measures provides investors greater transparency to the information used by our management team to make financial and operational decisions.

Core performance measures are not prepared in accordance with Generally Accepted Accounting Principles in the United States ("GAAP"). We believe investors should consider these non-GAAP measures in evaluating our results as they are more indicative of our core operating performance and how management evaluates our operational results and trends. These measures are not, and should not be viewed as a substitute for, GAAP reporting measures. With respect to the Company's outlook for future periods, it is not possible to provide reconciliations for these non-GAAP measures because the Company does not forecast the movement of the Japanese yen, South Korean won, Chinese yuan or New Taiwan dollar against the U.S. dollar, or other items that do not reflect ongoing operations, nor does it forecast items that have not yet occurred or are out of the Company's control. As a result, the Company is unable to provide outlook information on a GAAP basis.

For a reconciliation of non-GAAP performance measures to their most directly comparable GAAP financial measure, please see "Reconciliation of Non-GAAP Measures" below.

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RESULTS OF OPERATIONS – CORE PERFORMANCE MEASURES

Selected highlights from our continuing operations, excluding certain items, follow (in millions):

	Years ended December 31,			% change	
	2018	2017	2016	18 vs. 17	17 vs. 16
Core net sales	$ 11,398	$ 10,258	$ 9,440	11%	9%
Core equity in earnings of affiliated companies	$ 241	$ 211	$ 249	14%	(15)%
Core earnings	$ 1,673	$ 1,634	$ 1,651	2%	(1)%

Core Net Sales

Core net sales are consistent with net sales by reportable segment. The following table presents segment net sales by reportable segment (in millions):

	Years ended December 31,			% change	
	2018	2017	2016	18 vs. 17	17 vs. 16
Display Technologies	$ 3,276	$ 3,137	$ 3,288	4%	(5)%
Optical Communications	4,192	3,545	3,005	18%	18%
Specialty Materials	1,479	1,403	1,124	5%	25%
Environmental Technologies	1,289	1,106	1,032	17%	7%
Life Sciences	946	879	839	8%	5%
All Other	216	188	152	15%	24%
Total segment net sales (1)	$ 11,398	$ 10,258	$ 9,440	11%	9%

(1) Segment net sales and variances are discussed in detail in the Reportable Segments section of our MD&A.

Core Equity in Earnings of Affiliated Companies

The following provides a summary of core equity in earnings of affiliated companies (in millions):

	Years ended December 31,			% change	
	2018	2017	2016	18 vs. 17	17 vs. 16
Dow Corning Corporation (1)			$ 98		(100)%
Hemlock Semiconductor Group (2)	$ 236	$ 201	154	17%	31%
All other	5	10	(3)	(50)%	433%
Total core equity earnings	$ 241	$ 211	$ 249	14%	(15)%

(1) Results include equity earnings for Dow Corning, which includes the silicones business and Hemlock Semiconductor business, through May 31, 2016, the date of the realignment of our ownership interest in Dow Corning.
(2) Results include equity earnings for HSG beginning on June 1, 2016.

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Core Earnings

2018 vs. 2017

In the year ended December 31, 2018, we generated core earnings of $1,673 million or $1.78 per share, compared to core earnings generated in the year ended December 31, 2017 of $1,634 million, or $1.60 per share. The increase in core earnings of $39 million was driven by the following items:

· An increase in the Optical Communications segment of $123 million, driven by higher sales of carrier and enterprise network products;
· An increase in the Environmental Technologies segment of $43 million resulting from sales growth across all product lines;
· An increase of $22 million in the Life Sciences segment resulting from higher sales, as well as improved manufacturing efficiencies; and
· An increase of $12 million in the Specialty Materials segment driven by higher sales of Gorilla Glass, advanced optics and other specialty glass.

Partially offsetting these increases in earnings were the following:

· A decrease in the Display Technologies segment of $53 million, with the costs of expanding Gen 10.5 capacity, ramping production and rebuilding tanks for fleet optimization during the first half of the year more than offsetting increased sales;
· A decrease of $22 million in the All Other segment resulting from increased investment in development projects;
· Increased financing expenses of $30 million; and
· Increased corporate project expenses $39 million.

Core earnings per share increased in the year ended December 31, 2018 to $1.78 per share, driven by the increase in core income and lower weighted average shares outstanding due to repurchases of our common stock during 2018.

2017 vs. 2016

In the year ended December 31, 2017, we generated core earnings of $1,634 million or $1.60 per share, compared to core earnings generated in the year ended December 31, 2016 of $1,651million, or $1.44 per share. The decrease in core earnings of $17 million was driven by the following items:

- The absence of equity earnings of $98 million from Dow Corning's silicones business due to our 2016 realignment of our ownership interest in Dow Corning;
- A decrease of $65 million in the Display Technologies segment, driven by display glass price declines of approximately 10%, partially offset by an increase in volume in the mid-single digits in percentage terms; and
- An increase in corporate project expenses and variable compensation of $29 million and $25 million, respectively.

The decline was offset by an increase in core earnings in the Optical Communications segment of $118 million, due to higher sales of carrier and enterprise network products, combined with the absence of the production issues in the first half of 2016 related to the implementation of new software and an increase in the Specialty Materials segment of $73 million, driven by an increase in Corning Gorilla Glass and advanced optics products.

Although core net earnings decreased in the year ended December 31, 2017, core earnings per share increased $0.16 per share, driven by lower weighted average shares outstanding due to repurchases of our common stock in 2017.

Included in core earnings for the years ended December 31, 2018, 2017 and 2016 is net periodic pension expense in the amount of $52 million, $49 million and $51 million, respectively, which excludes the annual pension mark-to-market adjustments. In the years ended December 31, 2018, 2017 and 2016, the mark-to-market adjustments pre-tax losses of $145 million, $21 million and $67 million, respectively.

Refer to Note 11 (Employee Retirement Plans) to the Consolidated Financial Statements for additional information.

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Core Earnings per Common Share

The following table sets forth the computation of core basic and core diluted earnings per common share (in millions, except per share amounts):

	2018	2017	2016
Core earnings attributable to Corning Incorporated	$ 1,673	$ 1,634	$ 1,651
Less: Series A convertible preferred stock dividend	98	98	98
Core earnings available to common stockholders - basic	1,575	1,536	1,553
Add: Series A convertible preferred stock dividend	98	98	98
Core earnings available to common stockholders - diluted	$ 1,673	$ 1,634	$ 1,651
Weighted-average common shares outstanding - basic	816	895	1,020
Effect of dilutive securities:			
Stock options and other dilutive securities	10	11	9
Series A convertible preferred stock	115	115	115
Weighted-average common shares outstanding - diluted	941	1,021	1,144
Core basic earnings per common share	$ 1.93	$ 1.72	$ 1.52
Core diluted earnings per common share	$ 1.78	$ 1.60	$ 1.44

Reconciliation of Non-GAAP Measures

We utilize certain financial measures and key performance indicators that are not calculated in accordance with GAAP to assess our financial and operating performance. A non-GAAP financial measure is defined as a numerical measure of a company's financial performance that (i) excludes amounts, or is subject to adjustments that have the effect of excluding amounts, that are included in the comparable measure calculated and presented in accordance with GAAP in the statement of income or statement of cash flows, or (ii) includes amounts, or is subject to adjustments that have the effect of including amounts, that are excluded from the comparable measure as calculated and presented in accordance with GAAP in the statement of income or statement of cash flows.

Core net sales, core equity in earnings of affiliated companies and core earnings are non-GAAP financial measures utilized by our management to analyze financial performance without the impact of items that are driven by general economic conditions and events that do not reflect the underlying fundamentals and trends in the Company's operations.

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The following tables reconcile our non-GAAP financial measures to their most directly comparable GAAP financial measure (amounts in millions except percentages and per share amounts):

	Year ended December 31, 2018					
	Net Sales	Equity earnings	Income before income taxes	Net income	Effective tax rate (a)	Earnings per share
As reported	$ 11,290	$ 390	$ 1,503	$ 1,066	29.1%	$ 1.13
Constant-currency adjustment (1)	108	2	156	127		0.13
Translation loss on Japanese yen-denominated debt (2)			18	15		0.02
Translated earnings contract loss, net (3)			73	97		0.10
Acquisition-related costs (4)			132	103		0.11
Discrete tax items and other tax-related adjustments (5)				79		0.08
Litigation, regulatory and other legal matters (6)			124	96		0.10
Restructuring, impairment and other charges (7)			130	96		0.10
Equity in earnings of affiliated companies (8)		(151)	(151)	(119)		(0.13)
Pension mark-to-market adjustment (10)			145	113		0.12
Core performance measures	$ 11,398	$ 241	$ 2,130	$ 1,673	21.5%	$ 1.78

(a)Based upon statutory tax rates in the specific jurisdiction for each event.

See “Items Excluded from GAAP Measures” below for the descriptions of the footnoted reconciling items.

	Year ended December 31, 2017					
	Net sales	Equity earnings	Income before income taxes	Net (loss) income	Effective tax rate (a)	(Loss) earnings per share
As reported	$ 10,116	$ 361	$ 1,657	$ (497)	130.0%	$ (0.66)
Constant-currency adjustment (1)	142	2	168	138		0.15
			(14)	(9)		(0.01)

Translation gain on Japanese yen-denominated debt (2)						
Translated earnings contract loss, net (3)			125	78		0.09
Acquisition-related costs (4)			84	59		0.07
Discrete tax items and other tax-related adjustments (5)				127		0.14
Litigation, regulatory and other legal matters (6)			(12)	(9)		(0.01)
Restructuring, impairment and other charges (7)			72	62		0.07
Equity in earnings of affiliated companies (8)		(152)	(152)	(97)		(0.11)
Adjustments related to acquisitions (9)			10	13		0.01
Pension mark-to-market adjustment (10)			22	14		0.02
Adjustments resulting from the 2017 Tax Act (13)				1,755		1.96
Core performance measures	$ 10,258	$ 211	$ 1,960	$ 1,634	16.6%	$ 1.60

(a)Based upon statutory tax rates in the specific jurisdiction for each event.

See “Items Excluded from GAAP Measures” below for the descriptions of the footnoted reconciling items.

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	Year ended December 31, 2016					
	Net sales	Equity earnings	Income before income taxes	Net income	Effective tax rate (a)	Earnings per share
As reported	$ 9,390	$ 284	$ 3,692	$ 3,695	0%	$ 3.23
Constant-currency adjustment (1)	50	1	85	65		0.06
Translated earnings contract loss, net (3)			448	282		0.25
Acquisition-related costs (4)			127	107		0.09
Discrete tax items and other tax-related adjustments (5)				(27)		(0.02)
Litigation, regulatory and other legal matters (6)			55	70		0.06
Restructuring, impairment and other charges (7)			199	138		0.12
Equity in earnings of affiliated companies (8)		(37)	(37)	(18)		(0.02)
Adjustments related to acquisitions (9)			(49)	(42)		(0.04)
Pension mark-to-market adjustment (10)			67	44		0.04
Gain on realignment of equity investment (11)			(2,676)	(2,676)		(2.34)
Taiwan power outage (12)			17	13		0.01
Core performance measures	$ 9,440	$ 248	$ 1,928	$ 1,651	14.4%	$ 1.44

(a)Based upon statutory tax rates in the specific jurisdiction for each event.

See “Items Excluded from GAAP Measures” below for the descriptions of the footnoted reconciling items.

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Items which we exclude from GAAP measures to arrive at core performance measures are as follows:

(1) Constant-currency adjustments: Because a significant portion of Display Technologies segment revenues are denominated in Japanese yen, and a significant portion of Display Technologies and Specialty Materials segment manufacturing costs are denominated in Japanese Yen, Korean won, New Taiwan dollar and Chinese yuan, management believes it is important to understand the impact on earnings of translating these currencies into U.S. dollars. Presenting results on a constant-currency basis mitigates the translation impact and allows management to evaluate performance period over period, analyze underlying trends in our businesses, and establish operational goals and forecasts.
Constant-yen: As of January 1, 2018, we use an internally derived management rate of ¥107, which is closely aligned to our current yen portfolio of foreign currency hedges, and have recast all periods presented based on this rate to effectively remove the impact of changes in the Japanese yen.
Constant-won: As of January 1, 2018, we use an internally derived management rate of 1,175, which is closely aligned to our current won portfolio of foreign currency hedges, and have recast all periods presented based on this rate.
Constant-yuan: In January 2018, we began presenting results of the Display Technologies and Specialty Materials segments on a constant-yuan basis to mitigate the translation impact of this currency on these segments. We use an internally derived management rate of yuan 6.7, which is closely aligned to our current yuan portfolio of foreign currency hedges and consistent with historical prior period averages.
Constant-Taiwan dollar: In January 2018, we began presenting results of the Display Technologies and Specialty Materials segments on a constant-Taiwan dollar basis to mitigate the translation impact of this currency on these segments. We use an internally derived management rate of New Taiwan dollar 31, which is closely aligned to our current New Taiwan dollar portfolio of cash flow hedges, and approximates the 10-year historical average of the currency.

(2) Translation (gain) loss on Japanese yen-denominated debt: We have excluded the gain or loss on the translation of our yen-denominated debt to U.S. dollars.

(3) Translated earnings contract (gain) loss: We have excluded the impact of the realized and unrealized gains and losses of our Japanese yen, South Korean won, Chinese yuan and New Taiwan dollar-denominated foreign currency hedges related to translated earnings, as well as the unrealized gains and losses of our euro and British pound-denominated foreign currency hedges related to translated earnings.

(4) Acquisition-related costs: These expenses include intangible amortization, inventory valuation adjustments and external acquisition-related deal costs.

(5) Discrete tax items and other tax-related adjustments: For 2018, this amount primarily relates to the preliminary IRS audit settlement offset by changes in judgment about the realizability of certain deferred tax assets. For 2017, this amount represents the removal of discrete adjustments (e.g., changes in tax law, other than those of the 2017 Tax Act which are set forth separately, and changes in judgment about the realizability of certain deferred tax assets) as well as other non-operational tax-related adjustments.

(6) Litigation, regulatory and other legal matters: Includes amounts that reflect developments in commercial litigation, intellectual property disputes and other legal matters.

(7) Restructuring, impairment and other charges: This amount includes restructuring, impairment and other charges, as well as other expenses which are not related to continuing operations and are not classified as restructuring expense.

(8)

Equity in earnings of affiliated companies: These adjustments relate to costs not related to continuing operations of our affiliated companies, such as restructuring, impairment and other charges and settlements, or modifications, under "take-or-pay" contracts.

(9) Adjustments related to acquisitions: Includes fair value adjustments to the Corning Precision Materials indemnity asset related to contingent consideration, post-combination expenses and other acquisition and disposal adjustments.

(10) Pension mark-to-market adjustment: Defined benefit pension mark-to-market gains and losses, which arise from changes in actuarial assumptions and the difference between actual and expected returns on plan assets and discount rates.

(11) Gain on realignment of equity investment: Gain recorded upon the completion of the strategic realignment of our ownership interest in Dow Corning.

(12) Taiwan power outage: Impact of the power outage that temporarily halted production at our Tainan, Taiwan manufacturing location in the second quarter of 2016. The impact includes asset write-offs and charges for facility repairs, offset somewhat by partial reimbursement through our insurance program.

(13) Adjustments resulting from the 2017 Tax Act: Includes a provisional amount related to the one-time mandatory tax on unrepatriated foreign earnings, a provisional amount related to the remeasurement of U.S. deferred tax assets and liabilities, changes in valuation allowances as a result of the 2017 Tax Act, and adjustments for the elimination of excess foreign tax credit planning.

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REPORTABLE SEGMENTS

Our reportable segments are as follows:

- Display Technologies – manufactures glass substrates primarily for flat panel liquid crystal displays.
- Optical Communications – manufactures carrier and enterprise network components for the telecommunications industry.
- Environmental Technologies – manufactures ceramic substrates and filters for automotive and diesel emission control applications.
- Specialty Materials – manufactures products that provide more than 150 material formulations for glass, glass ceramics and fluoride crystals to meet demand for unique customer needs.
- Life Sciences – manufactures glass and plastic labware, equipment, media and reagents enabling workflow solutions for scientific applications.

All other segments that do not meet the quantitative threshold for separate reporting have been grouped as “All Other.” This group is primarily comprised of the results of pharmaceutical technologies, auto glass, new product lines and development projects, as well as certain corporate investments such as Eurokera and Keraglass equity affiliates.

We prepared the financial results for our reportable segments on a basis that is consistent with the manner in which we internally disaggregate financial information to assist in making internal operating decisions. We included the earnings of equity affiliates that are closely associated with our reportable segments in the respective segment’s net income. We have allocated certain common expenses among our reportable segments differently than we would for stand-alone financial information prepared in accordance with GAAP. Our reportable segments include non-GAAP measures which are not prepared in accordance with GAAP. We believe investors should consider these non-GAAP measures in evaluating our results as they are more indicative of our core operating performance and how management evaluates our operational results and trends. These measures are not, and should not be viewed as a substitute for GAAP reporting measures. For a reconciliation of non-GAAP performance measures to their most directly comparable GAAP financial measure, please see “Reconciliation of Non-GAAP Measures” above. Segment net income may not be consistent with measures used by other companies. The accounting policies of our reportable segments are the same as those applied in the consolidated financial statements.

Display Technologies

The following table provides net sales and net income for the Display Technologies segment:

	Years ended December 31,			% change	% change
	2018	2017	2016	18 vs. 17	17 vs. 16
Segment net sales	$ 3,276	$ 3,137	$ 3,288	4%	(5%)
Segment net income	$ 835	$ 888	$ 953	(6%)	(7%)

2018 vs. 2017

Display Technologies segment net sales increased $139 million compared to the prior year. Total display glass market volume was up in 2018. Our volume growth in this market more than offset price declines on a year-over-year basis. 2018 was the best pricing environment in more than a decade, achieving the important milestone of mid-single digit year-over-year declines during the second half of the year.

Net income decreased by $53 million, or 6%, mainly driven by the costs of expanding Gen 10.5 capacity, ramping production and rebuilding tanks for fleet optimization during the first half of the year.

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2017 vs. 2016

Net sales decreased by $151 million, or 5%, in the year ended December 31, 2017, when compared to the same period in 2016, driven by price declines of approximately 10%, partially offset by an increase in volume in the mid-single digits in percentage terms.

Net income decreased by $65 million, or 7%, driven by the following items:

- The impact of price declines of approximately 10%; and
- An increase of $40 million in research, development and engineering expenses, primarily driven by the absence of the impact of a 2016 joint development agreement.

The decrease in net income was partially offset by the following items:

- A mid-single digit percentage increase in volume; and
- Improvements in manufacturing efficiency, which added $68 million.

Outlook:

For full-year 2019, Corning expects the display glass market to grow by a mid-single digit percentage, consistent with 2018. The Company expects Corning's volume to grow faster than the market due to expansion of our Gen 10.5 manufacturing capacity in China. 2018 was the best pricing environment in more than a decade achieving the important milestone of mid-single digit year-over-year declines in the second half of the year. We expect our full year 2019 price declines to improve further to a mid-single digit percentage and to be even better than they were in 2018.

Optical Communications

The following table provides net sales and net income for the Optical Communications segment:

Years ended December 31,			% change	% change
2018	2017	2016	18 vs. 17	17 vs. 16

Segment net sales	$ 4,192	$ 3,545	$ 3,005	18%	18%
Segment net income	$ 592	$ 469	$ 351	26%	34%

2018 vs. 2017

Net sales increased by $647 million, or 18%, in the year ended December 31, 2018, when compared to the same period in 2017, due to higher sales of carrier and enterprise network products. The acquisition of CMD drove $200 million of increased sales.

Net income in the year ended December 31, 2018 increased by $123 million, or 26%, driven by the increase in sales described above, partially offset by capacity expansion spending.

Movements in foreign currency exchange rates did not materially impact net sales or net income in this segment in the year ended December 31, 2018 when compared to the same period in 2017.

2017 vs. 2016

Net sales increased by $540 million, or 18%, in the year ended December 31, 2017, when compared to the same period in 2016, due to higher sales of carrier and enterprise network products, combined with the absence of production issues related to the implementation of new manufacturing software in the first half of 2016 and the impact of several small acquisitions completed in the 2017. Strong growth in the North American fiber-to-the-home market drove the increase in carrier network products.

Net income in the year ended December 31, 2017 increased by $118 million, or 34%, driven by the increase in sales described above, partially offset by capacity expansion spending.

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Movements in foreign currency exchange rates did not materially impact net sales or net income in this segment in the year ended December 31, 2017 when compared to the same period in 2016.

Outlook:

Full-year 2019 Optical Communications sales are expected to increase by a low-teens percentage on a year-over-year basis, including the impact of a full year of sales from the acquisition of CMD.

Specialty Materials

The following table provides net sales and net income for the Specialty Materials segment:

	Years ended December 31,			% change	% change
	2018	2017	2016	18 vs. 17	17 vs. 16
Segment net sales	$ 1,479	$ 1,403	$ 1,124	5%	25%
Segment net income	$ 313	$ 301	$ 228	4%	32%

2018 vs. 2017

Net sales in the Specialty Materials segment increased by $76 million, or 5%, in the year ended December 31, 2018, when compared to the same period in 2017, driven by an increase in sales of Gorilla Glass products, combined with an increase in sales of advanced optics products.

Net income in year ended December 31, 2018 increased by $12 million, or 4%, when compared to the same period in 2017, primarily due to the increase in net sales outlined above.

Movements in foreign currency exchange rates did not materially impact net sales or net income in this segment in the year ended December 31, 2018 when compared to the same period in 2017.

2017 vs. 2016

Net sales in the Specialty Materials segment increased by $279 million, or 25%, in the year ended December 31, 2017, when compared to the same period in 2016, driven by an increase in sales of Gorilla Glass products in support of new product launches, combined with an increase in advanced optics products.

Net income in year ended December 31, 2017 increased by $73 million, or 32%, when compared to the same period in 2016, primarily due to the increase in net sales.

Movements in foreign currency exchange rates did not materially impact net sales or net income in this segment in the year ended December 31, 2017 when compared to the same period in 2016.

Outlook:

The company expects year-over-year sales growth for Specialty Materials in 2019, with the rate dependent upon customer adoptions of our innovations.

Environmental Technologies

The following table provides net sales and net income for the Environmental Technologies segment:

	Years ended December 31,			% change	% change
	2018	2017	2016	18 vs. 17	17 vs. 16
Segment net sales	$ 1,289	$ 1,106	$ 1,032	17%	7%
Segment net income	$ 208	$ 165	$ 159	26%	4%

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2018 vs. 2017

Net sales increased $183 million, or 17% in the year ended December 31, 2018 driven by growth in all product categories, including more than $50 million in sales of gasoline particulate filters.

Net income in the year ended December 31, 2018 increased by $43 million, or 26%, driven by the reasons outlined above and improved manufacturing efficiencies.

Movements in foreign currency exchange rates did not materially impact net sales or net income in this segment for the year ended December 31, 2018 when compared to the same period in 2017.

2017 vs. 2016

Net sales increased $74 million, or 7% in the year ended December 31, 2017. Automotive product sales increased by $42 million, due to market strength in Europe, China and Asia, and initial commercial sales of gas particulate filters. Diesel product sales increased $32 million with higher demand for heavy-duty diesel products in North America and Asia.

Net income in the year ended December 31, 2017 increased by $6 million, or 4%, with offsets driven by expenses in support of new product launches.

Movements in foreign currency exchange rates did not materially impact net sales or net income in this segment in the year ended December 31, 2017 when compared to the same period in 2016.

Outlook:

We expect high-single digit sales growth on a year-over-year basis in our Environmental Technologies segment in 2019.

Life Sciences

The following table provides net sales and net income for the Life Sciences segment:

	Years ended December 31,			% change	% change
	2018	2017	2016	18 vs. 17	17 vs. 16
Segment net sales	$ 946	$ 879	$ 839	8%	5%
Segment net income	$ 117	$ 95	$ 90	23%	6%

2018 vs. 2017

Net sales in the Life Sciences segment increased by $67 million, or 8%, in the year ended December 31, 2018, when compared to the same period in 2017, driven by strong performance across all product categories.

Net income increased by $22 million, or 23%, in the year ended December 31, 2018, driven by the reasons outlined above and improved manufacturing efficiencies.

Movements in foreign exchange rates did not materially impact net sales or net income in this period when compared to the same period in the prior year.

2017 vs. 2016

Net sales in the Life Sciences segment increased by $40 million, or 5%, in the year ended December 31, 2017, when compared to the same period in 2016, driven by strong performance in North America and China, combined with a small acquisition completed in 2017.

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Net income increased by $5 million, or 6%, in the year ended December 31, 2017, driven by an increase in volume, offset somewhat by higher raw materials costs. Movements in foreign exchange rates did not materially impact net sales or net income in this period when compared to the same period in the prior year.

Outlook:

For full-year 2019, sales are expected to grow by a low to mid-single-digit percentage on a year-over-year basis.

All Other

All other segments that do not meet the quantitative threshold for separate reporting have been grouped as "All Other." This group is primarily comprised of the results of the pharmaceutical technologies business, auto glass, new product lines and development projects, as well as certain corporate investments such as Eurokera and Keraglass equity affiliates.

The following table provides net sales and net income for All Other (in millions):

	Years ended December 31,			% change	% change
	2018	2017	2016	18 vs. 17	17 vs. 16
Segment net sales	$ 216	$ 188	$ 152	15%	24%
Segment net income	$ (281)	$ (259)	$ (220)	(8%)	(18%)

2018 vs. 2017

Net sales of this segment increased by $28 million, or 15%, in the year ended December 31, 2018, respectively, when compared to the same period in 2018, driven by an increase in sales in our emerging businesses. The increase in the net loss of $22 million, a decline of 8%, in the year ended December 31, 2017 reflects increased spending on our development projects when compared to 2017.

2017 vs. 2016

Net sales of this segment increased by $36 million, or 24%, in the year ended December 31, 2017, respectively, when compared to the same period in 2016, driven by an increase in sales in our emerging businesses. The increase in the net loss in the year ended December 31, 2017 reflects increased spending on our development projects versus the prior year.

LIQUIDITY AND CAPITAL RESOURCES

Financing and Capital Structure

The following items discuss Corning's financing and changes in capital structure during 2018 and 2017:

2018

In the second quarter of 2018, Corning issued ¥65.5 billion Japanese yen-denominated debt securities in tranches of 7, 10 and 12 years. The proceeds from these notes were received in Japanese yen and immediately converted to U.S. dollars on the date of issuance. The net proceeds received in U.S. dollars, after deducting offering expenses, was $596 million. Payments of principal and interest on the notes will be in Japanese yen, or should yen be unavailable due to circumstances beyond Corning's control, a U.S. dollar equivalent. The net proceeds of $596 million will be used for general corporate purposes.

In the third quarter of 2018, Corning amended and restated its revolving credit agreement (the "Revolving Credit Agreement"). The Revolving Credit Agreement provides a $1.5 billion unsecured multi-currency line of credit and expires August 15, 2023. The Revolving Credit Agreement includes affirmative and negative covenants with which Corning must comply, including a leverage (debt to capital ratio) financial covenant. The required leverage ratio is a maximum of 60%.

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In the fourth quarter of 2018, Corning issued $900 million U.S. dollar-denominated unsecured long-term notes in tranches of 19, 30, and 50 years. The net proceeds of $889 million will be used for general corporate purposes. We can redeem these notes at any time, subject to certain terms and conditions.

In the fourth quarter of 2018, Corning redeemed $250 million of 6.625% Notes due 2019, paying a nominal call premium. The bond redemption incurred an insignificant loss during the fourth quarter of 2018.

2017

In the third quarter of 2017, Corning issued ¥78 billion Japanese yen-denominated debt securities in tranches of 7, 10 and 20 years. The proceeds from these notes were received in Japanese yen and immediately converted to U.S. dollars on the date of issuance. The net proceeds received in U.S. dollars, after deducting offering expenses, was approximately $700 million. Payments of principal and interest on the notes will be in Japanese yen, or should yen be unavailable due to circumstances beyond Corning's control, a U.S. dollar equivalent. The net proceeds of $700 million were made available for general corporate purposes.

In the fourth quarter of 2017, Corning issued $750 million of 4.375% senior unsecured notes that mature on November 15, 2057. The net proceeds of $743 million will be used for general corporate purposes. We can redeem these notes at any time, subject to certain terms and conditions.

On a quarterly basis, Corning will recognize the transaction gains and losses resulting from changes in the JPY/USD exchange rate in the Other expense, net line of the Consolidated Statements of Income. Cash proceeds from the offerings and payments for debt issuance costs are disclosed as financing activities, and cash payments to bondholders for interest will be disclosed as operating activities, in the Consolidated Statements of Cash Flows.

Common Stock Dividends

On February 1, 2017, Corning's Board of Directors declared a 14.8% increase in the Company's quarterly common stock dividend, which increased the quarterly dividend from $0.135 to $0.155 per share of common stock, beginning with the dividend to be paid in the first quarter of 2017.

On February 6, 2018, Corning's Board of Directors declared a 16.1% increase in the Company's quarterly common stock dividend, which increased the quarterly dividend from $0.155 to $0.18 per share of common stock, beginning with the dividend to be paid in the first quarter of 2018.

On February 6, 2019, Corning's Board of Directors declared an 11.1% increase in the Company's quarterly common stock dividend, which increased the quarterly dividend from $0.18 to $0.20 per share of common stock, beginning with the dividend paid in the first quarter of 2019. This increase marks the eighth dividend increase since October 2011.

Fixed Rate Cumulative Convertible Preferred Stock, Series A

Corning has 2,300 outstanding shares of Fixed Rate Cumulative Convertible Preferred Stock, Series A. The preferred stock is convertible at the option of the holder and the Company upon certain events, at a conversion rate of 50,000 shares of Corning's common stock per one share of preferred stock, subject to certain anti-dilution provisions. As of December 31, 2018, the preferred stock has not been converted, and none of the anti-dilution provisions have been triggered.

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Customer Deposits

As of December 31, 2018 and 2017, Corning had customer deposits of approximately $1.0 billion and $0.4 billion, respectively. The majority of these represent non-refundable cash deposits for customers to secure rights to an amount of glass produced by Corning under long-term supply agreements. The duration of these long-term supply agreements ranges up to ten years. As glass is shipped to customers, Corning will recognize revenue and issue credit memoranda to reduce the amount of the customer deposit liability, which are applied against customer receivables resulting from the sale of glass. No credit memoranda were issued in 2018 and 2017.

Capital Spending

Capital spending totaled $2.2 billion in 2018, an increase of approximately $0.4 billion when compared to 2017, driven by expansions related to the Gen 10.5 glass manufacturing facilities in China, the addition of capacity to support the new gas particulate filters business in the Environmental Technologies segment, fiber and cable capacity in the Optical Communications segment and general business growth in the Specialty Materials segment. We expect our 2019 capital expenditures to be slightly more than $2.0 billion.

Cash Flows

Summary of cash flow data (in millions):

	Years ended December 31,		
	2018	2017	2016
Net cash provided by operating activities	$ 2,919	$ 2,004	$ 2,537
Net cash (used in) provided by investing activities	$ (2,887)	$ (1,710)	$ 3,662
Net cash used in financing activities	$ (1,995)	$ (1,624)	$ (5,322)

2018 vs. 2017

Net cash provided by operating activities increased by $915 million in the year ended December 31, 2018 when compared to the same period last year, primarily driven by an increase in customer incentives and deposits of $600 million. Favorable movements of $189 million in accounts payable and other current liabilities were driven largely by an increase in accounts payable in the Optical Communications segment and higher current liabilities in the Specialty Materials segment. Cash received of $104 million, which represents the excess of the fair value of the contingent consideration asset related to the acquisition of Samsung Corning Precision Materials (refer to Note 14 (Fair Value Measurements) to the Consolidated Financial Statements for additional information), also increased cash provided by operating activities.

Net cash used in investing activities increased by $1,177 million in the year ended December 31, 2018, when compared to the same period last year, driven by increased capital expenditures of $438 million due to capacity expansions, increased acquisition spending of $671million and lower gains realized on translated earnings contracts of $162 million. Cash received of $196 million, which represents the original fair value of the contingent consideration asset related to the acquisition of Samsung Corning Precision Materials (refer to Note 14 (Fair Value Measurements) to the Consolidated Financial Statements for additional information), partially offset the net cash used in investing activities.

Net cash used in financing activities in the year ended December 31, 2018 increased by $371 million when compared to the same period last year, driven by higher debt repayments, up $377 million and a decrease of $228 million for proceeds from the exercise of stock options. A decrease of $225 million in share repurchases partially offset the negative cash impact of these items.

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2017 vs. 2016

Net cash provided by operating activities decreased by $533 million in the year ended December 31, 2017 when compared to the same period last year, driven by $501 million of unfavorable movements in working capital. The negative impact of working capital changes was largely driven by an increase of $143 million in VAT receivables in Asia, a payment of $70 million related to our obligation under the plan of reorganization for PCC (refer to Note 12 (Commitments, Contingencies and Guarantees) to the Consolidated Financial Statements for additional information), an increase in accounts receivable and inventory to support growth in the Optical Communications, Environmental Technologies and Specialty Materials segments.

Net cash used in investing activities increased by $5.4 billion in the year ended December 31, 2017, when compared to the same period last year, driven by the absence of $4.8 billion of cash received in the second quarter of 2016 on the realignment of Dow Corning, coupled with an increase of $674 million in capital expenditures largely due to capacity expansions and a decline of $92 million in liquidations of short-term investments. A decline of $162 million in acquisition spending partially offset these events.

Net cash used in financing activities in the year ended December 31, 2017 decreased by $3.7 billion when compared to the same period last year, driven by lower share repurchases, down $1.8 billion, proceeds from the issuance of long-term debt of $1.4 billion, the absence of $481 million of commercial paper repayments made in 2016 and an increase of $171 million in proceeds from the exercise of stock options.

Defined Benefit Pension Plans

We have defined benefit pension plans covering certain domestic and international employees. Our largest single pension plan is Corning's U.S. qualified plan. At December 31, 2018, this plan accounted for 76% of our consolidated defined benefit pension plans' projected benefit obligation and 85% of the related plans' assets.

In 2018, we made voluntary cash contributions of $105 million to our domestic defined benefit pension plan and $12 million to our international pension plans. In 2017, we made no voluntary cash contributions to our domestic defined benefit pension plan and $29 million to our international pension plans. During 2019, we anticipate making cash contributions of $75 million to our U.S. qualified pension plan and $31 million to our international pension plans.

Refer to Note 11 (Employee Retirement Plans) to the Consolidated Financial Statements for additional information.

Key Balance Sheet Data

Balance sheet and working capital measures are provided in the following table (in millions):

	December 31, 2018	December 31, 2017
Working capital	$ 3,723	$ 5,618
Current ratio	2.1:1	2.8:1
Trade accounts receivable, net of allowances	$ 1,940	$ 1,807
Days sales outstanding	58	62
Inventories	$ 2,037	$ 1,712
Inventory turns	3.6	3.7
Days payable outstanding (1)	55	51
Long-term debt	$ 5,994	$ 4,749
Total debt to total capital	30%	25%

(1) Includes trade payables only.

Management Assessment of Liquidity

We ended the fourth quarter of 2018 with approximately $2.4 billion of cash and cash equivalents. Our cash and cash equivalents are held in various locations throughout the world and are generally unrestricted. We utilize a variety of strategies to ensure that our worldwide cash is available in the locations in which it is needed. At December 31, 2018, approximately 56% of the consolidated amount was held outside of the United States. During 2018, the Company distributed approximately $2.2 billion in cash from foreign subsidiaries to the U.S. parent. There were no incremental taxes beyond the toll charge due with respect to this distribution of cash.

To manage interest rate exposure, the Company, from time to time, enters into interest rate swap agreements. As of December 31, 2018, there are no interest rate swaps outstanding.

Corning also has a commercial paper program pursuant to which we may issue short-term, unsecured commercial paper notes up to a maximum aggregate principal amount outstanding at any one time of $1.5 billion. Under this program, the Company may issue the paper from time to time and will use the proceeds for general corporate purposes. The Company’s Revolving Credit Agreement is available to support obligations under the commercial paper program, if needed. At December 31, 2018 Corning did not have outstanding commercial paper.

Share Repurchases

During 2016, Corning repurchased 197.1 million shares for approximately $4.2 billion through an accelerated share repurchase agreement and open market repurchases as part of the 2015 Repurchase Programs. In December 2016, Corning’s Board of Directors approved a $4 billion share repurchase program with no expiration (the “2016 Repurchase Program”).

During 2017, Corning repurchased 84.4 million shares for approximately $2.4 billion through accelerated share repurchase agreements and open market repurchases under the 2016 Repurchase Program.

During 2018, Corning repurchased 74.8 million shares for approximately $2.2 billion through open market repurchases under the 2016 and 2018 Repurchase Programs.

Refer to Note 15 (Shareholders' Equity) to the Consolidated Financial Statements for additional information.

Other

We complete comprehensive reviews of our significant customers and their creditworthiness by analyzing their financial strength at least annually or more frequently for customers where we have identified a measure of increased risk. We closely monitor payments and developments which may signal possible customer credit issues. We currently have not identified any potential material impact on our liquidity resulting from customer credit issues.

Our major source of funding for 2019 and beyond will be our operating cash flow, our existing balances of cash and cash equivalents and proceeds from any issuances of debt. We believe we have sufficient liquidity to fund operations, acquisitions, capital expenditures, scheduled debt repayments, dividend payments and share repurchase programs.

Our Revolving Credit Agreement includes affirmative and negative covenants with which we must comply, including a leverage (debt to capital ratio) financial covenant. The required leverage ratio is a maximum of 60%. At December 31, 2018, our leverage using this measure was approximately 30%. As of December 31, 2018, we were in compliance with this financial covenant.

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Our debt instruments contain customary event of default provisions, which allow the lenders the option of accelerating all obligations upon the occurrence of certain events. In addition, some of our debt instruments contain a cross default provision, whereby an uncured default in excess of a specified amount on one debt obligation of the Company, also would be considered a default under the terms of another debt instrument. As of December 31, 2018, we were in compliance with all such provisions.

Management is not aware of any known trends or any known demands, commitments, events or uncertainties that will result in or that are reasonably likely to result in a material decrease in our liquidity. In addition, other than items discussed, there are no known material trends, favorable or unfavorable, in our capital resources and no expected material changes in the mix and relative cost of such resources.

Translated Earnings Contracts

Corning has hedged a significant portion of its projected yen exposure for the period 2018 through 2022, with average rate forwards, collars and puts. In the years ended December 31, 2018, 2017 and 2016, we recorded pre-tax net losses of $96 million, $201 million and $459 million related to changes in the fair value of these instruments. Included in these amounts are realized gains of $64 million, $268 million and $207 million, respectively. The gross notional value outstanding for these instruments which hedge our exposure to the Japanese yen at December 31, 2018, 2017 and 2016 was $11.6 billion, $13 billion and $14.9 billion, respectively.

We have entered into zero-cost collars and average rate forwards to hedge our translation exposure resulting from movements in the South Korean won and its impact on our net income. In the year ended December 31, 2018, we recorded a pre-tax net loss of $26 million, and in the years ended December 31, 2017 and 2016, we recorded pre-tax net gains of $95 million and $7 million, respectively, related to changes in the fair value of these instruments. Included in these amounts is a realized gain of $46 million, and realized losses of $1 million and $7 million, respectively. These instruments had a gross notional value outstanding at December 31, 2018, 2017 and 2016 of $0.1 billion, $0.8 billion and $1.2 billion, respectively.

We have entered into a portfolio average rate forwards to hedge against our euro translation exposure. In the years ended December 31, 2018, 2017 and 2016, we recorded a pre-tax gain of $43 million, a net pre-tax loss of $40 million, and a net pre-tax gain of $15 million, respectively. Included in these amounts are realized losses of $14 million and $2 million, and a realized gain of $1 million, respectively. At December 31, 2018, the euro-denominated average rate instruments had a gross notional amount of $1.2 billion, and at 2017 and 2016, a gross notional amount of $0.3 billion.

These derivative instruments are not designated as accounting hedges, and changes in fair value are recorded in earnings in the translated earnings contract loss, net line of the Consolidated Statements of Income (Loss).

Off Balance Sheet Arrangements

Off balance sheet arrangements are transactions, agreements, or other contractual arrangements with an unconsolidated entity for which Corning has an obligation to the entity that is not recorded in our consolidated financial statements.

Corning's off balance sheet arrangements include guarantee contracts. At the time a guarantee is issued, the Company is required to recognize a liability for the fair value or market value of the obligation it assumes. In the normal course of our business, we do not routinely provide significant third-party guarantees. Generally, third-party guarantees provided by Corning are limited to certain financial guarantees, including stand-by letters of credit and performance bonds, and the incurrence of contingent liabilities in the form of purchase price adjustments related to attainment of milestones. These guarantees have various terms, and none of these guarantees are individually significant.

Refer to Note 12 (Commitments, Contingencies and Guarantees) to the Consolidated Financial Statements for additional information.

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For variable interest entities, we assess the terms of our interest in each entity to determine if we are the primary beneficiary. The primary beneficiary of a variable interest entity is the party that absorbs a majority of the entity's expected losses, receives a majority of its expected residual returns, or both, as a result of holding variable interests, which are the ownership, contractual, or other pecuniary interests in an entity that change with changes in the fair value of the entity's net assets excluding variable interests.

Corning has identified ten entities that qualify as a variable interest entity and are not consolidated. These entities are not considered to be significant to Corning's consolidated statements of position.

Corning does not have retained interests in assets transferred to an unconsolidated entity that serve as credit, liquidity or market risk support to that entity.

Contractual Obligations

The amounts of our obligations follow (in millions):

		Amount of commitment and contingency expiration per period			
	Total	Less than 1 year	1 to 3 years	3 to 5 years	5 years and thereafter
Performance bonds and guarantees	$ 152	$ 23	$ 4	$ 2	$ 123
Stand-by letters of credit (1)	84	71	8		5
Credit facility to equity company	4	4			
Subtotal of commitment expirations per period	$ 240	$ 98	$ 12	$ 2	$ 128
Purchase obligations (2)	$ 339	$ 214	$ 56	$ 28	$ 41
Capital expenditure obligations (3)	412	412			
Total debt (4)	5,642		362	670	4,610
Interest on long-term debt (5)	5,117	231	450	408	4,028
Capital leases and financing obligations	393	4	11	132	246
	205	20	38	37	110

Imputed interest on capital leases and financing obligations					
Minimum rental commitments	581	82	133	111	255
Amended PCC Plan	185	50	85	50	
Uncertain tax positions (6)	95				
Subtotal of contractual obligation payments due by period (6)	$ 12,969	$ 1,013	$ 1,135	$ 1,436	$ 9,290
Total commitments and contingencies (6)	$ 13,209	$ 1,111	$ 1,147	$ 1,438	$ 9,418

(1) At December 31, 2018, $39 million of the $84 million was included in other accrued liabilities on our consolidated balance sheets.
(2) Purchase obligations are enforceable and legally binding obligations which primarily consist of raw material and energy-related take-or-pay contracts.
(3) Capital expenditure obligations primarily reflect amounts associated with our capital expansion activities.
(4) Total debt above is stated at maturity value, and excludes interest rate swap gains/losses and bond discounts.
(5) The estimate of interest payments assumes interest is paid through the date of maturity or expiration of the related debt, based upon stated rates in the respective debt instruments.
(6) At December 31, 2018, $95 million was included on our balance sheet related to uncertain tax positions.

We believe a significant majority of these guarantees and contingent liabilities will expire without being funded.

ENVIRONMENT

Refer to Item 3. Legal Proceedings or Note 12 (Commitments, Contingencies and Guarantees) to the Consolidated Financial Statements for information.

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CRITICAL ACCOUNTING ESTIMATES

The preparation of financial statements requires us to make estimates and assumptions that affect amounts reported therein. The estimates that required us to make difficult, subjective or complex judgments, including future projections of performance and relevant discount rates, are set forth below.

Acquired assets and liabilities

We account for the acquisition of a business using the purchase method of accounting, which requires us to estimate the fair values of the assets acquired and liabilities assumed. This includes acquired intangible assets such as customer-related intangibles and patents, fixed assets and inventories. Liabilities assumed may include litigation and other contingency reserves existing at the time of acquisition and require judgment in ascertaining the related fair values. Independent appraisals may be used to assist in the determination of the fair value of certain assets and liabilities. Such appraisals are based on significant estimates provided by us, such as forecasted revenues and profits utilized in determining the fair value of contract-related acquired intangible assets or liabilities. Significant changes in assumptions and estimates subsequent to completing the allocation of the purchase price to the assets and liabilities acquired, as well as differences in actual and estimated results could result in impacts to our financial results. Additional information related to the acquisition date fair value of acquired assets and liabilities obtained during the allocation period, not to exceed one year, may result in changes to the recorded values of acquired assets and liabilities, resulting in an offsetting adjustment to the goodwill associated with the business acquired.

In 2018 we acquired CMD from 3M in a business combination. Included in the acquisition were other intangible assets consisting primarily of $434 million of customer relationships and $91 million of other intangibles that are amortized over the weighted average useful life of approximately 14 and 11 years, respectively.   The customer relationship intangible asset was valued using the Multi-Period Excess Earnings Valuation Method, which is an income approach method that estimates fair value of revenue based upon the present value of cash flows that are expected to be generated from the acquired customer base. Key assumptions used in this valuation include a discount rate of 12.5%, revenue growth rates in the range of 0% to 3% and a customer attrition rate of 6%.

Impairment of assets held for use

We are required to assess the recoverability of the carrying value of long-lived assets when an indicator of impairment has been identified. We review our long-lived assets in each quarter to assess whether impairment indicators are present. We must exercise judgment in assessing whether an event of impairment has occurred.

Manufacturing equipment includes certain components of production equipment that are constructed of precious metals, primarily platinum and rhodium. These metals are not depreciated because they have very low physical losses and are repeatedly reclaimed and reused in our manufacturing process over a very long useful life. Precious metals are reviewed for impairment as part of our assessment of long-lived assets. This review considers all the Company's precious metals that are either in place in the production process; in reclamation, fabrication, or refinement in anticipation of re-use; or awaiting use to support increased capacity. Precious metals are only acquired to support our operations and are not held for trading or other non-manufacturing related purposes.

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Examples of events or circumstances that may be indicative of impairments include, but are not limited to:

- A significant decrease in the market price of an asset;
- A significant change in the extent or manner in which a long-lived asset is being used or in its physical condition;
- A significant adverse change in legal factors or in the business climate that could affect the value of the asset, including an adverse action or assessment by a regulator;
- An accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of an asset;
- A current-period operating or cash flow loss combined with a history of operating or cash flow losses or a projection or forecast that demonstrates continuing losses associated with the use of an asset; and
- A current expectation that, more likely than not, an asset will be sold or otherwise disposed of significantly before the end of its previously estimated useful life.

For purposes of recognition and measurement of an impairment loss, a long-lived asset or assets is grouped with other assets and liabilities at the lowest level for which identifiable cash flows are largely independent of the cash flows of other assets and liabilities. We must exercise judgment in assessing the lowest level for which identifiable cash flows are largely independent of the cash flows of other assets and liabilities. Our assessment is performed at the reportable segment level. For the majority of our reportable segments, we concluded that locations or businesses within these segments which share production along the supply chain must be combined to appropriately identify cash flows that are largely independent of the cash flows of other assets and liabilities.

For long-lived assets, when impairment indicators are present, we compare estimated undiscounted future cash flows, including the eventual disposition of the asset group at market value, to the assets' carrying value to determine if the asset group is recoverable. This assessment requires the exercise of judgment in assessing the future use of and projected value to be derived from the assets to be held and used. Assessments also consider changes in asset utilization, including the temporary idling of capacity and the expected timing for placing this capacity back into production. If there is an impairment, a loss is recorded to reflect the difference between the assets' fair value and carrying value. This may require judgment in estimating future cash flows and relevant discount rates and residual values in estimating the current fair value of the impaired assets to be held and used.

For an asset group that fails the test of recoverability, the estimated fair value of long-lived assets is determined using an "income approach" that starts with the forecast of all the expected future net cash flows including the eventual disposition at market value of long-lived assets, and considers the fair market value of all precious metals. We assess the recoverability of the carrying value of long-lived assets at the lowest level for which identifiable cash flows are largely independent of the cash flows of other assets and liabilities. If there is an impairment, a loss is recorded to reflect the difference between the assets' fair value and carrying value. Our estimates are based upon our historical experience, our commercial relationships, and available external information about future trends. We believe fair value assessments are most sensitive to market growth and the corresponding impact on volume and selling prices and that these are also more subjective than manufacturing cost and other assumptions. The Company believes its current assumptions and estimates are reasonable and appropriate.

At December 31, 2018 and December 31, 2017, the carrying value of precious metals was higher than the fair market value by $719 million and $711 million, respectively. The majority of these precious metals are utilized by the Display Technologies and Specialty Materials segments. Corning believes these precious metal assets to be recoverable due to the significant positive cash flow in both segments. The potential for impairment exists in the future if negative events significantly decrease the cash flow of these segments. Such events include, but are not limited to, a significant decrease in demand for products or a significant decrease in profitability in our Display Technologies or Specialty Materials segments.

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Impairment of Goodwill

We are required to make certain subjective and complex judgments in assessing whether an event of impairment of goodwill has occurred, including assumptions and estimates used to determine the fair value of our reporting units. Goodwill is tested for impairment at the reporting unit level. A reporting unit is equivalent to an operating segment or a component of an operating segment which constitutes a business and for which discrete financial information is regularly reviewed by segment management. An impairment loss generally would be recognized when the carrying amount of a reporting unit's net assets exceeds the estimated fair value of the reporting unit.

Corning has recorded goodwill in the Display Technologies, Optical Communications, Specialty Materials, Life Sciences and All Other operating segments. Each of these operating segments is a separate reporting unit; however, Specialty Materials and All Other are each made up of two separate reporting units. On a quarterly basis, or if an event occurs or circumstances change that indicate the carrying amount may be impaired, management performs a qualitative assessment of factors in each reporting unit within these operating segments to determine if there have been any triggering events. We also perform a detailed quantitative impairment test every three years if no indicators suggest a test should be performed in the interim. We use this calculation as a quantitative validation of the qualitative process; this process does not represent an election to perform the quantitative impairment test in place of the qualitative review.

The qualitative assessment is performed by assessing various factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. These factors include, but are not limited to, changes in macroeconomic conditions, industry and market considerations, cost factors, overall financial performance, other relevant entity-specific events, or a sustained decrease in share price.

In 2018, we performed a quantitative goodwill impairment assessment in addition to assessing the qualitative factors each quarter. Our assessment is based on our annual strategic planning process. This process includes an extensive review of expectations for the long-term growth of our businesses and forecasted future cash flows. Our valuation method is an "income approach" using a discounted cash flow model in which cash flows anticipated over several periods, plus a terminal value at the end of that time horizon, are discounted to present value using an appropriate discount rate. Our estimates are based upon our historical experience, our current knowledge from our commercial relationships, and available external information about future trends. The quantitative assessment requires the exercise of significant judgment, including judgment about appropriate discount rates, growth rates and the timing of expected future cash flows of the respective reporting unit.

The quantitative assessment of goodwill resulted in fair values significantly exceeding the carrying values for all of our reporting units. We also performed a sensitivity analysis, using a range between 7-10% for the discount rate and 0%-3% for the growth rate, which had no material impact on our results. Based on the quantitative test performed in

2018, no goodwill impairment was required.

Income taxes

We are required to exercise judgment about our future results in assessing the realizability of our deferred tax assets. Inherent in this estimation process is the requirement for us to estimate future book and taxable income and possible tax planning strategies. These estimates require us to exercise judgment about our future results, the prudence and feasibility of possible tax planning strategies, and the economic environments in which we do business. It is possible that actual results will differ from assumptions and require adjustments to allowances.

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Corning accounts for uncertain tax positions in accordance with ASC Topic 740, Income Taxes, which requires that companies only record tax benefits for technical positions that are believed to have a greater than 50% likelihood of being sustained on their technical merits and then only to the extent of the amount of tax benefit that is greater than 50% likely of being realized upon settlement. In estimating these amounts, we must exercise judgment around factors such as the weighting of the tax law in our favor, the willingness of a tax authority to aggressively pursue a particular position, or alternatively, consider a negotiated compromise, and our willingness to dispute a tax authorities' assertion to the level of appeal we believe is required to sustain our position. As a result, it is possible that our estimate of the benefits we will realize for uncertain tax positions may change when we become aware of new information affecting these judgments and estimates.

As of December 31, 2018, Corning has completed its analysis of the impact of the 2017 Tax Act as required by SAB 118.

Beginning in 2018, Corning will indefinitely reinvest the foreign earnings of: (1) any of its subsidiaries located in jurisdictions where Corning lacks the ability to repatriate its earnings, (2) any of its subsidiaries where Corning's intention is to reinvest those earnings in operations, (3) legal entities for which Corning holds a non-controlling interest, (4) any subsidiaries with an accumulated deficit in earnings and profits and (5) any subsidiaries which have a positive earnings and profits balance but for which the entity lacks sufficient local statutory earnings or stock basis from which to make a distribution.

Under the 2017 Tax Act, a company can make a policy election to account for the tax on GILTI as a period cost or to recognize deferred tax assets and liabilities when basis differences exist that are expected to affect the amount of GILTI inclusion upon reversal. Corning has elected to account for the GILTI provisions as a period cost.

Fair value measures

As required, Corning uses two kinds of inputs to determine the fair value of assets and liabilities: observable and unobservable. Observable inputs are based on market data or independent sources, while unobservable inputs are based on the Company's own market assumptions. Once inputs have been characterized, we prioritize the inputs used to measure fair value into one of three broad levels. Characterization of fair value inputs is required for those accounting pronouncements that prescribe or permit fair value measurement. In addition, observable market data must be used when available and the highest-and-best-use measure should be applied to non-financial assets. Corning's major categories of financial assets and liabilities required to be measured at fair value are short-term and long-term investments, certain pension asset investments and derivatives. These categories use observable inputs only and are measured using a market approach based on quoted prices in markets considered active or in markets in which there are few transactions.

Derivative assets and liabilities may include interest rate swaps and forward exchange contracts that are measured using observable quoted prices for similar assets and liabilities. Included in our forward exchange contracts are foreign currency hedges that hedge our translation exposure resulting from movements in the Japanese yen, South Korean won, euro, New Taiwan dollar, Chinese yuan and British pound. These contracts are not designated as accounting hedges, and changes in fair value are recorded in earnings in the translated earnings contract loss, net line of the Consolidated Statements of Income (Loss). In arriving at the fair value of Corning's derivative assets and liabilities, we have considered the appropriate valuation and risk criteria, including such factors as credit risk of the relevant party to the transaction. Amounts related to credit risk are not material.

Refer to Note 14 (Fair Value Measurements) to the Consolidated Financial Statements for additional information.

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Probability of litigation outcomes

We are required to make judgments about future events that are inherently uncertain. In making determinations of likely outcomes of litigation matters, we consider the evaluation of legal counsel knowledgeable about each matter, case law, and other case-specific issues. See Part II – Item 3. Legal Proceedings for a discussion of Corning's material litigation matters.

Other possible liabilities

We are required to make judgments about future events that are inherently uncertain. In making determinations of likely outcomes of certain matters, including certain tax planning and environmental matters, these judgments require us to consider events and actions that are outside our control in determining whether probable or possible liabilities require accrual or disclosure. It is possible that actual results will differ from assumptions and require adjustments to accruals.

Pension and other postretirement employee benefits (OPEB)

Corning offers employee retirement plans consisting of defined benefit pension plans covering certain domestic and international employees and postretirement plans that provide health care and life insurance benefits for eligible retirees and dependents. The costs and obligations related to these benefits reflect the Company's assumptions related to general economic conditions (particularly interest rates), expected return on plan assets, rate of compensation increase for employees and health care trend rates. The cost of providing plan benefits depends on demographic assumptions including retirements, mortality, turnover and plan participation. While management believes that the assumptions used are appropriate, differences in actual experience or changes in assumptions may affect Corning's employee pension and other postretirement obligations, and current and future expense.

Costs for our defined benefit pension plans consist of two elements: 1) on-going costs recognized quarterly, which are comprised of service and interest costs, expected return on plan assets and amortization of prior service costs; and 2) mark-to-market gains and losses outside of the corridor, where the corridor is equal to 10% of the greater of the benefit obligation or the market-related value of plan assets at the beginning of the year, which are recognized annually in the fourth quarter of each year. These gains and losses result from changes in actuarial assumptions and the differences between actual and expected return on plan assets. Any interim remeasurements triggered by a curtailment, settlement or significant plan changes, as well as any true-up to the annual valuation, are recognized as a mark-to-market adjustment in the quarter in which such event occurs.

Costs for our OPEB plans consist of on-going costs recognized quarterly, and are comprised of service and interest costs, amortization of prior service costs and amortization of actuarial gains and losses. We recognize the actuarial gains and losses resulting from changes in actuarial assumptions as a component of Stockholders' Equity on our consolidated balance sheets on an annual basis and amortize them into our operating results over the average remaining service period of employees expected to receive benefits under the plans, to the extent such gains and losses are outside of the corridor.

On January 1, 2018, Corning adopted ASU No. 2017-07, Compensation Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Post-Retirement Benefit Cost, which presents the service cost component with other current compensation costs in operating income. The remaining components are included in the line item Other expense, net, in the Consolidated Statements of Income (Loss). Corning applied the practical expedient as the estimation basis for applying the retrospective presentation requirements.

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The following tables present our actual and expected return on assets, as well as the corresponding percentage, for the years ended 2018, 2017 and 2016:

	December 31,		
(In millions)	2018	2017	2016
Actual return on plan assets – Domestic plans	$ (202)	$ 393	$ 235
Expected return on plan assets – Domestic plans	178	163	153
Actual return on plan assets – International plans	1	18	75
Expected return on plan assets – International plans	11	11	12

	December 31,		
	2018	2017	2016
Weighted-average actual and expected return on assets:			
Actual return on plan assets – Domestic plans	(6.83)%	14.92%	9.62%
Expected return on plan assets – Domestic plans	6.00%	6.00%	6.00%
Actual return on plan assets – International plans	(0.06)%	3.93%	19.06%
Expected return on plan assets – International plans	2.13%	3.97%	3.92%

As of December 31, 2018, the Projected Benefit Obligation (PBO) for U.S. pension plans was $3.4 billion.

The following information illustrates the sensitivity to a change in certain assumptions for U.S. pension plans:

Change in assumption	Effect on 2019 pre-tax pension expense	Effect on December 31, 2018 PBO
25 basis point decrease in each spot rate	- 2 million	+ 91 million
25 basis point increase in each spot rate	+ 2 million	- 87 million
25 basis point decrease in expected return on assets	+ 7 million	
25 basis point increase in expected return on assets	- 7 million	

The above sensitivities reflect the impact of changing one assumption at a time. Note that economic factors and conditions often affect multiple assumptions simultaneously and the effects of changes in key assumptions are not necessarily linear. These changes in assumptions would have no effect on Corning's funding requirements.

In addition, at December 31, 2018, a 25 basis point decrease in each spot rate would decrease stockholders' equity by $112 million before tax, and a 25 basis point increase in each spot rate would increase stockholders' equity by $107 million. In addition, the impact of greater than a 25 basis point decrease in each spot rate would not be proportional to the first 25 basis point decrease in each spot rate.

The following table illustrates the sensitivity to a change in each spot rate assumption related to Corning's U.S. OPEB plans:

Change in assumption	Effect on 2019 pre-tax OPEB expense	Effect on December 31, 2018 APBO*
25 basis point decrease in each spot rate	- 0 million	+ 21 million
25 basis point increase in each spot rate	+ 0 million	- 20 million

*   Accumulated Postretirement Benefit Obligation (APBO).

The above sensitivities reflect the impact of changing one assumption at a time. Note that economic factors and conditions often affect multiple assumptions simultaneously and the effects of changes in key assumptions are not necessarily linear.

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Revenue recognition

The Company recognizes revenue when all performance obligations under the terms of a contract with our customer are satisfied, and control of the product has been transferred to the customer. If customer acceptance clauses are present and it cannot be objectively determined that control has been transferred, revenue is only recorded when customer acceptance is received and all performance obligations have been satisfied. Sales of goods typically do not include multiple product and/or service elements. Corning also has contractual arrangements with certain customers in which we recognize revenue over time. The performance obligations under these contracts generally require services to be performed over time, resulting in either a straight-line amortization method or an input method using incurred and forecasted expense to predict revenue recognition patterns which follows satisfaction of the performance obligation.

On January 1, 2018, we adopted Accounting Standards Update ("ASU") No. 2014-09 ASC (Topic 606), Revenue from Contracts with Customers, and applied the modified retrospective method of accounting to those contracts which were not completed as of January 1, 2018. Results for reporting periods beginning after January 1, 2018 are presented under Topic 606, while prior period amounts are not adjusted and continue to be reported in accordance with our historic accounting under ASC Topic 605 "Revenue Recognition". Because the impact of adopting the standard on Corning's financial statements was immaterial, we have not made an adjustment to opening retained earnings.

NEW ACCOUNTING STANDARDS

Refer to Note 1 (Summary of Significant Accounting Policies) to the Consolidated Financial Statements.

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FORWARD-LOOKING STATEMENTS

The statements in this Annual Report on Form 10-K, in reports subsequently filed by Corning with the Securities and Exchange Commission (SEC) on Form 10-Q and Form 8-K, and related comments by management that are not historical facts or information and contain words such as “will,” “believe,” “anticipate,” “expect,” “intend,” “plan,” “seek,” “se “would,” and “target” and similar expressions are forward-looking statements. Such statements relate to future events that by their nature address matters that are, to different degrees, uncertain. These forward-looking statements relate to, among other things, the Company’s future operating performance, the Company’s share of new and existing markets, the Company’s revenue and earnings growth rates, the Company’s ability to innovate and commercialize new products, and the Company’s implementation of cost-reduction initiatives and measures to improve pricing, including the optimization of the Company’s manufacturing capacity.

Although the Company believes that these forward-looking statements are based upon reasonable assumptions regarding, among other things, current estimates and forecasts, general economic conditions, its knowledge of its business, and key performance indicators that impact the Company, actual results could differ materially. The Company does not undertake to update forward-looking statements. Some of the risks, uncertainties and other factors that could cause actual results to differ materially from those expressed in or implied by the forward-looking statements include, but are not limited to:

- global business, financial, economic and political conditions;
- tariffs and import duties;
- currency fluctuations between the U.S. dollar and other currencies, primarily the Japanese yen, New Taiwan dollar, euro, Chinese yuan and South Korean won;
- product demand and industry capacity;
- competitive products and pricing;
- availability and costs of critical components and materials;
- new product development and commercialization;
- order activity and demand from major customers;
- the amount and timing of our cash flows and earnings and other conditions, which may affect our ability to pay our quarterly dividend at the planned level or to repurchase shares at planned levels;
- possible disruption in commercial activities due to terrorist activity, cyber-attack, armed conflict, political or financial instability, natural disasters, or major health concerns;
- loss of intellectual property due to theft, cyber-attack, or disruption to our information technology infrastructure;
- unanticipated disruption to equipment, facilities, IT systems or operations;
- effect of regulatory and legal developments;
- ability to pace capital spending to anticipated levels of customer demand;
- rate of technology change;
- ability to enforce patents and protect intellectual property and trade secrets;
- adverse litigation;

- product and components performance issues;
- retention of key personnel;
- customer ability, most notably in the Display Technologies segment, to maintain profitable operations and obtain financing to fund ongoing operations and manufacturing expansions and pay receivables when due;
- loss of significant customers;
- changes in tax laws and regulations including the 2017 Tax Act;
- the impacts of audits by taxing authorities;
- the potential impact of legislation, government regulations, and other government action and investigations; and
- other risks detailed in Corning's SEC filings.

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Item 7A. Quantitative and Qualitative Disclosures About Market Risks

We operate and conduct business in many foreign countries and as a result are exposed to movements in foreign currency exchange rates. Our exposure to exchange rates has the following effects:

- Exchange rate movements on financial instruments and transactions denominated in foreign currencies that impact earnings; and
- Exchange rate movements upon conversion of net assets and net income of foreign subsidiaries for which the functional currency is not the U.S. dollar, which impact our net equity.

Our most significant foreign currency exposures relate to the Japanese yen, South Korean won, New Taiwan dollar, Chinese yuan, and the euro. We seek to mitigate the impact of exchange rate movements in our income statement by using over-the-counter (OTC) derivative instruments including foreign exchange forward and option contracts. In general, these hedges expire coincident with the timing of the underlying foreign currency commitments and transactions.

We are exposed to potential losses in the event of non-performance by our counterparties to these derivative contracts. However, we minimize this risk by maintaining a diverse group of highly-rated major financial institutions as our counterparties. We do not expect to record any losses as a result of such counterparty default. Neither we nor our counterparties are required to post collateral for these financial instruments.

Our cash flow hedging activities utilize OTC foreign exchange forward contracts to reduce the risk that movements in exchange rates will adversely affect the net cash flows resulting from the sale of products to foreign customers and purchases from foreign suppliers. We also use OTC foreign exchange forward and option contracts that are not designated as hedging instruments for accounting purposes. The undesignated hedges limit exposures to foreign functional currency fluctuations related to certain subsidiaries' monetary assets, monetary liabilities and net earnings in foreign currencies. A significant portion of the Company's non-U.S. revenues are denominated in Japanese yen. When these revenues are translated back to U.S. dollars, the Company is exposed to foreign exchange rate movements in the Japanese yen. To protect translated earnings against movements in the Japanese yen, the Company has entered into a series of average rate forwards and other derivative instruments.

We use a sensitivity analysis to assess the market risk associated with our foreign currency exchange risk. Market risk is defined as the potential change in fair value of assets and liabilities resulting from an adverse movement in foreign currency exchange rates. At December 31, 2018, with respect to open foreign exchange forward and option contracts, and foreign denominated debt with values exposed to exchange rate movements, a 10% adverse movement in quoted foreign currency exchange rates could result in a loss in fair value of these instruments of $1.1 billion compared to

$1.4 billion at December 31, 2017. Specific to the Japanese yen, a 10% adverse movement in quoted yen exchange rates could result in a loss in fair value of these instruments of $1.0 billion compared to $1.3 billion at December 31, 2017. The Company expects that these hypothetical losses from a 10% adverse movement in quoted foreign currency exchange rates on the derivative financial instruments should largely offset gains on the assets, liabilities and future transactions being hedged.

Interest Rate Risk Management

To manage interest rate exposure, the Company, from time to time, enters into interest rate derivatives agreements. In the second quarter of 2018, the Company entered into Treasury rate lock agreements with notional amounts of $300 million to hedge against the variability in cash flows due to changes in the benchmark interest rate related to an anticipated debt issuance. The instruments were designated as cash flow hedges, and were settled with $16 million received on October 31, 2018 concurrent with the debt issuance.

Item 8. Financial Statements and Supplementary Data

See Item 15 (a) 1.

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Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Disclosure Controls and Procedures

Our principal executive and principal financial officers, after evaluating the effectiveness of our disclosure controls and procedures (as defined in the Securities Exchange Act of 1934 (Exchange Act) Rules 13a-15(e) or 15d-15(e)) as of the end of the period covered by this report, have concluded that based on the evaluation of these controls and procedures required by paragraph (b) of Exchange Act Rules 13a-15 or 15d-15, that our disclosure controls and procedures were effective.

Internal Control Over Financial Reporting

(a) Management's Annual Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate disclosure controls and procedures and adequate internal control over financial reporting for Corning. Management is also responsible for the assessment of the effectiveness of disclosure controls and procedures and the effectiveness of internal control over financial reporting.

Disclosure controls and procedures mean controls and other procedures of an issuer that are designed to ensure that information required to be disclosed by the issuer in the reports that it files or submits under the Exchange Act is recorded, processed, summarized, and reported, within the time periods specified in the SEC's rules and forms. Corning's disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by Corning in the reports that it files or submits under the Exchange Act is accumulated and communicated to Corning's management, including Corning's principal executive and principal financial officers, or other persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure.

Corning'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 accounting principles generally accepted in the United States of America. Corning'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 Corning's assets; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with accounting principles generally accepted in the United States of America, and that Corning's receipts and expenditures are being made only in accordance with authorizations of Corning's management and directors; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of Corning'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 and procedures may deteriorate.

Management conducted an evaluation of the effectiveness of the system of internal control over financial reporting based on the framework in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Management's assessment of internal control over financial reporting includes controls over recognition of equity earnings and equity investments by Corning. Internal control over financial reporting for Hemlock Semiconductor Group is the responsibility of its management.

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Corning acquired substantially all of CMD during 2018, and management excluded CMD from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2018. CMD's internal control over financial reporting is associated with less than 1% of total assets and 2% of net sales included in the consolidated financial statements of the Company and its subsidiaries as of and for the year ended December 31, 2018.

Based on this evaluation, management concluded that Corning's internal control over financial reporting was effective as of December 31, 2018. The effectiveness of Corning's internal control over financial reporting as of December 31, 2018, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included herein.

(b)Attestation Report of the Independent Registered Public Accounting Firm

Refer to Part IV, Item 15.

(c)Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting identified in connection with the evaluation required by paragraph (d) of Exchange Act Rules 13a-15 or 15d-15 that occurred during our last fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

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PART III

Item 10. Directors, Executive Officers and Corporate Governance

The sections entitled “Proposal 1 Election of Directors,” “Section 16(a) Beneficial Ownership Reporting Compliance” and “Corporate Governance and the Board of Directors-Committees” in our Definitive Proxy Statement relating to our Annual Meeting of Shareholders to be held on May 2, 2019 are incorporated by reference in this Annual Report on Form 10-K. Information regarding executive officers is presented in Item I of this Annual Report on Form 10-K under the caption “Executive Officers of the Registrant.”

Code of Ethics

Our Board of Directors adopted (i) the Code of Ethics for the Chief Executive Officer and Financial Executives (Code of Ethics) and (ii) the Code of Conduct for Directors and Executive Officers, which supplement our Code of Conduct that governs all employees and directors. These Codes have been in existence for more than ten years. The Code of Ethics applies to our Chief Executive Officer, Chief Financial Officer, Controller and other financial executives. During 2018, no amendments to or waivers of the provisions of the Code of Ethics were made with respect to any of our directors or executive officers. A copy of the Code of Ethics is available on our website at http://www.corning.com/worldwide/en/about-us/investor-relations/codes-of-conduct-ethics.html. We will also provide a copy of the Code of Ethics to shareholders without charge upon written request to Corporate Secretary, Corning Incorporated, Corning, NY 14831. We will disclose future amendments to, or waivers from, the Code of Ethics on our website within four business days following the date of such amendment or waiver.

Item 11. Executive Compensation

The sections entitled “Compensation Discussion and Analysis” and “Director Compensation” in our Definitive Proxy Statement relating to the Annual Meeting of Shareholders to be held on May 2, 2019, are incorporated by reference in this Annual Report on Form 10-K.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The sections entitled “Beneficial Ownership of Directors and Officers” and “Beneficial Ownership of Corning’s Largest Shareholders” in our Definitive Proxy Statement relating to the Annual Meeting of Shareholders to be held on May 2, 2019, are incorporated by reference in this Annual Report on Form 10-K.

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Equity Compensation Plan Information

The following table shows the total number of outstanding stock options and shares available for other future issuances of options under our existing equity compensation plans as of December 31, 2018, including the 2010 Equity Plan for Non-Employee Directors and 2012 Long-Term Incentive Plan:

	A	B	C
	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	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 (1)	20,285,069	$ 14.68	61,767,482
Equity compensation plans not approved by security holders			
Total	20,285,069	$ 14.68	61,767,482

(1)Shares indicated are total grants under the most recent shareholder approved plans as well as any shares remaining outstanding from any prior shareholder approved plans.

Item 13. Certain Relationships and Related Transactions and Director Independence

The sections entitled “Policy on Transactions with Related Persons”, “Director Independence” and “Corporate Governance and the Board of Directors-Committees” in our Definitive Proxy Statement relating to the Annual Meeting of Shareholders to be held on May 2, 2019, are incorporated by reference in this Annual Report on Form 10-K.

Item 14. Principal Accounting Fees and Services

The sections entitled “Fees Paid to Independent Registered Public Accounting Firm” and “Policy Regarding Audit Committee Pre-Approval of Audit and Permitted Non-Audit Services of Independent Registered Public Accounting Firm” in our Definitive Proxy Statement relating to the Annual Meeting of Shareholders to be held on May 2, 2019, are incorporated by reference in this Annual Report on Form 10-K.

In April 2018, PricewaterhouseCoopers LLP (PwC) issued its annual Public Company Accounting Oversight Board Rule 3526 independence letter to the Audit Committee of our Board of Directors and therein reported that it is independent under applicable standards in connection with its audit opinion for the financial statements contained in this report. The Audit Committee has discussed with PwC its independence from Corning, and concurred with PwC.

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PART IV

Item 15. Exhibits, Financial Statement Schedules

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(a) Documents filed as part of this report:

(b) Exhibits filed as part of this report:

2.1 Framework Agreement, dated as of October 22, 2013, by and among Samsung Display Co., Ltd.; Corning Incorporated and the other parties thereto. (Incorporated by reference to Exhibit 10.65 to Corning's Form 10-K filed on February 10, 2014, as amended by its Form 10-K/A filed on March 21, 2014). The Company has omitted certain schedules, exhibits and similar attachments to the Framework Agreement pursuant to Item 601(b)(2) of Regulation S-K.

2.2 Transaction Agreement, dated December 10, 2015, by and between Corning Incorporated, The Dow Chemical Company, Dow Corning Corporation and HS Upstate Inc. (Incorporated by reference to Exhibit 1.1 of Corning's Form 8-K filed on December 11, 2015).

2.3 Assignment Agreement, dated as of December 29, 2015, between Samsung Display Co., Ltd., Corning Incorporated, Corning Precision Materials Co., Ltd., and Corning Luxembourg S.àr.l., Corning Hungary Data Services Limited Liability Company, Corning Japan K.K., and Samsung Corning Advanced Glass LLC (Incorporated by reference to Exhibit 2.1 of Corning's Form 8-K filed on December 29, 2015).

3 (i) Restated Certificate of Incorporation dated April 27, 2012, filed with the Secretary of State of the State of New York on April 27, 2012 (Incorporated by reference to Exhibit 3(i) 1 of Corning's Form 8-K filed on May 1, 2012).

3 (i)(1) Certificate of Amendment to the Restated Certificate of Incorporation dated January 14, 2014, filed with the Secretary of State of the State of New York on January 14, 2014 (Incorporated by reference to Exhibit 3.1 of Corning's Form 8-K filed on January 15, 2014).

3 (ii) Amended and Restated By-Laws of Corning Incorporated, effective as of December 7, 2015 (Incorporated by reference to Exhibit 3(ii) of Corning's Form 8-K filed December 7, 2015).

4.1 Indenture, dated November 8, 2000, by and between the Company and of The Bank of New York Mellon Trust Company, N.A. (successor to J. P. Morgan Chase & Co., formerly The Chase Manhattan Bank), as trustee (Incorporated by reference to Exhibit 4.01 to Corning's Registration Statement on Form S-3, Registration Statement No. 333-57082). The Company agrees to furnish to the Commission on request copies of other instruments with respect to long-term debt.

4.2 Form of certificate for shares of the common stock (Incorporated by reference to Exhibit 4.4 to Corning's registration statement on Form S-8 dated May 7, 2010 (Registration Statement No. 333-166642)). The terms of the Company's Fixed Rate Cumulative Convertible Preferred Stock, Series A are reflected in the Certificate of Amendment to the Restated Certificate of Incorporation dated January 14, 2014, filed with the Secretary of State of the State of New York on January 14, 2014 and included as Exhibit 3(i)(1) hereto.

4.3 Shareholder Agreement, dated as of October 22, 2013, by and between Samsung Display Co., Ltd. and Corning Incorporated (Incorporated by reference to Exhibit 10.66 to Corning's Form 10-K filed on February 10, 2014, as amended by its Form 10-K/A filed on March 21, 2014).

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4.4 Standstill Agreement, dated as of October 22, 2013, by and among Samsung Electronics Co., Ltd., Samsung Display Co., Ltd. and Corning Incorporated (Incorporated by reference to Exhibit 10.67 to Corning's Form 10-K filed on February 10, 2014, as amended by its Form 10-K/A filed on March 21, 2014).

10.1 2000 Employee Equity Participation Program and 2003 Amendments (Incorporated by reference to Exhibit 1 of Corning Proxy Statement, Definitive 14A filed March 10, 2003 for April 24, 2003 Annual Meeting of Shareholders).

10.2 2003 Variable Compensation Plan (Incorporated by reference to Exhibit 2 of Corning Proxy Statement, Definitive 14A filed March 10, 2003 for April 24, 2003 Annual Meeting of Shareholders).

10.3 2003 Equity Plan for Non-Employee Directors (Incorporated by reference to Exhibit 3 of Corning Proxy Statement, Definitive 14A filed March 10, 2003 for April 24, 2003 Annual Meeting of Shareholders).

10.4 Form of Officer Severance Agreement dated as of February 1, 2004 between Corning Incorporated and each of the following individuals: James P. Clappin, Lawrence D. McRae and David L. Morse (Incorporated by reference to Exhibit 10.1 of Corning's Form 10-Q filed May 4, 2004).

10.5 Form of Amendment dated as of February 1, 2004 to Change In Control Agreement dated as of October 4, 2000 between Corning Incorporated and the following individuals: James P. Clappin, Lawrence D. McRae and David L. Morse (Incorporated by reference to Exhibit 10.4 of Corning's Form 10-Q filed May 4, 2004).

10.6 Form of Change In Control Amendment dated as of October 4, 2000 between Corning Incorporated and the following individuals: James P. Clappin, Lawrence D. McRae and David L. Morse (Incorporated by reference to Exhibit 10.5 of Corning's Form 10-Q filed May 4, 2004).

10.7 Amendment dated as of February 1, 2004 to Change In Control Agreement dated as of April 23, 2002 between Corning Incorporated and Wendell P. Weeks (Incorporated by reference to Exhibit 10.8 of Corning's Form 10-Q filed May 4, 2004).

10.8 Change In Control Agreement dated as of April 23, 2002 between Corning Incorporated and Wendell P. Weeks (Incorporated by reference to Exhibit 10.9 of Corning's Form 10-Q filed May 4, 2004).

10.9 Form of Corning Incorporated Incentive Stock Plan Agreement for Restricted Stock Grants (Incorporated by reference to Exhibit 10.1 of Corning's Form 10-Q filed October 28, 2004).

10.10 Form of Corning Incorporated Incentive Stock Plan Agreement for Restricted Stock Retention Grants (Incorporated by reference to Exhibit 10.2 of Corning's Form 10-Q filed October 28, 2004).

10.11 Form of Corning Incorporated Incentive Stock Option Agreement (Incorporated by reference to Exhibit 10.3 of Corning's Form 10-Q filed October 28, 2004).

10.12 Form of Corning Incorporated Non-Qualified Stock Option Agreement (Incorporated by reference to Exhibit 10.4 of Corning's Form 10-Q filed October 28, 2004).

10.13 2005 Employee Equity Participation Program (Incorporated by reference to Exhibit I of Corning Proxy Statement, Definitive 14A filed March 1, 2005 for April 28, 2005 Annual Meeting of Shareholders).

10.14 2006 Variable Compensation Plan (Incorporated by reference to Appendix J of Corning Proxy Statement, Definitive 14A filed March 8, 2006 for April 27, 2006 Annual Meeting of Shareholders).

10.15 Amended 2003 Equity Plan for Non-Employee Directors (Incorporated by reference to Appendix K of Corning Proxy Statement, Definitive 14A filed March 8, 2006 for April 27, 2006 Annual Meeting of Shareholders).

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10.16 Amended Corning Incorporated 2003 Equity Plan for Non-Employee Directors effective October 4, 2006 (Incorporated by reference to Exhibit 10.28 of Corning's Form 10-K filed February 27, 2007).

10.17 Amended Corning Incorporated 2005 Employee Equity Participation Program effective October 4, 2006 (Incorporated by reference to Exhibit 10.29 of Corning's Form 10-K filed February 27, 2007).

10.18 Form of Corning Incorporated Incentive Stock Plan Agreement for Restricted Stock Grants, amended effective December 6, 2006 (Incorporated by reference to Exhibit 10.30 of Corning's Form 10-K filed February 27, 2007).

10.19 Executive Supplemental Pension Plan effective February 7, 2007 and signed February 12, 2007 (Incorporated by reference to Exhibit 10.31 of Corning's Form 10-K filed February 27, 2007).

10.20 Executive Supplemental Pension Plan as restated and signed April 10, 2007 (Incorporated by reference to Exhibit 10 of Corning's Form 10-Q filed April 27, 2007).

10.21 Amendment No. 1 to 2006 Variable Compensation Plan dated October 3, 2007 (Incorporated by reference to Exhibit 10.34 of Corning's Form 10-K filed February 15, 2008).

10.22 Corning Incorporated Goalsharing Plan dated October 3, 2007 (Incorporated by reference to Exhibit 10.35 of Corning's Form 10-K filed February 15, 2008).

10.23 Corning Incorporated Performance Incentive Plan dated October 3, 2007 (Incorporated by reference to Exhibit 10.36 of Corning's Form 10-K filed February 15, 2008).

10.24 Amendment No. 1 to Deferred Compensation Plan for Directors dated October 3, 2007 (Incorporated by reference to Exhibit 10.37 of Corning's Form 10-K filed February 15, 2008).

10.25 Corning Incorporated Supplemental Pension Plan dated October 3, 2007 (Incorporated by reference to Exhibit 10.38 of Corning's Form 10-K filed February 15, 2008).

10.26 Corning Incorporated Supplemental Investment Plan dated October 3, 2007 (Incorporated by reference to Exhibit 10.39 of Corning's Form 10-K filed February 15, 2008).

10.27 Form of Corning Incorporated Incentive Stock Plan Agreement for Restricted Stock Grants, amended effective December 5, 2007 (Incorporated by reference to Exhibit 10.40 of Corning's Form 10-K filed February 15, 2008).

10.28 Form of Corning Incorporated Non-Qualified Stock Option Agreement, amended effective December 5, 2007 (Incorporated by reference to Exhibit 10.41 of Corning's Form 10-K filed February 15, 2008).

10.29 Amendment No. 2 dated February 13, 2008 and Amendment dated as of February 1, 2004 to Letter of Understanding between Corning Incorporated and Wendell P. Weeks, and Letter of Understanding dated April 23, 2002 between Corning Incorporated and Wendell P. Weeks (Incorporated by reference to Exhibit 10.42 of Corning's Form 10-K filed February 15, 2008).

10.30 Form of Change in Control Agreement Amendment No. 2, effective December 5, 2007 (Incorporated by reference to Exhibit 10.43 of Corning's Form 10-K filed February 15, 2008).

10.31 Form of Officer Severance Agreement Amendment, effective December 5, 2007 (Incorporated by reference to Exhibit 10.44 of Corning's Form 10-K filed February 15, 2008).

10.32 Amendment No. 1 to Corning Incorporated Supplemental Investment Plan, approved December 17, 2007 (Incorporated by reference to Exhibit 10.45 of Corning's Form 10-K filed February 15, 2008).

10.33 Amendment No. 1 to Corning Incorporated Supplemental Pension Plan, approved December 17, 2007 (Incorporated by reference to Exhibit 10.46 of Corning's Form 10-K filed February 15, 2008).

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10.34 Amendment No. 1 to Corning Incorporated Executive Supplemental Pension Plan, approved December 17, 2007 (Incorporated by reference to Exhibit 10.47 of Corning's Form 10-K filed February 15, 2008).

10.35 Second Amended 2005 Employee Equity Participation Program (Incorporated by reference to Exhibit 10 of Corning's Form 8-K filed April 25, 2008).

10.36 Amendment No. 2 to Executive Supplemental Pension Plan effective July 16, 2008 (Incorporated by reference to Exhibit 10 of Corning's Form 10-Q filed July 30, 2008).

10.37 Form of Corning Incorporated Non-Qualified Stock Option Agreement effective as of December 3, 2008 (Incorporated by reference to Exhibit 10.50 of Corning's Form 10-K filed February 24, 2009).

10.38 Form of Corning Incorporated Incentive Stock Right Agreement effective as of December 3, 2008 (Incorporated by reference to Exhibit 10.51 of Corning's Form 10-K filed February 24, 2009).

10.39 Form of Corning Incorporated Incentive Stock Plan Agreement for Restricted Stock Grants effective December 3, 2008 (Incorporated by reference to Exhibit 10.52 of Corning's Form 10-K filed February 24, 2009).

10.40 Form of Change of Control Agreement Amendment No. 3 effective December 19, 2008 (Incorporated by reference to Exhibit 10.53 of Corning's Form 10-K filed February 24, 2009).

10.41 Form of Officer Severance Agreement Amendment No. 2 effective December 19, 2008 (Incorporated by reference to Exhibit 10.54 of Corning's Form 10-K filed February 24, 2009).

10.42 Amendment No. 3 dated December 19, 2008 to Letter of Understanding dated April 23, 2002 between Corning Incorporated and Wendell P. Weeks (Incorporated by reference to Exhibit 10.55 of Corning's Form 10-K filed February 24, 2009).

10.43 Amendment No. 2 to Corning Incorporated Supplemental Investment Plan approved April 29, 2009 (Incorporated by reference to Exhibit 10.1 of Corning's Form 10-Q filed July 29, 2009).

10.44 Amendment No. 2 to Deferred Compensation Plan dated April 29, 2009 (Incorporated by reference to Exhibit 10.2 of Corning's Form 10-Q filed July 29, 2009).

10.45 Amendment No. 2 to 2006 Variable Compensation Plan dated December 2, 2009 (Incorporated by reference to Exhibit 10.58 of Corning's Form 10-K filed February 10, 2010).

10.46 Form of Corning Incorporated Cash Performance Unit Agreement, effective December 2, 2009 (Incorporated by reference to Exhibit 10.59 of Corning's Form 10-K filed February 10, 2010).

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Form of Corning Incorporated Incentive Stock Right Agreement for Time-Based Restricted Stock Units, effective December 2, 2009 (Incorporated by reference to Exhibit 10.60 of Corning's Form 10-K filed February 10, 2010).

10.48 2010 Variable Compensation Plan (Incorporated by reference to Appendix A of Corning's Proxy Statement, Definitive 14A filed March 15, 2010 for April 29, 2010 Annual Meeting of Shareholders).

10.49 2010 Equity Plan for Non-Employee Directors (Incorporated by reference to Appendix B of Corning Proxy Statement, Definitive 14A filed March 15, 2010 for April 29, 2010 Annual Meeting of Shareholders).

10.50 Amendment No. 2 to Corning Incorporated Supplemental Pension Plan dated December 18, 2008 (Incorporated by reference to Exhibit 10.66 of Corning's Form 10-K filed February 10, 2011).

10.51 Form of Corning Incorporated Incentive Stock Right Agreement for Time-Based Incentive Stock Rights, effective January 3, 2011 (Incorporated by reference to Exhibit 10.67 of Corning's Form 10-K filed February 10, 2011).

10.52 Form of Corning Incorporated Cash Performance Unit Agreement, effective January 3, 2011 (Incorporated by reference to Exhibit 10.68 of Corning's Form 10-K filed February 10, 2011).

10.53 Amendment No. 2 to Deferred Compensation Plan for Directors dated February 1, 2012 (Incorporated by reference to Exhibit 10.62 of Corning's Form 10-K filed February 13, 2012).

10.54 Amendment No. 3 to Corning Incorporated Executive Supplemental Pension Plan effective December 31, 2008 (Incorporated by reference to Exhibit 10.59 of Corning's Form 10-K filed February 13, 2013).

10.55 2012 Long-Term Incentive Plan (Incorporated by reference to Appendix A of Corning Proxy Statement, Definitive 14A filed March 13, 2012, for April 26, 2012 Annual Meeting of Shareholders).

10.56 Amendment No. 3 to Deferred Compensation Plan for Directors dated December 28, 2012 (Incorporated by reference to Exhibit 10.61 of Corning's Form 10-K filed February 13, 2013).

10.57 Amendment No. 4 to Corning Incorporated Executive Supplemental Pension Plan effective December 31, 2012 (Incorporated by reference to Exhibit 10.62 of Corning's Form 10-K filed February 13, 2013).

10.58 Form of Corning Incorporated Cash Performance Unit Agreement, effective January 1, 2014 (Incorporated by reference to Exhibit 10.69 to Corning's Form 10-K filed on February 10, 2014, as amended by its Form 10-K/A filed on March 21, 2014).

10.59 Amendment No. 4 to Deferred Compensation Plan for Directors dated September 30, 2014 (Incorporated by reference to Exhibit 10.1 of Corning's Form 10-Q filed on October 29, 2014).

10.61 2014 Variable Compensation Plan (Incorporated by reference to Appendix B of Corning's Proxy Statement, Definitive 14A filed March 13, 2014 for the April 29, 2014 Annual Meeting of Shareholders).

10.62 Form of Corning Incorporated Incentive Stock Rights Agreement, effective January 1, 2015 (Incorporated by reference to Exhibit 10.64 of Corning's Form 10-K filed February 13, 2015).

10.63 Form of Corning Incorporated Cash Performance Unit Agreement, effective January 1, 2015 (Incorporated by reference to Exhibit 10.65 of Corning's Form 10-K filed February 13, 2015).

10.64 Form of Officer Severance Agreement dated as of January 1, 2015 between Corning Incorporated and each of the following individuals: Martin J. Curran; Eric S. Musser; Christine M. Pambianchi; and R. Tony Tripeny (Incorporated by reference to Exhibit 10.1 of Corning's Form 10-Q filed July 30, 2015).

10.65 Form of Change in Control Agreement dated as of January 1, 2015 between Corning Incorporated and each of the following individuals: Martin J. Curran; Eric S. Musser; Christine M. Pambianchi; and R. Tony Tripeny (Incorporated by reference to Exhibit 10.2 of Corning's Form 10-Q filed July 30, 2015).

10.67 Tax Matters Agreement, dated December 10, 2015, by and between Corning Incorporated, The Dow Chemical Company, Dow Corning Corporation and HS Upstate Inc. (Incorporated by reference to Exhibit 1.2 of Corning's Form 8-K filed on December 11, 2015).

10.68 Form of Corning Incorporated Incentive Stock Rights Agreement, effective January 1, 2016 (Incorporated by reference to Exhibit 10.69 of Corning's Form 10-K filed February 12, 2016).

10.69 Form of Corning Incorporated Cash Performance Unit Agreement, effective January 1, 2016 (Incorporated by reference to Exhibit 10.70 of Corning's Form 10-K filed February 12, 2016).

10.71 Form of Corning Incorporated Incentive Stock Rights Agreement for Employees, effective January 1, 2017 (Incorporated by reference to Exhibit 10.71 of Corning's Form 10-K filed February 6, 2017).

10.72 Form of Corning Incorporated Cash Performance Unit Agreement, effective January 1, 2017 (Incorporated by reference to Exhibit 10.72 of Corning's Form 10-K filed February 6, 2017).

10.73	Form of Corning Incorporated Restricted Stock Unit Grant Notice and Agreement for Non-Employee Directors (for grants made under the 2012 Equity Plan for Non-Employee Directors), effective January 1, 2017 (Incorporated by reference to Exhibit 10.73 of Corning's Form 10-K filed February 6, 2017).
10.74	Form of Corning Incorporated Incentive Stock Rights Agreement for Employees, effective January 1, 2018 (Incorporated by reference to Exhibit 10.74 of Corning's Form 10-K filed February 15, 2018).
10.75	Form of Corning Incorporated Cash Performance Unit Agreement, effective January 1, 2018 (Incorporated by reference to Exhibit 10.75 of Corning's Form 10-K filed February 15, 2018).
10.76	Credit Agreement dated as of August 15, 2018, among Corning Incorporated, JPMorgan Chase Bank, N.A., Citibank, N.A., Bank of America, N.A., Goldman Sachs Bank USA, HSBC Bank USA, National Association, Morgan Stanley Bank, N.A., MUFG Bank, Ltd., Standard Chartered Bank, Sumitomo Mitsui Banking Corporation, Wells Fargo Bank, National Association, Bank of China New York Branch, and The Bank of New York Mellon (Incorporated by reference to Exhibit 10.1 to Corning's Form 8-K filed on August 15, 2018).
14	Corning Incorporated Code of Ethics for Chief Executive Officer and Financial Executives, and Code of Conduct for Directors and Executive Officers (Incorporated by reference to Appendix G of Corning Proxy Statement, Definitive 14A filed March 13, 2012 for April 26, 2012 Annual Meeting of Shareholders).
21	Subsidiaries of the Registrant at December 31, 2018.
23	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm.
24	Powers of Attorney (included on the Signatures page of this Annual Report on Form 10-K).
31.1	Certification Pursuant to Rule 13a-15(e) and 15d-15(e), As Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification Pursuant to Rule 13a-15(e) and 15d-15(e), As Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32	Certification Pursuant to 18 U.S.C. Section 1350, As Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Calculation Linkbase Document
101.LAB	XBRL Taxonomy Label Linkbase Document
101.PRE	XBRL Taxonomy Presentation Linkbase Document

101.DEF XBRL Taxonomy Definition Document

Item 16. Form 10-K Summary.

None.

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Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities and Exchange Act of 1934, the Registrant has duly caused his report to be signed on its behalf by the undersigned, thereunto duly authorized.

	Corning Incorporated	
Date: February 12, 2019	By:	/s/ Wendell P. Weeks