ADVANCED ENERGY INDUSTRIES INC
Form 10-K
February 15, 2018
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K

þ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934.
For the fiscal year ended December 31, 2017.
or
o 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: 000-26966
ADVANCED ENERGY INDUSTRIES, INC.
(Exact name of registrant as specified in its charter)

Delaware	84-0846841
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
1625 Sharp Point Drive, Fort Collins, CO	80525
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: (970) 221-4670
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock, $0.001 par value	NASDAQ Global Select Market

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 þ No o
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act: Yes o No þ
Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes þ No o
Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes þ No o
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. o
Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer þ	Accelerated filer o	Non-accelerated filer o (Do not check if a smaller reporting company)	Smaller reporting company o	Emerging growth company o

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. o
Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).
Yes o No þ
The aggregate market value of voting and non-voting common stock held by non-affiliates of the registrant was $2,568,911,641 as of June 30, 2017, based upon the price at which such common stock was last sold on such date.
As of February 13, 2018, there was 39,629,120 shares of the registrant's common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE
Part III of this Annual Report on Form 10-K incorporates information by reference from the registrant’s definitive proxy statement for its 2018 Annual Meeting of Stockholders (to be filed with the Commission under Regulation 14A no later than 120 days after the end of the registrant's fiscal year ended December 31, 2017).

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PART I

Unless the context otherwise requires, as used in this Form 10-K, references to “Advanced Energy”, “the Company”, “we”, “us” or “our” refer to Advanced Energy Industries, Inc. and its consolidated subsidiaries.

ITEM 1. BUSINESS

Overview

Advanced Energy provides highly-engineered, mission-critical, precision power conversion, measurement and control solutions to our global customers. We design, manufacture, sell and support precision power products that transform electrical power into various usable forms. Our power conversion products refine, modify and control the raw electrical power from a utility and convert it into power that is predictable, repeatable and customizable. Our products enable thin film manufacturing processes such as plasma enhanced chemical and physical deposition and etch for various semiconductor and industrial products, industrial thermal applications for material and chemical processes, and specialty power for critical industrial applications. We also supply thermal instrumentation products for advanced temperature measurement and control in these markets. Our network of global service support centers provide local repair and field service capability in key regions as well as provide upgrades and refurbishment services, and sales of used equipment to businesses that use our products.

On July 3, 2017, Advanced Energy acquired all of the issued and outstanding shares of capital stock of Excelsys Holdings Limited (“Excelsys”), an electronics manufacturer in Cork, Ireland. This acquisition is part of Advanced Energy’s strategy to continue to grow and diversify its revenue through organic and inorganic opportunities. The high-efficiency, low voltage, configurable power supplies that Excelsys manufactures for medical and industrial applications will further enhance Advanced Energy’s product portfolio. See Note 2. Business Acquisition in Item 8 "Financial Statements and Supplementary Data."

We incorporated in Colorado in 1981 and reincorporated in Delaware in 1995. Our executive offices are located at 1625 Sharp Point Drive, Fort Collins, Colorado 80525, and our telephone number is 970-407-4670.

Products and Services

Our products are designed to enable new process technologies, improve productivity, and lower the cost of ownership for our customers. We also provide repair and maintenance services for all of our products.

We principally serve original equipment manufacturers ("OEM") and end customers in the semiconductor, flat panel display, high voltage, solar panel, and other industrial capital equipment markets. Our products are used in diverse markets, applications, and processes including the manufacture of capital equipment for semiconductor device manufacturing, thin film applications for thin film renewables and architectural glass, and for other thin film applications including flat panel displays, and industrial coatings. These markets can be cyclical in nature. Therefore, demand for our products and our financial results can change as demand for manufacturing equipment and repair and maintenance services change in response to consumer demand. Other factors, such as global economic and market conditions and technological advances in the applications we serve can also have an impact on our financial results, both positively and negatively.

Our process power systems include direct current ("DC"), pulsed DC, low frequency, high voltage, and radio frequency ("RF") power supplies, matching networks, remote plasma sources for reactive gas applications and RF instrumentation. These power conversion systems refine, modify, and control the raw electrical power from a utility and convert it into power that may be customized and is predictable and repeatable.

Our power control modules and thermal instrumentation products are used in the semiconductor industry, including adjacent thin film applications for solar PV and light emitting diode ("LED") industries, and heavy industries, for thermal control and temperature measurement solutions for applications in which time-temperature cycles affect material properties, productivity, and yield. These products are used in rapid thermal processing, chemical vapor deposition, crystal growing, and other semiconductor and solar applications requiring non-contact temperature measurement. They are also used in chemical processing, glass manufacturing and numerous other general industrial power applications.

Our high voltage products are designed to meet the demanding requirements of OEMs worldwide. Our high voltage power solutions and custom-built power conversion products offer high frequency, high voltage topology, providing wide input and output operating ranges while retaining excellent stability and efficiencies ranging from benchtop and rackmount systems to micro-size printed circuit board mount modules. The products target applications including semiconductor wafer

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processing and metrology, scientific instrumentation, mass spectrometry, industrial printing and analytical x-ray systems for industrial and analytical applications.

Our solutions are designed to meet the demanding requirements of global OEMs in the Industrial, Medical and MIL-COTS (Commercial-off-the-shelf) verticals. Our low voltage products deliver excellence in efficiency, flexibility, performance and reliability. In the Medical industry our solutions are used in a variety of applications including: clinical diagnostic equipment, lasers, X-ray machines, CT-scanners and MRI scanners. In the Industrial vertical our products are commonly used in test and measurement, lasers, optical inspection equipment and scientific instrumentation. We design and manufacture MIL-COTS power supplies that meet the high reliability and often harsh operating environments of the military electronics industry and are ideal for use in a variety of applications including: radar systems, data acquisition, communications equipment, test and measurement equipment.

Our global support services group offers in-warranty and out-of-warranty repair services in the regions in which we operate, providing us with preventive maintenance opportunities. Our customers continue to pursue low cost of ownership of their capital equipment and are increasingly sensitive to the significant costs of system downtime. They expect that suppliers offer comprehensive local repair service and customer support. To meet these market requirements, we maintain a worldwide support organization comprising of both direct and indirect activities through partnership with local distributors primarily in the United States ("U.S."), the People’s Republic of China ("PRC"), Japan, South Korea, Taiwan, Germany, and United Kingdom.

As of December 31, 2015, we discontinued our Inverter production, engineering, and sales product line representing a strategic shift in our business. As such, all Inverter revenues, costs, assets and liabilities are reported in Discontinued Operations for all periods presented herein and we currently report as a single unit. However, extended warranties historically sold and reflected as “Deferred Revenue” on our Consolidated Balance Sheets, represent future revenue and service costs to be incurred by our global services group and are reflected as continuing operations for historical periods and future periods. See Note 3. Discontinued Operations in Item 8 "Financial Statements and Supplementary Data."

Markets

Our products compete in markets for high tech applications using capital equipment. Our markets are not generally subject to seasonality; however, these markets are cyclical due to sudden changes in customers’ manufacturing capacity requirements and spending, which depend in part on capacity utilization, demand for customers’ products, inventory levels relative to demand, government incentives and subsidies, and access to affordable capital. For more information related to the markets in which we compete and the current environment in those markets, see Business Environment and Trends in Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

SEMICONDUCTOR CAPITAL EQUIPMENT

Customers in the semiconductor capital equipment market incorporate our products into equipment that make integrated circuits. Our power conversion systems provide the energy to enable thin film processes, such as deposition and etch, and high voltage applications such as ion implant, wafer inspection and metrology.

Our thermal instrumentation products measure the temperature of the processed substrate or the process chamber. Our power control modules are used in rapid thermal processing applications and for epitaxial growth applications for use in photonics, microelectronics, and photovoltaics. Our remote plasma sources deliver ionized gases for reactive chemical processes used in cleaning, surface treatment, and gas abatement. Precise control over the energy delivered to plasma-based processes enables the production of integrated circuits with reduced feature sizes and increased speed and performance.

INDUSTRIAL POWER

Our industrial power capital market is comprised of products for Thin Films Industrial Power and Specialty Power applications.

- Thin Films Industrial Power applications include glass coating, glass manufacturing, flat panel displays, solar cell manufacturing, and similar thin film manufacturing, including data storage, decorative, hard and optical coating.
- Specialty Power applications include power control modules and thermal instrumentation products for metal fabrication and treatment, and material and chemical processing. Our high voltage industrial applications

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include scanning electron microscopy, medical equipment, and instrumentation applications such as x-ray and mass spectroscopy, as well as general electron gun sources for scientific and industrial applications.

GLOBAL SUPPORT

Our network of global service support centers provides local repair and field service capability in key regions as well as provides upgrades and refurbishment services, and sales of used equipment to businesses that use our products.

Customers

Our products are sold worldwide to approximately 280 OEMs and integrators and directly to more than 1,600 end users. Our ten largest customers accounted for approximately 70.4% of our sales in 2017, 67.7% of our sales in 2016, and 61.2% of our sales in 2015. We expect that the sale of products to our largest customers will continue to account for a significant percentage of our sales for the foreseeable future.

Applied Materials Inc., our largest customer, accounted for 33.5% of our sales in 2017, 35.2% of our sales in 2016, and 29.8% of our sales in 2015. Lam Research accounted for 23.1% of our sales in 2017, 20.7% of our sales in 2016, and 20.3% of our sales in 2015. No other customer accounted for greater than 10% of our sales in 2017, 2016, or 2015. The loss of Applied Materials, Inc. or Lam Research as a customer could have a material adverse effect on our results of operations.

Backlog

Our backlog was approximately $131.3 million at December 31, 2017, an 89.7% increase from $69.2 million at December 31, 2016. This increase resulted primarily due to increased demand in the semiconductor and industrial thin film markets. For more information related to our expectations for the markets we serve, see Business Environment and Trends in Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Backlog orders are firm orders scheduled to be filled and shipped in the next 12 months.

Backlog orders are not necessarily an indicator of future sales levels because of variations in lead times and customer production demand pull systems. Customers may delay delivery of products or cancel orders prior to shipment, subject to possible cancellation penalties. Delays in delivery schedules and/or customer changes to backlog orders during any particular period could cause a decrease in sales and have a material adverse effect on our business and results of operations.

Marketing, Sales and Distribution

We sell our products through direct and indirect sales channels in North America, Europe and Asia. Our sales operations are primarily located in the United States, the PRC, the United Kingdom, Germany, Japan, South Korea, India, Singapore and Taiwan. In addition to a direct sales force, we have independent sales representatives and distributors that support our selling efforts. We maintain customer service offices at many of the locations listed above, as well as other sites near our customers' locations. We believe that customer service and technical support are important competitive factors and are essential to building and maintaining close, long-term relationships with our customers.

The following table presents our net sales by geographic region for the years ended December 31, 2017, 2016, and 2015. Sales are attributed to individual countries based on customer location.

	Years ended December 31,		
Sales to external customers:	2017	2016	2015
United States	$453,095	$327,397	$268,257
Canada	37	161	195
North America	453,132	327,558	268,452
People's Republic of China	34,045	16,207	12,687
Other Asian countries	104,595	77,638	61,839
Asia	138,640	93,845	74,526
Germany	57,351	48,589	46,719
United Kingdom	14,299	13,712	25,100

Other European Countries	7,590	—	14
Europe	79,240	62,301	71,833
Total sales	$671,012	$483,704	$414,811

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Total sales to all countries outside of the U.S. totaled $217.9 million, $156.3 million, and $146.6 million in the years ended December 31, 2017, 2016, and 2015, respectively.

See Item 1A "Risk Factors" for a discussion of certain risks related to our foreign operations.

Manufacturing

The manufacturing of our products is performed in Shenzhen, PRC; Ronkonkoma, New York; Littlehampton, United Kingdom; and Vancouver, Washington. Manufacturing in these locations, primarily the PRC, exposes us to risks, such as exchange controls and currency restrictions, changes in local economic conditions, changes in PRC laws and regulations, government actions, inability to meet customer demands if one of our facilities becomes impaired, and unsettled political conditions.

Manufacturing requires raw materials, including a wide variety of mechanical and electrical components, to be manufactured to our specifications. We use numerous companies, including contract manufacturers, to supply parts for the manufacture and support of our products. Although we make reasonable efforts to assure that parts are available from multiple qualified suppliers, some key parts may be obtained from a sole supplier or a limited group of suppliers. We seek to reduce costs and to lower the risks of production and service interruptions, as well as shortages of key parts by:

- selecting and qualifying alternate suppliers for key parts using rigorous technical and commercial evaluation of suppliers' products and business processes including testing their components' performance, quality, and reliability on our power conversion product at our customers' and their customer's processes. The qualification process for Precision Power, particularly as it pertains to semiconductor customers, follows semiconductor industry standard practices, such as “copy exact”;
- monitoring the financial condition of key suppliers;
- maintaining appropriate inventories of key parts, including making last time purchases of key parts when notified by suppliers that they are ending the supply of those parts;
- qualifying new parts on a timely basis and in geographies that reduce costs without degradation in quality;
- locating certain manufacturing operations in areas that are closer to suppliers and customers; and
- competitively sourcing parts through electronic bidding tools to ensure the lowest total cost is achieved for the parts needed in our products.

Intellectual Property

We seek patent protection for inventions governing new products or technologies as part of our ongoing research and development. We currently hold 121 United States patents and 91 foreign-issued patents, and have 79 patent applications pending in the United States, Europe and Asia. A substantial majority of our patents relate to our Process Power business. Generally, our efforts to obtain international patents have been concentrated in the industrialized countries within Europe and Asia because there are other manufacturers and developers of power conversion and control systems in those countries, as well as customers for those systems for which our intellectual property applies. Litigation may, from time to time, be necessary to enforce patents issued to us, to protect trade secrets or know-how owned by us, to defend us against claimed infringement of the rights of others, or to determine the scope and validity of the proprietary rights of others. See "We are highly dependent on our intellectual property" in Item 1A "Risk Factors."

Competition

The markets we serve are highly competitive and characterized by rapid technological development and changing customer requirements. No single company dominates any of our markets. Significant competitive factors in our markets include product performance, compatibility with adjacent products, price, quality, reliability, and level of customer service and support.

We have seen an increase in global competition in the markets in which we compete, especially from Asian and European-based component suppliers. We encounter substantial competition from foreign and domestic companies for each of our product lines. Some of our competitors have greater financial and other resources than we do. In some cases, competitors are smaller than we are, but are well established in specific product niches. MKS Instruments, Inc., COMET Holding AG., Daihen Corp., TRUMPF Hüttinger GmbH + Co. KG., Comdel, Inc., Kyosan Electric Mfg. Co., Ltd., New Power Plasma Co., Ltd., EN Technologies Inc., Seren IPS, Inc.,and Adtec Plasma Tech. Co., Ltd.

compete with our power conversion products

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for thin film processing. Spellman High Voltage Electronics Corp., Crane Co., and Matsusada Precision, Inc. offer products that compete with our high voltage products. LumaSense Technologies, Inc., CI Systems Ltd., BASF SE., and LayTec AG. offer products that compete with our thermal instrumentation products. Eurotherm, Control Concepts Inc., CD Automation, and Spang Power Electronics offer products that compete with our power control modules. Artesyn Embedded Technologies, Cosel Co., LTD, TKD-Lambda Americas Inc., Mean Well, Vox Power and XP Power compete with our low voltage products.

Additionally, a focus on local content is causing new competitors to emerge around the world, with strong support from local governments, industry leaders, and investors.

Our ability to continue to compete successfully in these markets depends on our ability to make timely introductions of product enhancements and new products, to localize these development and production activities in key world regions, and to produce quality products. We expect our competitors will continue to improve the design and performance of their products, and introduce new products with competitive performance characteristics. We believe that we compete effectively with respect to these factors, although we cannot assure that we will be able to compete effectively in the future.

Research and Development

The market for our precision power conversion, thermal, and high voltage products is characterized by ongoing technological changes. We believe that continued and timely development of new highly differentiated products and enhancements to existing products to support end user and OEM requirements is necessary for us to maintain a competitive position in the markets we serve. Accordingly, we continue to devote a significant portion of our personnel and financial resources to research and development projects and seek to maintain close relationships with our key customers and other industry leaders in order to remain responsive to their product requirements now and in the future.

Research and development expenses were $58.0 million in 2017, $44.4 million in 2016, and $39.6 million in 2015, representing 8.6% of our sales in 2017, 9.2% of our sales in 2016, and 9.5% of our sales in 2015.

Employees

As of December 31, 2017, we had a total of 1,876 employees. Our employees are not represented by unions, except for statutory organization rights applicable to our employees in the PRC and Germany. We believe that our continued success depends, in part, on our ability to attract and retain qualified personnel. We consider our relations with our employees to be good.

Effect of Environmental Laws

We are subject to federal, state, and local environmental laws and regulations, as well as the environmental laws and regulations of the foreign federal and local jurisdictions in which we have manufacturing and service facilities. We believe we are in material compliance with all such laws and regulations.

Compliance with federal, state, and local laws and regulations has not had, and is not expected to have, an adverse effect on our capital expenditures, competitive position, financial condition, or results of operations.

Website Access

Our website address is www.advanced-energy.com. We make available, free of charge on our website, our Annual Report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and all amendments to these reports as soon as reasonably practicable after filing such reports with, or furnishing them to, the Securities and Exchange Commission (“SEC”). Such reports are also available at www.sec.gov. Information contained on our website is not incorporated by reference in, or otherwise part of, this Annual Report on Form 10-K nor any of our other filings with the SEC.

Special Note Regarding Forward-Looking Statements

This Annual Report on Form 10-K includes or incorporates by reference “forward-looking statements” within the meanings of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. All statements contained or incorporated by reference in this Annual Report on Form 10-K, other than statements of historical fact, are “forward-looking statements.” For example, statements relating to our beliefs, expectations, plans, projections, forecasts, goals, and estimates are forward-looking statements, as are statements that specified actions, conditions, or circumstances will continue or change. Forward-looking statements involve risks and uncertainties. In some cases, forward-looking statements can be identified by the inclusion of words such as "believe," "expect," "plan," "anticipate," "estimate," "may," "might," "could," "should," "will," "continue," "intend," "goal," and similar words.

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Some of the forward-looking statements in this Annual Report on Form 10-K are, or reflect, our expectations or projections relating to:

- our future revenues;
- our future sales, including backlog orders;
- our ability to be successful in the design win process with our OEM customers;
- unanticipated costs in fulfilling our warranty obligations for solar inverters;
- our future gross profit;
- our competition;
- market acceptance of, and demand for, our products;
- the fair value of our assets and financial instruments;
- research and development expenses;
- selling, general, and administrative expenses;
- sufficiency and availability of capital resources;
- capital expenditures;
- our share repurchase program;
- our tax assets and liabilities;
- our other commitments and contingent liabilities;
- adequacy of our reserve for excess and obsolete inventory;
- adequacy of our warranty reserves;
- restructuring activities and expenses;
- the integration of our acquisitions;
- general global political and economic conditions; and
- industry trends.

Our actual results could differ materially from those projected or assumed in our forward-looking statements because forward-looking statements by their nature are subject to risks and uncertainties. Factors that could contribute to these differences or prove our forward-looking statements, by hindsight, to be overly optimistic or unachievable include the factors described in Item 1A “Risk Factors.” Other factors might also contribute to the differences between our forward-looking statements and our actual results. We assume no obligation to update any forward-looking statement or the reasons why our actual results might differ.

Executive Officers of the Registrant

Our executive officers, their positions and their ages as of December 31, 2017 were as follows:

Yuval Wasserman, 63, has served as President & Chief Executive Officer, and as a director since October 2014. Mr. Wasserman joined us in August 2007 as Senior Vice President, Sales, Marketing and Service. In October 2007, Mr. Wasserman was promoted to Executive Vice President, Sales, Marketing and Service. In April 2009, he was promoted to Executive Vice President and Chief Operating Officer of the Company, and then in August 2011, he was promoted to President of the Thin Films Business Unit. Prior to joining the Company, Mr. Wasserman served as the President, and later as Chief Executive Officer, of Tevet Process Control Technologies, Inc., a semiconductor metrology company, until July 2007. Prior to that, he held senior executive and general management positions at Boxer Cross (a metrology company acquired by Applied Materials, Inc.), Fusion Systems (a plasma strip company that is a division of Axcelis Technologies, Inc.), and AG Associates (a semiconductor capital equipment company focused on rapid thermal processing). Mr. Wasserman started his career at National Semiconductor, Inc., where he held various process engineering and management positions. Mr. Wasserman was on the Board of Directors of Syncroness, Inc., an outsourced engineering and product development company, from 2010 to 2017 when it was sold, and joined the Board of Directors of FARO Technologies, Inc., a publicly traded, manufacturer of three-dimensional (3D) measurement, imaging and realization systems,in December 2017. Mr. Wasserman is a National Association of Corporate Directors (NACD) Governance Fellow. Mr. Wasserman has a BSc degree in chemical engineering from BenGurion University in Israel.

Thomas Liguori, 59, was our Executive Vice President and Chief Financial Officer from May 2015 until his resignation on January 26, 2018. Prior to joining Advanced Energy, he served as Executive Vice President and Chief Financial Officer at Multi-Fineline Electronix, Inc. since 2008. Multi-Fineline Electronix, Inc. is one of the world's largest producers of flexible printed circuits and flexible circuit assemblies. Prior to Multi-Fineline Electronix, Inc., Mr. Liguori served as Chief Financial Officer at Hypercom, Inc. from November 2005 to February 2008, where he designed and built the global finance and administration functions. From February 2005 to November 2005, Mr. Liguori served as Vice President, Finance and Chief Financial Officer at Iomega Corporation, a publicly traded provider of storage and network security solutions, and from April 2000 to February 2005, as Chief Financial Officer at Channell Commercial Corporation, a publicly traded designer and manufacturer of telecommunications equipment. Prior to that time, Mr. Liguori served as Chief Financial Officer of Dole Europe for Dole Food Company, serving as the top-ranking financial and IT executive in Dole's operations in Europe, Africa and the Middle East, and as Vice President of Finance at Teledyne Technologies International Corp. Mr. Liguori began his career with Honeywell Ltd. and served as a management consultant with Deloitte & Touche LLP. Mr. Liguori holds a Bachelor's in Business Administration from Boston University and completed a M.B.A. in Finance, from Arizona State University. He is a Certified Management Accountant and a Certified Financial Manager. Mr. Liguori is a National Association of Corporate Directors (NACD) Board Leadership Fellow.

Thomas O. McGimpsey, 56, joined us in April 2009 as Vice President and General Counsel and was promoted to Executive Vice President of Corporate Development (M&A) and General Counsel in August 2011, and held the corporate development executive position until mid-2015. In January 2018, Mr. McGimpsey was appointed as the Interim Chief Financial Officer and now has the combined role of Executive Vice President, Chief Financial Officer & General Counsel. Mr. McGimpsey also managed Advanced Energy's IT Department from 2010 to 2013. Prior to joining the Company, from February 2008 to April 2009, Mr. McGimpsey held the position of Vice President of Operations at First Data Corporation. During 2007, Mr. McGimpsey was a consultant and legal advisor to various companies. From July 2000 to January 2007, Mr. McGimpsey held various positions with McDATA Corporation such as Executive Vice President of Business Development & Chief Legal Officer, Senior Vice President & General Counsel and Vice President of Corporate Development. From February 1998 until its sale in June 2000, Mr. McGimpsey held the position of Director and Senior Corporate Attorney at US WEST, Inc. From 1991 to 1998, Mr. McGimpsey was in private practice at national law firms. From 1984 to 1988, Mr. McGimpsey was a Senior Engineer for Software Technology, Inc. Mr. McGimpsey has been on the Board of Directors of CPP, Inc., an international engineering services company since August 2015 and has been a Commissioner to the Colorado Commission on Higher Education since July 2015. Mr. McGimpsey received his Executive M.B.A. (with honors) from Colorado State University, his Juris Doctor degree from the University of Colorado and his B.S. degree in Computer Science (with a minor in electrical systems) from Embry-Riddle Aeronautical University. Mr. McGimpsey is a National Association of Corporate Directors (NACD) Board Leadership Fellow.

ITEM 1A. RISK FACTORS

Our business, financial condition, operating results and cash flows can be impacted by a number of factors, including, but not limited to, those set forth below, any of which could cause our results to be adversely impacted and could result in a decline in the value or loss of an investment in our common stock. Other factors may also exist that we cannot anticipate or that we currently do not consider to be significant based on information that is currently available. These risks and uncertainties have the potential to materially affect our business, financial condition, results of operations, cash flows and future results. Such risks and uncertainties may also impact the accuracy of forward-looking statements included in this Form 10-K and other reports we file with the Securities and Exchange Commission. Investors should carefully consider information in this Annual Report on Form 10-K in light of the risk factors described below.

We conduct manufacturing at only a few sites and our sites are not generally interchangeable.

Our power products for the semiconductor industry are manufactured in Shenzhen, PRC. Our high voltage products are manufactured in Ronkonkoma, New York, Littlehampton, United Kingdom and Shenzhen, PRC. Our thermal instrumentation products that are used in the semiconductor industry are manufactured in Vancouver, Washington and Littlehampton, United Kingdom. Each facility is under operating lease and interruptions in operations could be caused by early termination of existing leases by landlords or failure by landlords to renew existing leases upon expiration, including

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the possibility that suitable operating locations may not be available in proximity to existing facilities which could result in labor or supply chain risks. Each facility manufactures different products, and therefore, is not interchangeable. Natural, uncontrollable occurrences or other operational issues at any of our manufacturing facilities could significantly reduce our productivity at such site and could prevent us from meeting our customers' requirements in a timely manner, or at all. In particular, for certain higher demand products manufactured out of our Littlehampton, United Kingdom site, we are experiencing longer delivery times and delayed shipments to customers which may continue over the short term. Any potential losses from such occurrences could significantly affect our relationship with customers, operations and results of operations for a prolonged period of time.

Our restructuring and other cost reduction efforts in prior years have included transitioning manufacturing operations to our facility in Shenzhen from other manufacturing facilities, such as Fort Collins, Colorado and Littlehampton, United Kingdom, which renders us increasingly reliant upon our Shenzhen facility. We have been notified that we will be required to relocate our Shenzhen, PRC manufacturing facility by July 2020. A disruption in manufacturing at our Shenzhen facility, from whatever cause, could have a significantly adverse effect on our ability to fulfill customer orders, our ability to maintain customer relationships, our costs to manufacture our products and, as a result, our results of operations and financial condition.

Our evolving manufacturing footprint may increase our risk.

The nature of our manufacturing is evolving as we continue to grow by acquisition. Historically, our principal manufacturing location has been in Shenzhen, PRC; however, we have also added specialized manufacturing at our Littlehampton, United Kingdom, and Ronkonkoma, New York facilities. From time to time we may be required to relocate manufacturing or migrate manufacturing of specific products between facilities or to third party manufacturers. We have been notified that we will be required to relocate our Shenzhen, PRC manufacturing facility by July 2020. If we do not successfully coordinate the timely manufacturing and distribution of our products during this time, we may have insufficient supply of products to meet customer demand, we could lose sales, we may experience a build-up in inventory, or we may incur additional costs.

Raw material, part, component, and subassembly shortages, exacerbated by our dependence on sole and limited source suppliers, could affect our ability to manufacture products and systems and could delay our shipments.

Our business depends on our ability to manufacture products that meet the rapidly changing demands of our customers. Our ability to timely manufacture our products depends in part on the timely delivery of raw materials, parts, components, and subassemblies from suppliers. We rely on sole and limited source suppliers for some of our raw materials, parts, components, and subassemblies that are critical to the manufacturing of our products.

This reliance involves several risks, including the following:

- the inability to obtain an adequate supply of required parts, components, or subassemblies;
- supply shortages, if a sole or limited source provider ceases operations;
- the need to fund the operating losses of a sole or limited source provider;
- reduced control over pricing and timing of delivery of raw materials and parts, components, or subassemblies;
- the need to qualify alternative suppliers;
- suppliers that may provide parts, components or subassemblies that are defective, contain counterfeit goods or are otherwise misrepresented to us in terms of form, fit or function; and
- the inability of our suppliers to develop technologically advanced products to support our growth and development of new products.

From time to time, our sole or limited source suppliers have given us notice that they are ending supply of critical parts, components, and subassemblies that are required for us to deliver product. If we cannot qualify alternative suppliers before ending supply of critical parts from the sole or limited source suppliers, we may be required to make a last-time-buy(s) and take possession of material amounts of inventory in advance of customer demand. In some instances, the last-time-buy materials required to be purchased may be for several years which in turn exposes us to additional excess and obsolescence risk. If we cannot qualify alternative suppliers before the last-time-buy materials are utilized in our products or legacy inverter warranty operations, we may be unable to deliver further product or legacy inverter warranty service to our customers.

Qualifying alternative suppliers could be time consuming and lead to delays in, or prevention of delivery of products to our customers, as well as increased costs. If we are unable to qualify additional suppliers and manage relationships with our existing and future suppliers successfully, if our suppliers experience financial difficulties including bankruptcy, or if our suppliers cannot meet our performance or quality specifications or timing requirements, we may experience shortages, delays, or increased costs of raw materials, parts, components, or subassemblies. This in turn could limit or prevent our ability to manufacture and ship our products, which could materially and adversely affect our relationships with our current and prospective customers and our business, financial condition, and results of operations.

Our orders of raw materials, parts, components, and subassemblies are based on demand forecasts.

We place orders with many of our suppliers based on our customers' quarterly forecasts and our annual forecasts. These forecasts are based on our customers' and our expectations as to demand for our products. As the quarter and the year progress, such demand can change rapidly or we may realize that our customers' expectations were overly optimistic or pessimistic, especially when industry or general economic conditions change. Orders with our suppliers cannot always be amended in response. In addition, in order to assure availability of certain components or to obtain priority pricing, we have entered into contracts with some of our suppliers that require us to purchase a specified amount of components and subassemblies each quarter, even if we are not able to use such components or subassemblies. Moreover, we have obligations to some of our customers to hold a minimum amount of finished goods in inventory, in order to fulfill just in time orders, regardless of whether the customers expect to place such orders. We currently have firm purchase commitments and agreements with various suppliers to ensure the availability of components. If demand for our products does not continue at current levels, we might not be able to use all of the components that we are required to purchase under these commitments and agreements, and our reserves for excess and obsolete inventory may increase, which could have a material adverse effect on our results of operations. If demand for our products exceeds our customers' and our forecasts, we may not be able to timely obtain sufficient raw materials, parts, components, or subassemblies, on favorable terms or at all, to fulfill the excess demand.

Newly enacted U.S. government tax reform could have a negative impact on the results of future operations.

On December 22, 2017, the U.S. Tax Cuts and Jobs Act (the "Tax Act") was enacted which contained substantial changes to the Internal Revenue Code, some of which could have an adverse effect on our business. The Tax Act significantly revises the U.S. corporate income tax by, among other things, lowering corporate income tax rates, implementing the territorial tax system and imposing a transition tax on deemed repatriated earnings of our foreign subsidiaries. With the enactment of the Tax Act, our financial results for 2017 included a mandatory one-time estimated income tax expense of approximately $72.9 million resulting from the transition tax and the revaluation of our U.S. deferred tax assets and liabilities to reflect the recently enacted 21% federal corporate tax rate effective January 1, 2018. These estimates are based on our initial analysis of the Tax Act. Given the significant complexity of the Tax Act, anticipated guidance from the Internal Revenue Service about implementing the Tax Act, and the potential for additional guidance from the Securities and Exchange Commission or the Financial Accounting Standards Board related to the Tax Act, these estimates may be adjusted in future periods during 2018.

Significant developments stemming from recent U.S. government proposals concerning tariffs and other economic proposals could have a material adverse effect on us.

Recent U.S. government proposals could impose greater restrictions and economic disincentives on international trade, particularly imports.

Proposals to date include possible tariffs on goods imported into the United States, particularly from China, that could increase the cost of imported products. We have our primary manufacturing facility in Shenzhen, PRC and a significant portion of our products are imported into the United States. Any increase in the cost of our goods imported into the United States could adversely impact our competitiveness. Depending on the final regulation, we may elect to move some of our manufacturing operations to the US which could increase our costs as well. While the final changes in regulation are not known at this time, any final regulation that adds a cost to imported product could have a material effect on our costs and net income.

Changes in U.S. social, political, regulatory and economic conditions or in laws and policies governing foreign trade, manufacturing, development and investment in the territories and countries where we currently develop and sell products, and any negative sentiments towards the United States as a result of such changes, could adversely affect our business. In addition, negative sentiments towards the United States among non-U.S. customers and among non-U.S. employees or prospective employees could adversely affect sales or hiring and retention, respectively.

Increased governmental action on income tax regulations could negatively impact our business.

International governments have heightened their review and scrutiny of multinational businesses like ours which could increase our compliance costs and future tax liability to those governments. As governments continue to look for ways to increase their revenue streams they could increase audits of companies to accelerate the recovery of monies perceived as owed to them under current or past regulations. Such an increase in audit activity could have a negative impact on companies which operate internationally, as we do.

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Activities necessary to integrate acquisitions may result in costs in excess of current expectations or be less successful than anticipated.

We have completed acquisitions in the past and we may acquire other businesses in the future. The success of such transactions will depend on, among other things, our ability to integrate assets and personnel acquired in these transactions and to apply our internal controls process to these acquired businesses. The integration of acquisitions may require significant attention from our management, and the diversion of management's attention and resources could have a material adverse effect on our ability to manage our business. Furthermore, we may not realize the degree or timing of benefits we anticipated when we first entered into the acquisition transaction. If actual integration costs are higher than amounts originally anticipated, if we are unable to integrate the assets and personnel acquired in an acquisition as anticipated, or if we are unable to fully benefit from anticipated synergies, our business, financial condition, results of operations, and cash flows could be materially adversely affected.

We have historically made acquisitions and divestitures. However, we may not find suitable acquisition candidates in the future and we may not be able to successfully integrate and manage acquired businesses. In either an acquisition or a divestiture, we may be required to make fundamental changes in our ERP, business processes and tools which could disrupt our core business and harm our financial condition.

In the past, we have made strategic acquisitions of other corporations and entities, as well as asset purchases, and we continue to evaluate potential strategic acquisitions of complementary companies, products, and technologies. We have also divested businesses. In the future, we could:

- issue stock that would dilute our current stockholders' percentage ownership;
- pay cash that would decrease our working capital;
- incur debt;
- assume liabilities; or
- incur expenses related to impairment of goodwill and amortization.

Acquisitions and divestitures also involve numerous risks, including:

- problems combining or separating the acquired/divested operations, systems, technologies, or products;
- an inability to realize expected sales forecasts, operating efficiencies or product integration benefits;
- difficulties in coordinating and integrating geographically separated personnel, organizations, systems, and facilities;
- difficulties integrating business cultures;
- unanticipated costs or liabilities;
- diversion of management's attention from our core business;
- adverse effects on existing business relationships with suppliers and customers;
- potential loss of key employees, particularly those of purchased organizations;
- incurring unforeseen obligations or liabilities in connection with either acquisitions or divestitures; and
- the failure to complete acquisitions even after signing definitive agreements which, among other things, would result in the expensing of potentially significant professional fees and other charges in the period in which the acquisition or negotiations are terminated.

We may not be able to successfully identify appropriate acquisition candidates, to integrate any businesses, products, technologies, or personnel that we might acquire in the future or achieve the anticipated benefits of such transactions, which may harm our business.

Our operations in the People's Republic of China are subject to significant political and economic uncertainties over which we have little or no control and we may be unable to alter our business practice in time to avoid reductions in revenues.

A significant portion of our operations outside the United States are located in the PRC, which exposes us to risks, such as exchange controls and currency restrictions, changes in local economic conditions, changes in customs regulations, changes in tax policies, changes in PRC laws and regulations, possible expropriation or other PRC government actions, and unsettled political conditions including potential changes in U.S. policy regarding overseas manufacturing. These factors may have a material adverse effect on our operations, business, results of operations, and financial condition. See "We are exposed to risks associated with worldwide financial markets and the global economy" risk factor below.

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The PRC's economy differs from the economies of most developed countries in many respects, including with respect to the amount of government involvement, level of development, rate of growth, control of foreign exchange and allocation of resources. While the economy of the PRC has experienced significant growth in the past 20 years, growth has been uneven across different regions and amongst various economic sectors of the PRC. The PRC government has implemented various measures to encourage economic development and guide the allocation of resources. Strikes by workers and picketing in front of the factory gates of certain companies in Shenzhen have caused unrest among some workers seeking higher wages, which could impact our manufacturing facility in Shenzhen. While some of the government's measures may benefit the overall economy of the PRC, they may have a negative effect on us. For example, our financial condition and results of operations may be materially and adversely affected by government control over capital investments or changes in tax regulations that are applicable to us as well as work stoppages.

Changes in tax laws, tax rates, or mix of earnings in tax jurisdictions in which we do business, could impact our future tax liabilities and related corporate profitability

We are subject to income taxes in the U.S. (federal and state) and numerous foreign jurisdictions. Tax laws, regulations, and administrative practices in various jurisdictions may be subject to significant change due to economic, political, and other conditions, and significant judgment is required in evaluating and estimating our provision and accruals for these taxes. There are many transactions that occur during the ordinary course of business for which the ultimate tax determination is uncertain. Our effective tax rates could be adversely affected by earnings being lower than anticipated in jurisdictions where we have lower statutory rates and earnings higher than anticipated in jurisdictions where we have higher statutory rates, losses incurred in jurisdictions for which we are not able to realize the related tax benefit, changes in foreign currency exchange rates, entry into new businesses and geographies and changes to our existing businesses, acquisitions (including integrations) and investments, changes in our deferred tax assets and liabilities and their valuation, and changes in the relevant tax, accounting, and other laws, regulations, administrative practices, principles, and interpretations, including fundamental changes to the tax laws applicable to corporate multinationals. The U.S., many countries in the European Union, and a number of other countries are actively considering changes in this regard.

For example, on October 5, 2015, the Organisation for Economic Co-operation and Development (OECD) issued the final report on all 15 Base Erosion and Profit Shifting "BEPS" Action Plans. According to the OECD, the current rules have created opportunities for Base Erosion and Profit Shifting and suggest new rules whereby profits are taxed where economic activities take place and value is created. OECD comments include new or reinforced international standards as well as concrete measures to help countries tackle BEPS. Among the highlights of the OECD Final Reports are the new transfer pricing approach and reinforced international standards on tax treaties, the setting of minimum standards on harmful tax practices, treaty abuse, country-by-country reporting and dispute resolution, action items requiring national legislation particularly in hybrid mismatches and interest restriction, and analytical reports with recommendations concerning digital economy and multilateral instruments. If countries in which we operate adopt the OECD recommendations as outlined in the BEPS Action Plans, it is uncertain to what extent the changes could impact the Company.

We are exposed to risks associated with worldwide financial markets and the global economy.

Our business depends on the expansion of manufacturing capacity in our end markets and the installation base for the products we sell. In the past, severe tightening of credit markets, turmoil in the financial markets, and a weakening global economy have contributed to slowdowns in the industries in which we operate. Some of our key markets depend largely on consumer spending. Economic uncertainty, such as that recently experienced in the PRC, exacerbates negative trends in consumer spending and may cause our customers to push out, cancel, or refrain from placing orders.

Difficulties in obtaining capital and uncertain market conditions may also lead to a reduction of our sales and greater instances of nonpayment. These conditions may similarly affect our key suppliers, which could affect their ability to deliver parts and result in delays for our products. Further, these conditions and uncertainty about future economic conditions could make it challenging for us to forecast our operating results and evaluate the risks that may affect our business, financial condition, and results of operations. As discussed in "Our orders of raw materials, parts, components, and subassemblies are based on demand forecasts," a significant percentage of our expenses are relatively fixed and based, in part, on expectations of future net sales. If a sudden decrease in demand for our products from one or more customers were to occur, the inability to adjust spending quickly enough to compensate for any shortfall would magnify the adverse impact of a shortfall in net sales on our results of operations. Conversely, if market conditions were to unexpectedly improve and demand for our products were to increase suddenly, we might not be able to respond quickly enough, which could have a negative impact on our results of operations and customer relations.

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Our results of operations could be affected by natural disasters and other events in the locations in which we or our customers or suppliers operate.

We have manufacturing and other operations in locations subject to natural occurrences such as severe weather and geological events including earthquakes or tsunamis that could disrupt operations. In addition, our suppliers and customers also have operations in such locations. A natural disaster, fire, explosion, or other event that results in a prolonged disruption to our operations, or the operations of our customers or suppliers, may materially adversely affect our business, results of operations, or financial condition.

We transitioned a significant amount of our supply base to Asian suppliers.

We transitioned the purchasing of a substantial portion of components for our thin film products to Asian suppliers to lower our materials costs and shipping expenses. These components might require us to incur higher than anticipated testing or repair costs, which would have an adverse effect on our operating results. Customers who have strict and extensive qualification requirements might not accept our products if these lower-cost components do not meet their requirements. A delay or refusal by our customers to accept such products, as well as an inability of our suppliers to meet our purchasing requirements, might require us to purchase higher-priced components from our existing suppliers or might cause us to lose sales to these customers, either of which could lead to decreased revenue and gross margins and have an adverse effect on our results of operations.

The industries in which we compete are subject to volatile and unpredictable cycles.

As a supplier to the global semiconductor, flat panel display, solar, industrial and related industries, we are subject to business cycles, the timing, length, and volatility of which can be difficult to predict. These industries historically have been cyclical due to sudden changes in customers' manufacturing capacity requirements and spending, which depend in part on capacity utilization, demand for customers' products, inventory levels relative to demand, and access to affordable capital. These changes have affected the timing and amounts of customers' purchases and investments in technology, and continue to affect our orders, net sales, operating expenses, and net income. In addition, we may not be able to respond adequately or quickly to the declines in demand by reducing our costs. We may be required to record significant reserves for excess and obsolete inventory as demand for our products changes.

To meet rapidly changing demand in each of the industries we serve, we must effectively manage our resources and production capacity. During periods of decreasing demand for our products, we must be able to appropriately align our cost structure with prevailing market conditions, effectively manage our supply chain, and motivate and retain key employees. During periods of increasing demand, we must have sufficient manufacturing capacity and inventory to fulfill customer orders, effectively manage our supply chain, and attract, retain, and motivate a sufficient number of qualified individuals. If we are not able to timely and appropriately adapt to changes in our business environment or to accurately assess where we are positioned within a business cycle, our business, financial condition, or results of operations may be materially and adversely affected.

We must continually design and introduce new products into the markets we serve to respond to competition and rapid technological changes.

We operate in a highly competitive environment where innovation is critical, our future success depends on many factors, including the effective commercialization and customer acceptance of our products and services. The development, introduction and support of a broadening set of products is critical to our continued success. Our results of operations could be adversely affected if we do not continue to develop new products, improve and develop new applications for existing products, and differentiate our products from those of competitors resulting in their adoption by customers.

We must achieve design wins to retain our existing customers and to obtain new customers, although design wins achieved do not necessarily result in substantial sales.

Driven by continuing technology migration and changing customers demand the markets we serve are constantly changing in terms of advancement in applications, core technology and competitive pressures. New products we design for capital equipment manufacturers typically have a lifespan of five to ten years. Our success and future growth depends on our products being designed into our customers new generations of equipment as they develop new technologies and applications. We must work with these manufacturers early in their design cycles to modify, enhance and upgrade our products or design new products that meet the requirements of their new systems. The design win process is highly competitive and we may win or lose new design wins for our existing customers or new customers next generations of equipment. In case existing or new customers do not choose our products as a result of the development, evaluation and qualification efforts related to the design

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win process, our market share will be reduced, the potential revenues related to the lifespan of our customers' products, which can be 5-10 years, will not be realized, and our business, financial condition and results of operations would be materially and adversely impacted.

We generally have no long-term contracts with our customers requiring them to purchase any specified quantities from us.

Our sales are primarily made on a purchase order basis, and we generally have no long-term purchase commitments from our customers, which is typical in the industries we serve. As a result, we are limited in our ability to predict the level of future sales or commitments from our current customers, which may diminish our ability to allocate labor, materials, and equipment in the manufacturing process effectively. In addition, we may purchase inventory in anticipation of sales that do not materialize, resulting in excess and obsolete inventory write-offs.

If we are unable to adjust our business strategy successfully for some of our product lines to reflect the increasing price sensitivity on the part of our customers, our business and financial condition could be harmed.

Our business strategy for many of our product lines has been focused on product performance and technology innovation to provide enhanced efficiencies and productivity. As a result of recent economic conditions and changes in various markets that we serve, our customers have experienced significant cost pressures. We have observed increased price sensitivity on the part of our customers. If competition against any of our product lines should come to focus solely on price rather than on product performance and technology innovation, we will need to adjust our business strategy and product offerings accordingly, and if we are unable to do so, our business, financial condition, and results of operations could be materially and adversely affected.

Our competitive position could be weakened if we are unable to convince end users to specify that our products be used in the equipment sold by our customers.

The end users in our markets may direct equipment manufacturers to use a specified supplier’s product in their equipment at a particular facility. This occurs with frequency because our products are critical in manufacturing process control for thin-film applications. Our success, therefore, depends in part on our ability to have end users specify that our products be used at their facilities. In addition, we may encounter difficulties in changing established relationships of competitors that already have a large installed base of products within such facilities.

The markets we operate in are highly competitive.

We face substantial competition, primarily from established companies, some of which have greater financial, marketing, and technical resources than we do. We expect our competitors will continue to develop new products in direct competition with ours, improve the design and performance of their products, and introduce new products with enhanced performance characteristics. In order to remain competitive, we must improve and expand our products and product offerings. In addition, we may need to maintain a high level of investment in research and development and expand our sales and marketing efforts, particularly outside of the United States. We might not be able to make the technological advances and investments necessary to remain competitive. If we were unable to improve and expand our products and product offerings, our business, financial condition, and results of operations could be materially and adversely affected.

A significant portion of our sales and accounts receivable are concentrated among a few customers.

Our ten largest customers accounted for 70.4%, 67.7% and 61.2% of our sales for the years ended December 31, 2017, 2016 and 2015, respectively. During the year ended December 31, 2017, sales to Applied Materials, Inc. and Lam Research were $224.8 million and $155.3 million or 33.5% and 23.1%, respectively, and accounts receivable were $36.8 million and $5.4 million , respectively. During the year ended December 31, 2016, sales to Applied Materials, Inc., and Lam Research were $170.2 million and $100.3 million, or 35.2% and 20.7%, respectively, and accounts receivable were $31.1 million and $14.3 million, respectively. During the year ended December 31, 2015, sales to Applied Materials, Inc. and Lam Research were $123.5 million and $84.2 million, or 29.8% and 20.3%, respectively, and accounts receivable were $17.1 million and $7.3 million, respectively. A significant decline in sales from either or both of these customers, or the Company's inability to collect on these sales, could materially and adversely impact our business, results of operations and financial condition.

We maintain significant amounts of cash in international locations.

Given the global nature of our business, we have both domestic and international concentrations of cash and investments. The value of our cash, cash equivalents, and marketable securities can be negatively affected by liquidity, credit deterioration, financial results, economic risk, political risk, sovereign risk or other factors. The Company intends to utilize its foreign cash to expand our international operations through internal growth and strategic acquisitions. If our intent changes or if these funds are needed for our U.S. operations, or we are negatively impacted by any of the factors above, our financial condition and results of operations could be materially adversely affected.

We are subject to risks inherent in international operations.

Sales to our customers outside the United States were approximately 32.5% and 32.3% of our total sales for the years ended December 31, 2017 and 2016. The acquisitions of the power controls modules and high and low voltage product lines have increased our presence in international locations. Our success producing goods internationally and competing in international markets is subject to our ability to manage various risks and difficulties, including, but not limited to:

- our ability to effectively manage our employees at remote locations who are operating in different business environments from the United States;
- our ability to develop and maintain relationships with suppliers and other local businesses;
- compliance with product safety requirements and standards that are different from those of the United States;
- variations and changes in laws applicable to our operations in different jurisdictions, including enforceability of intellectual property and contract rights;
- trade restrictions, political instability, disruptions in financial markets, and deterioration of economic conditions;
- customs regulations and the import and export of goods (including customs audits in various countries that occur from time to time);
- the ability to provide sufficient levels of technical support in different locations;
- our ability to obtain business licenses that may be needed in international locations to support expanded operations;
- timely collecting accounts receivable from foreign customers including $21.4 million in accounts receivable from foreign customers as of December 31, 2017; and
- changes in tariffs, taxes, and foreign currency exchange rates.

Our profitability and ability to implement our business strategies, maintain market share and compete successfully in international markets will be compromised if we are unable to manage these and other international risks successfully.

Globalization of sales increases risk of compliance with policy.

We operate in an increasingly complex sales environment around the world which places greater importance on our global control environment and imposes additional oversight risk. Such increased complexity could adversely affect our operating results by increasing compliance costs in the near-term and by increasing the risk of control failures in the event of non-compliance.

Market pressures and increased low-cost competition may reduce or eliminate our profitability.

Our customers continually exert pressure on us to reduce our prices and extend payment terms. Given the nature of our customer base and the highly competitive markets in which we compete, we may be required to reduce our prices or extend payment terms to remain competitive. We have recently seen pricing pressure from our largest customers due in part to low-cost competition and market consolidation. As a result of the competitive markets we serve, from time to time we may enter into long term pricing agreements with our largest customers that results in reduced product pricing. Such reduced product pricing may result in product margin declines unless we are successful in reducing our product costs ahead of such price reductions. We believe some of our Asian competitors benefit from local governmental funding incentives and purchasing preferences from end-user customers in their respective countries. Moreover, in order to be successful in the current competitive environment, we are required to accelerate our investment in research & development to meet time-to-market, performance and technology adoption cycle needs of our customers simply in order to compete for design wins, and if successful, receive potential purchase orders. Given such up-front investments we have to make and the competitive nature of our markets, we may not be able to reduce our expenses in an amount sufficient to offset potential margin declines or loss of business and may not be able to meet customer product time-line expectations. The potential decrease in cash flow could materially and adversely impact our financial condition.

We are highly dependent on our intellectual property.

Our success depends significantly on our proprietary technology. We attempt to protect our intellectual property rights through patents and non-disclosure agreements; however, we might not be able to protect our technology, and competitors might be able to develop similar technology independently. In addition, the laws of some foreign countries might not afford our intellectual property the same protections as do the laws of the United States. Our intellectual property is not protected

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by patents in several countries in which we do business, and we have limited patent protection in other countries, including the PRC. The cost of applying for patents in foreign countries and translating the applications into foreign languages requires us to select carefully the inventions for which we apply for patent protection and the countries in which we seek such protection. Generally, our efforts to obtain international patents have been concentrated in the European Union and certain industrialized countries in Asia, including Korea, Japan, and Taiwan. If we are unable to protect our intellectual property successfully, our business, financial condition, and results of operations could be materially and adversely affected.

The PRC commercial law is relatively undeveloped compared to the commercial law in the United States. Limited protection of intellectual property is available under PRC law. Consequently, manufacturing our products in the PRC may subject us to an increased risk that unauthorized parties may attempt to copy our products or otherwise obtain or use our intellectual property. We may not be able to protect our intellectual property rights effectively. Additionally, we may not have adequate legal recourse in the event that we encounter infringements of our intellectual property in the PRC.

Our legacy inverter products may suffer higher than anticipated litigation, damage or warranty claims.

Our legacy inverter products (of which we discontinued the manufacture, engineering, and sale in December 2015 and which are reflected as Discontinued Operations in this filing) contain components that may contain errors or defects and were sold with original product warranties ranging from one to ten years with an option to purchase additional warranty coverage for up to 20 years. If any of our products are defective or fail because of their design, we might be required to repair, redesign or recall those products or to pay damages (including liquidated damages) or warranty claims, and we could suffer significant harm to our reputation. We are experiencing claims from customers and suppliers and in some cases litigation related to the legacy inverter product line. Prior suppliers of the legacy inverter business have made claims and have pursued lawsuits ranging from allegations of losses associated with raw material inventory and other commercial claims, to an allegation of improper use of proprietary design. We review such claims and vigorously defend against such lawsuits in the ordinary course of our business. We cannot assure you that any such claims or litigation brought against us will not have a material adverse effect on our business or financial statements. Our involvement in such litigation could result in significant expense to us and divert the efforts of our technical and management personnel. We also accrue a warranty reserve for estimated costs to provide warranty services including the cost of technical support, product repairs, and product replacement for units that cannot be repaired. Our estimate of costs to fulfill our warranty obligations is based on historical experience and expectation of future conditions. To the extent we experience increased warranty claim activity or increased costs associated with servicing those claims, our warranty accrual will increase, resulting in additional expenses in the line "Income (loss) from discontinued operations, net of tax” on our Consolidated Statement of Operations in future periods. We plan to continue supporting inverter customers with service maintenance and repair operations. This includes performing service to fulfill obligations under existing service maintenance contracts. There is no certainty that these can be performed profitably and could be adversely affected by higher than anticipated product failure rates, loss of critical service technician skills, an inability to obtain service parts, customer demands and disputes and cost of repair parts, among other factors. See Note 3. Discontinued Operations in Item 8 "Financial Statements and Supplementary Data".

Our products may suffer from defects or errors leading to damage or warranty claims.

Our products use complex system designs and components that may contain errors or defects, particularly when we incorporate new technology into our products or release new versions. If any of our products are defective or fail because of their design, we might be required to repair, redesign or recall those products, pay damages (including liquidated damages) or warranty claims, and we could suffer significant harm to our reputation. We accrue a warranty reserve for estimated costs to provide warranty services including the cost of technical support, product repairs, and product replacement for units that cannot be repaired. Our estimate of costs to fulfill our warranty obligations is based on historical experience and expectation of future conditions. To the extent we experience increased warranty claim activity or increased costs associated with servicing those claims, our warranty accrual will increase, resulting in decreased gross profit. In recent years, we have experienced increased warranty costs for our legacy inverter product lines, which is reflected in "Income from discontinued operations, net of income taxes." See Note 3. Discontinued Operations in Item 8 "Financial Statements and Supplementary Data".

Unfavorable currency exchange rate fluctuations may lead to lower operating margins, or may cause us to raise prices, which could result in reduced sales.

Currency exchange rate fluctuations could have an adverse effect on our sales and results of operations and we could experience losses with respect to forward exchange contracts into which we may enter. Unfavorable currency fluctuations could require us to increase prices to foreign customers, which could result in lower net sales by us to such customers. Alternatively, if we do not adjust the prices for our products in response to unfavorable currency fluctuations, our results of

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operations could be materially and adversely affected. In addition, most sales made by our foreign subsidiaries are denominated in the currency of the country in which these products are sold and the currency in which they receive payment for such sales could be less valuable at the time of receipt as a result of exchange rate fluctuations. Given recent acquisitions in Europe, our exposure to fluctuations in the value of the Euro is becoming more significant. From time to time, we enter into forward exchange contracts and local currency purchased options to reduce currency exposures related to likely or pending transactions including those arising from intercompany sales of inventory. However, we cannot be certain that our efforts will be adequate to protect us against significant currency fluctuations or that such efforts will not expose us to additional exchange rate risks, which could materially and adversely affect our results of operations.

Recent developments relating to the United Kingdom's referendum vote in favor of leaving the European Union and related actions could adversely affect us.

On June 23, 2016, the United Kingdom (UK) held a referendum in which voters approved an exit from the European Union ("EU"). On March 29, 2017, the UK's ambassador to the EU delivered a letter to the president of the European Council that gave formal notice under Article 50 of the Lisbon Treaty of UK's withdrawal from the EU, commonly referred to as "Brexit". As a result, negotiations have commenced to determine the terms of the UK's withdrawal from the EU as well as its relationship with the EU going forward, including the terms of trade between the UK and the EU. Although it is unknown what those terms will be, it is possible that there will be greater restrictions on imports and exports between the UK and EU countries and increased regulatory complexities. These changes may adversely affect our sales, operations and financial results. In particular, our operations in the UK may be adversely affected by extreme fluctuations in the UK exchange rates. Moreover, the imposition of any import restrictions and duties levied on our UK products as imported for EU customers may make our products more expensive for such customers and less competitive from a pricing perspective.

Changes in the value of the Chinese yuan could impact the cost of our operation in Shenzhen, PRC and our sales growth in our PRC markets.

The PRC government is continually pressured by its trading partners to allow its currency to float in a manner similar to other major currencies. In 2016, the PRC's currency devalued by a cumulative 6.5% against the U.S. dollar, making Chinese exports cheaper and imports into the PRC more expensive by that amount. This devaluation negatively impacts U.S. businesses that trade with the PRC because it puts them at a cost disadvantage. Any change in the value of the Chinese yuan may impact our ability to control the cost of our products in the world market. Specifically, the decision by the PRC government to allow the yuan to begin to float against the United States dollar could significantly increase the labor and other costs incurred in the operation of our Shenzhen facility and the cost of raw materials, parts, components, and subassemblies that we source in the PRC, thereby having a material and adverse effect on our financial condition and results of operations.

Difficulties with our enterprise resource planning (“ERP”) system and other parts of our global information technology system could harm our business and results of operation.

Like many multinational corporations, we maintain a global information technology system, including software products licensed from third parties. Any system, network or Internet failures, misuse by system users, the hacking into or disruption caused by unauthorized access or loss of license rights could disrupt our ability to timely and accurately manufacture and ship products or to report our financial information in compliance with the timelines mandated by the SEC. Any such failure, misuse, hacking, disruptions or loss would likely cause a diversion of management's attention from the underlying business and could harm our operations. In addition, a significant failure of our global information technology system could adversely affect our ability to complete an evaluation of our internal controls and attestation activities pursuant to Section 404 of the Sarbanes-Oxley Act of 2002.

If our network security measures are breached and unauthorized access is obtained to a customer's data or our data or our information technology systems, we may incur significant legal and financial exposure and liabilities.

As part of our day-to-day business, we store our data and certain data about our customers in our global information technology system. Unauthorized access to our data, including any regarding our customers, could expose us to a risk of loss of this information, loss of business, litigation and possible liability. These security measures may be breached by intentional misconduct by computer hackers, as a result of third-party action, employee error, malfeasance or otherwise. Additionally, third parties may attempt to fraudulently induce employees or customers into disclosing sensitive information such as user names, passwords or other information in order to gain access to our customers' data or our data, including our intellectual property and other confidential business information, or our information technology systems. Because the techniques used to obtain unauthorized access, or to sabotage systems, change frequently and generally are not recognized until launched against a target, we may be unable to anticipate these techniques or to implement adequate preventative measures. Any security

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breach could result in a loss of confidence by our customers, damage our reputation, disrupt our business, lead to legal liability and negatively impact our future sales.

The loss of any of our key personnel could significantly harm our results of operations and competitive position.

Our success depends to a significant degree upon the continuing contributions of our key management, technical, marketing, and sales employees. We may not be successful in retaining our key employees or attracting or retaining additional skilled personnel as required. Failure to retain or attract key personnel could significantly harm our results of operations and competitive position. We must develop our personnel to provide succession plans capable of maintaining continuity in the midst of the inevitable unpredictability of personnel retention. While we have plans for key management succession and long-term compensation plans designed to retain our senior employees, if our succession plans do not operate effectively, our business could be adversely affected.

Deterioration of demand for our inverter services could negatively impact our business.

Our business may be adversely affected by changes in national or global demand for our inverter service repair capabilities. Any such changes could adversely affect the carrying amount of our inverter service inventories, thereby negatively affecting our financial results from Continuing Operations.

We have been, and in the future may again be, involved in litigation. Litigation is costly and could result in further restrictions on our ability to conduct business or make use of market relationships we have developed, or an inability to prevent others from using technology.

Litigation may be necessary to enforce our commercial or property rights, to defend ourselves against claimed violations of such rights of others, or to protect our interests in regulatory, tax, customs, commercial, and other disputes or similar matters. Litigation often requires a substantial amount of our management's time and attention, as well as financial and other resources, including:

- substantial costs in the form of legal fees, fines, and royalty payments;
- restrictions on our ability to sell certain products or in certain markets;
- an inability to prevent others from using technology we have developed; and
- a need to redesign products or seek alternative marketing strategies.

Any of these events could have a significant adverse effect on our business, financial condition, and results of operations.

Return on investments or interest rate declines on plan investments could result in additional unfunded pension obligations for the HiTek Power pension plan.

We currently have unfunded obligations in the HiTek Power pension plan. The extent of future contributions to the pension plan depends heavily on market factors such as the discount rate used to calculate our future obligations and the actual return on plan assets which enable future payments. We estimate future contributions to the plan using assumptions with respect to these and other items. Changes to those assumptions could have a significant effect on future contributions. Additionally, a material deterioration in the funded status of the plan could increase pension expenses and reduce our profitability. See Note 14. Retirement Plans in Item 8 "Financial Statements and Supplementary Data" contained herein.

Funds associated with our marketable securities that we have traditionally held as short-term investments may not be liquid or readily available.

In the past, certain of our investments have been affected by external market conditions that impacted the liquidity of the investment. We do not currently have investments with reduced liquidity, but external market conditions that we cannot anticipate or mitigate may impact the liquidity of our marketable securities. Any changes in the liquidity associated with these investments may require us to borrow funds at terms that are not favorable or repatriate cash from international locations at a significant cost. We cannot be certain that we will be able to borrow funds or continue to repatriate cash on favorable terms, or at all. If we are unable to do so, our available cash may be reduced until those investments can be liquidated. The lack of available cash may prevent us from taking advantage of business opportunities that arise and may prevent us from executing some of our business plans, either of which could cause our business, financial condition or results of operations to be materially and adversely affected.

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Our intangible assets may become impaired.
As of December 31, 2017, we have $53.8 million of goodwill and $33.5 million in intangible assets. We periodically review the estimated useful lives of our goodwill and identifiable intangible assets, taking into consideration any events or circumstances that might result in either a diminished fair value, or for intangible assets, a revised useful life. The events and circumstances include significant changes in the business climate, legal factors, operating performance indicators, and competition. Any impairment or revised useful life could have a material and adverse effect on our financial position and results of operations, and could harm the trading price of our common stock.
We are subject to numerous governmental regulations.
We are subject to federal, state, local and foreign regulations, including environmental regulations and regulations relating to the design and operation of our products and control systems and regulations governing the import, export and customs duties related to our products. We might incur significant costs as we seek to ensure that our products meet safety and emissions standards, many of which vary across the states and countries in which our products are used. In the past, we have invested significant resources to redesign our products to comply with these directives. Compliance with future regulations, directives, and standards could require us to modify or redesign some products, make capital expenditures, or incur substantial costs. Also, we may incur significant costs in complying with the myriad of different import, export and customs regulations as we seek to sell our products internationally. If we do not comply with current or future regulations, directives, and standards:
- we could be subject to fines and penalties;
- our production or shipments could be suspended; and
- we could be prohibited from offering particular products in specified markets.

If we were unable to comply with current or future regulations, directives and standards, our business, financial condition and results of operations could be materially and adversely affected.
Financial reform legislation will result in new laws and regulations that may increase our costs of operations.
The Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act") requires various federal agencies to adopt a broad range of new implementing rules and regulations, and to prepare numerous studies and reports for Congress. On August 22, 2012, under the Dodd-Frank Act, the SEC adopted new requirements for companies that use certain minerals and metals, known as conflict minerals, in their products, whether or not these products are manufactured by third parties. These requirements require companies to perform due diligence, disclose and report whether or not such minerals originate from the Democratic Republic of Congo and adjoining countries. We have to perform sufficient due diligence to determine whether such minerals are used in the manufacture of our products. However, the implementation of these requirements could adversely affect the sourcing, availability and pricing of such minerals if they are found to be used in the manufacture of our products. In addition, we incur costs to comply with the disclosure requirements, including costs related to determining the source of any of the relevant minerals and metals used in our products. Since our supply chain is complex, we may not be able to sufficiently verify the origins for these minerals and metals used in our products through the due diligence procedures that we implement, which may harm our reputation. In such event, we may also face difficulties in satisfying customers who require that all of the components of our products are certified as conflict mineral free.
The market price of our common stock has fluctuated and may continue to fluctuate for reasons over which we have no control.
The stock market has from time to time experienced, and is likely to continue to experience, extreme price and volume fluctuations. Prices of securities of technology companies have been especially volatile and have often fluctuated for reasons that are unrelated to their operating performance. In the past, companies that have experienced volatility in the market price of their stock have been the subject of securities class action litigation. If we were the subject of securities class action litigation, it could result in substantial costs and a diversion of management’s attention and resources.
Our operating results are subject to fluctuations, and if we fail to meet the expectations of securities analysts or investors, our share price may decrease significantly.
Our annual and quarterly results may vary significantly depending on various factors, many of which are beyond our control. Because our operating expenses are based on anticipated revenue levels, our sales cycle for development work

is relatively long, and a high percentage of our expenses are fixed for the short term, a small variation in the timing of recognition of revenue can cause significant variations in operating results from period to period. If our earnings do not meet the expectations of securities analysts or investors, the price of our stock could decline.

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Deterioration of economic conditions could negatively impact our business.

Our business may be adversely affected by changes in national or global economic conditions, including inflation, interest rates, availability of capital markets, consumer spending rates, energy availability and costs (including fuel surcharges) and the effects of governmental initiatives to manage economic conditions. Any such changes could adversely affect the demand for our products both in domestic and export markets, or the cost and availability of our needed raw materials and packaging materials, thereby negatively affecting our financial results.

A disruption in credit and other financial markets and deterioration of national and global economic conditions, could, among other things:

- negatively impact global demand for our products, which could result in a reduction of sales, operating income and cash flows;
- make it more difficult or costly for us to obtain financing for our operations or investments or to refinance our debt in the future;
- cause our lenders to depart from prior credit industry practice and make more difficult or expensive the granting of any technical or other waivers under our debt agreements to the extent we may seek them in the future;
- decrease the value of our investments; and
- impair the financial viability of our insurers.

ITEM 1B.UNRESOLVED STAFF COMMENTS

None.

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ITEM 2. PROPERTIES

Information concerning our principal properties at December 31, 2017 is set forth below:

Location	Principal Activity	Ownership
Fort Collins, CO	Corporate headquarters, research and development, distribution, sales, and service	Leased
San Jose, CA	Distribution, sales, and service, research and development	Leased
Georgetown, MA	Service	Leased
Ronkonkoma, New York	Manufacturing, distribution, service, and research and development	Leased
Vancouver, WA	Research and development, manufacturing, distribution, sales, and service	Leased
Beijing, China	Sales	Leased
Shanghai, China	Distribution and sales	Leased
Shenzhen, China	Manufacturing, distribution, service, and research and development	Leased
Xian, China	Service	Leased
Metzingen, Germany	Distribution, sales, and service	Leased
Warstein-Belecke, Germany	Research, distribution, sales, and service	Leased
Pune, India	Distribution and sales	Leased
Cork, Ireland	Sales, service, and research and development	Leased
Tokyo, Japan	Sales	Leased
Singapore	Sales and service	Leased
Hwasung Kyunggi-do, South Korea	Distribution, sales, and service	Leased
Sungnam City, South Korea	Distribution, sales, service and research and development	Owned
Villaz-St-Pierre, Switzerland	Research and development	Leased
Taipei, Taiwan	Distribution, sales, and service	Leased
Littlehampton, United Kingdom	Manufacturing, distribution, service, and research and development	Leased

We consider the properties that we own or lease as adequate to meet our current and future requirements. We regularly assess the size, capability, and location of our global infrastructure and periodically make adjustments based on these assessments.

ITEM 3. LEGAL PROCEEDINGS

We are presently involved in disputes and legal actions arising in the normal course of our business. While we currently believe that the amount of any ultimate loss would not be material to our financial position, the outcome of these actions is inherently difficult to predict. In the event of an adverse outcome, the ultimate loss could have a material adverse effect on our financial position or reported results of operations. An unfavorable decision in patent litigation could require material changes in production processes and products or result in our inability to ship products or components found to have violated third-party patent rights. An unfavorable decision in a collection action against a customer we sold products to, or a claim or counterclaim from a customer related to alleged product failures, could also have a material adverse effect on our financial position or reported results of operations. We are engaged presently in such disputes and legal actions with customers for the inverter product line. We accrue loss contingencies in connection with our commitments and contingencies, including litigation, when it is probable that a loss has occurred and the amount of the loss can be reasonably estimated.

ITEM 4. MINE SAFETY DISCLOSURES

None.

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PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Principal Market and Price Range of Common Stock

Our common stock is listed on the NASDAQ Global Select Market under the symbol "AEIS." At February 13, 2018, the number of common stockholders of record was 324, and the closing sale price of our common stock on the NASDAQ Global Select Market on that day was $64.36 per share.

The table below shows the range of high and low closing sale prices for our common stock as quoted (without retail markup or markdown and without commissions) on the NASDAQ Global Select Market:

	2017		2016	
	High	Low	High	Low
First Quarter	$70.64	$53.79	$34.99	$25.45
Second Quarter	86.25	63.81	38.85	32.35
Third Quarter	80.85	63.66	47.32	37.24
Fourth Quarter	95.00	67.39	56.91	45.73

Dividend Policy

We have not declared or paid any cash dividends on our capital stock in our history as a public company. We currently intend to retain all future earnings to finance our business or make stock repurchases and do not anticipate paying cash or other dividends on our common stock in the foreseeable future.

Share Repurchases

In September 2015, our Board of Directors authorized a program to repurchase up to $150.0 million of our stock. In November 2017, our Board of Directors approved an extension to the share repurchase program to December 2019 from its original maturity of March 2018. As of December 31, 2017, we had $70.0 million remaining for the authorized repurchase of shares.

In November 2015 we entered into a Fixed Dollar Accelerated Share Repurchase Transaction to purchase $50.0 million of shares of our common stock in the open market. A total of 1.7 million shares of our common stock was repurchased under the Fixed Dollar Accelerated Share Repurchase Agreement at an average price of $28.99 per share.

In August and December 2017, we entered into Fixed Dollar Share Repurchase Agreements to repurchase $25.0 million and $5.0 million, respectively, of shares of our common stock in the open market. Total shares repurchased under the Fixed Dollar Share Repurchase Agreements in August and December 2017 were 351,292 and 70,700, respectively, at an average price of $71.16 and $70.65, respectively, per share.

All shares repurchased were executed in the open market, and no shares were repurchased from related parties. Repurchased shares were retired and assumed the status of authorized and unissued shares. Accordingly, the associated cost of the repurchased shares were recognized as a reduction to Additional paid-in capital.

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The following table summarizes information with respect to the company's purchase of its common stock during the quarter ended December 31, 2017:

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Program (1)	Approximate Value of Shares that May Yet Be Purchased Under the Program (2)
December 1 - December 31, 2017	70,700	$ 70.65	70,700	$ 70,008,000
Total	70,700	$ 70.65	70,700	$ 70,008,000

(1) In September 2015, our Board of Directors authorized a program to repurchase up to $150.0 million of our stock over a thirty-month period. Under this program, in August and December 2017, we entered into two Fixed Dollar Share Repurchase Agreements to repurchase $25.0 million and $5.0 million, respectively, of shares of our common stock in the open market.

(2) While the Company has remaining authority to repurchase up to $70.0 million of our common stock, the Company has no current commitments or obligations to repurchase any shares of our common stock.

Performance Graph

The performance graph below shows the five-year cumulative total stockholder return on our common stock during the period from December 31, 2012 through December 31, 2017. This is compared with the cumulative total return of the NASDAQ Composite Index and the Philadelphia Semiconductor Index (PHLX) over the same period. The comparison assumes $100 was invested on December 31, 2012 in Advanced Energy common stock and in each of the foregoing indices and assumes reinvestment of dividends, if any. Dollar amounts in the graph are rounded to the nearest whole dollar. The performance shown in the graph represents past performance and should not be considered an indication of future performance.

(1) $100 invested on 12/31/2012 in our stock or index, including reinvestment of dividends. Indices and our stock performance calculated on a calendar year-end basis.

	12/12	12/13	12/14	12/15	12/16	12/17
Advanced Energy Industries, Inc.	$ 100.00	$ 165.55	$ 171.63	$ 204.43	$ 396.48	$ 488.67
NASDAQ Composite	100.00	141.63	162.09	173.33	187.19	242.29
PHLX Semiconductor	100.00	130.15	167.68	156.67	208.23	292.66

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Information relating to compensation plans under which our equity securities are authorized for issuance is set forth in Part III, Item 12 of this Annual Report on Form 10-K.

ITEM 6. SELECTED FINANCIAL DATA

The selected Consolidated Statements of Operations and related Consolidated Balance Sheets data were derived from our audited Consolidated Financial Statements. The information below is not necessarily indicative of results of future operations and should be read in conjunction with Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” of this Form 10-K in order to understand more fully the factors that may affect the comparability of the information presented below:

	Years Ended December 31,				
	2017	2016	2015	2014	2013
Consolidated Statements of Operations Data:					
Sales	$671,012	$483,704	$414,811	$367,333	$299,381
Operating income	200,770	126,857	106,656	86,091	47,847
Income from continuing operations before income taxes	198,191	128,076	105,442	86,005	48,322
Income from continuing operations, net of income taxes	136,101	116,948	83,482	69,495	59,710
Income (loss) from discontinued operations, net of income taxes	1,760	10,506	(241,968)	(22,513)	(27,624)
Net income (loss)	137,861	127,454	(158,486)	46,982	32,086
Earnings per Share:					
Continuing Operations:					
Basic earnings per share	$3.42	$2.94	$2.05	$1.72	$1.51
Diluted earnings per share	$3.39	$2.92	$2.03	$1.69	$1.47
Discontinued Operations:					
Basic earnings (loss) per share	$0.04	$0.26	$(5.94)	$(0.56)	$(0.70)
Diluted earnings (loss) per share	$0.04	$0.26	$(5.94)	$(0.56)	$(0.70)
Net Income (Loss):					
Basic earnings (loss) per share	$3.47	$3.21	$(3.89)	$1.16	$0.81
Diluted earnings (loss) per share	$3.43	$3.18	$(3.89)	$1.14	$0.79
Basic weighted-average common shares outstanding	39,754	39,720	40,746	40,420	39,597
Diluted weighted-average common shares outstanding	40,176	40,031	41,077	41,034	40,667
Consolidated Balance Sheets Data:					
Total assets	$733,308	$571,529	$462,503	$684,409	$648,992

ITEM 7. MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Certain statements set forth below under this caption constitute forward-looking statements. See “Special Note Regarding Forward-Looking Statements” in Item 1 "Business" of this Annual Report on Form 10-K for additional factors relating to such statements, and see “Risk Factors” in Item 1A for a discussion of certain risks applicable to our business, financial condition and results of operations.

Overview

We design, manufacture, sell, and support power conversion products that transform power into various usable forms. Our products enable manufacturing processes that use thin film technology for various products, such as semiconductor devices, flat panel displays, thin film renewables, architectural glass, optical coating and consumer products decorative and functional coating. We also supply thermal instrumentation products for advanced temperature measurement and control in the thin film process for these same markets. Our power control modules provide power control solutions for industrial applications where heat treatment and processing are used such as glass manufacturing, metal fabrication and treatment, material and chemical processing. Our high voltage power supplies and modules are used in applications such as semiconductor ion implantation, scanning electron microscopy, chemical analysis such as mass spectrometry and various applications using X-ray technology and electron guns for both analytical and processing applications. Our network of global service support centers provides a recurring revenue opportunity as we offer repair services, conversions, upgrades, and refurbishments and used equipment to companies using our products.

Driven by continuing technology migration and changing customers demand the markets we serve are constantly changing in terms of advancement in applications, core technology and competitive pressures. New products we design for capital equipment manufacturers typically have a lifespan of five to ten years. Our success and future growth depends on our products being designed into our customers new generations of equipment as they develop new technologies and applications. We must work with these manufacturers early in their design cycles to modify, enhance and upgrade our products or design new products that meet the requirements of their new systems. The design win process is highly competitive and we may win or lose new design wins for our existing customers or new customers next generations of equipment. In case existing or new customers do not choose our products as a result of the development, evaluation and qualification efforts related to the design win process, our market share will be reduced, the potential revenues related to the lifespan of our customers' products, which can be 5-10 years, will not be realized, and our business, financial condition and results of operations would be materially and adversely impacted.

We enter 2018 looking to strengthen our position and grow revenue through new products, design wins, new applications and geographical growth, continuously emphasizing margin expansion, cash generation and cost improvement.

CRITICAL ACCOUNTING ESTIMATES

The preparation of Consolidated Financial Statements and related disclosures in conformity with accounting principles generally accepted in the United States of America (“U.S. GAAP”) requires management to make judgments, assumptions, and estimates that affect the amounts reported. Note 1. Operations and Summary of Significant Accounting Policies and Estimates in Item 8 "Financial Statements and Supplementary Data" describes the significant accounting policies used in the preparation of our Consolidated Financial Statements. The accounting positions described below are significantly affected by critical accounting estimates. Such accounting positions require significant judgments, assumptions, and estimates to be used in the preparation of the Consolidated Financial Statements, actual results could differ materially from the amounts reported based on variability in factors affecting these statements.

Revenue Recognition

We recognize revenue from product sales upon transfer of title and risk of loss to our customers provided that there is evidence of an arrangement, the sales price is fixed or determinable, and the collection of the related receivable is reasonably assured. In most transactions, we have no obligations to our customers after the date products are shipped, other than pursuant to warranty obligations. Shipping and handling fees billed to customers, if any, are recognized as revenue. The related shipping and handling costs are recognized in cost of sales.

We maintain a credit approval process and we make significant judgments in connection with assessing our customers’ ability to pay at the time of shipment. Despite this assessment, from time to time, our customers are unable to meet their payment obligations. We continuously monitor our customers’ credit worthiness and use our judgment in establishing a provision for estimated credit losses based upon our historical experience and any specific customer collection issues that we have identified. While such credit losses have historically been within our expectations and the provisions established, a significant change in the liquidity or financial position of our customers could have a material adverse impact on the collectability of accounts receivable and our future operating results. Additionally, if our credit loss rates prove to be greater than we currently estimate, we record additional reserves for doubtful accounts.

Inventory

We value our inventory at the lower of cost (first-in, first-out method) or market. We regularly review inventory quantities on hand and record a provision to write-down excess and obsolete inventory to its estimated net realizable value, if less than cost, based primarily on our estimated forecast of product demand. Demand for our products can fluctuate significantly. Our industry is subject to technological change, new product development, and product technological obsolescence that could result in an increase in the amount of obsolete inventory quantities on hand. Therefore, any significant unanticipated changes in demand or technological developments in excess of our current estimates could have a significant impact on the value of our inventory and our reported operating results.

Warranty Costs

We provide for the estimated costs to fulfill customer warranty obligations upon the recognition of the related revenue. We offer warranty coverage for a majority of our Precision Power products for periods typically ranging from 12 to 24 months after shipment. We warranted our inverter products for five to ten years and provided the option to purchase additional warranty coverage up to 20 years. The product warranty expense accrued related to our standard inverter product warranties is now considered part of our discontinued operations and is recorded as such on our Consolidated Balance Sheets. See Note 3. Discontinued Operations in Item 8 "Financial Statements and Supplementary Data" for more information on our discontinued operations and Note 12. Warranties in Item 8 "Financial Statements and Supplementary Data" for more information on our warranties from continuing operations. We estimate the anticipated costs of repairing our products under such warranties based on the historical costs of the repairs. The assumptions we use to estimate warranty accruals are reevaluated periodically, in light of actual experience, and when appropriate, the accruals are adjusted. Should product failure rates differ from our estimates, actual costs could vary significantly from our expectations.

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Goodwill, Intangible and Other Long-Lived Assets

As a result of our acquisitions, we recorded goodwill and intangible assets. Goodwill and indefinite-lived intangible assets are subject to annual impairment testing, as well as testing upon the occurrence of any event that indicates a potential impairment. The annual impairment test can be performed using an assessment of qualitative factors in determining if it is more likely than not that goodwill is impaired. If this assessment indicates that it is more likely than not that goodwill is impaired, then the next step of impairment testing compares the fair value of a reporting unit to its carrying value. Goodwill would be impaired if the resulting implied fair value of goodwill was less than the recorded carrying value of the goodwill.

Finite-lived intangible assets and other long-lived assets are subject to an impairment test if there is an indicator of impairment. When we determine that the carrying value of intangibles or other long-lived assets may not be recoverable based upon the existence of one or more indicators of impairment, we use the projected undiscounted cash flow method to determine whether an impairment exists, and then measure the impairment using discounted cash flows and other fair value measurements. The carrying value and ultimate realization of these assets is dependent upon our estimates of future earnings and benefits that we expect to generate from their use. If our expectations of future results and cash flows are significantly diminished, intangible assets, long-lived assets, and goodwill may be impaired and the resulting charge to operations may be material. Additionally, the estimation of useful lives and expected cash flows require us to make significant judgments regarding future periods that are subject to some factors outside of our control. Changes in these estimates could result in significant revisions to our carrying value of these assets and may result in material charges to our results of operations.

In 2017, we performed an assessment of qualitative factors for our annual impairment test of the goodwill. The factors reviewed included macroeconomic conditions, industry and market conditions, cost factors, and overall financial performance. This assessment resulted in the conclusion that there was no impairment of goodwill in 2017.

Income Taxes

We are subject to income taxes in the United States and numerous foreign jurisdictions. Significant judgment is required in determining our provision for income taxes and income tax assets and liabilities, including evaluating uncertainties in the application of accounting principles and complex tax laws. We record a provision for income taxes for the anticipated tax consequences of the reported results of operations using the asset and liability method. Under this method, we recognize deferred tax assets and liabilities for the expected future tax consequences of temporary differences between the financial reporting and tax bases of assets and liabilities, as well as for operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using the tax rates that are expected to apply to taxable income for the years in which those tax assets and liabilities are expected to be realized or settled. We calculate tax expense consistent with intraperiod tax allocation methodology resulting in an allocation of current year tax expense/benefit between continuing operations and discontinued operations. We record a valuation allowance to reduce our deferred tax assets to the net amount that we believe is more likely than not to be realized. We recognize tax benefits from uncertain tax positions only if we believe that it is more likely than not that the tax position will be sustained on examination by the taxing authorities based on the technical merits of the position. Although we believe that we have adequately reserved for our uncertain tax positions, we can provide no assurance that the final tax outcome of these matters will not be materially different. We make adjustments to these reserves when facts and circumstances change, such as the closing of a tax audit or the refinement of an estimate. To the extent that the final tax outcome of these matters is different than the amounts recorded, such differences will affect the provision for income taxes in the period in which such determination is made and could have a material impact on our financial condition and operating results. The provision for income taxes includes the effects of any reserves that we believe are appropriate, as well as the related net interest and penalties. For more details see Note. 4 Income Taxes in Item 8 "Financial Statements and Supplementary Data."

On December 22, 2017, the U.S. enacted the 2017 Tax Cuts and Jobs Act (the Tax Act) into law and the new legislation contains several key tax provisions that affected us, including a one-time mandatory transition tax on our accumulated foreign earnings and a reduction of the corporate income tax rate to 21%, effective January 1, 2018, among others. We are required to recognize the effect of the tax law changes in the period of enactment, such as determining the transition tax, re-measuring our U.S. deferred tax assets and liabilities as well as reassessing the net realizability of our deferred tax assets and liabilities. In December 2017, the SEC staff issued Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act (SAB 118), which allows us to record provisional amounts during a measurement period not to extend beyond one year of the enactment date. Since the Tax Act was passed late in the fourth quarter of 2017, and ongoing guidance and accounting interpretation is expected over the next 12 months, we consider the accounting for the transition tax, deferred tax re-measurements, and other items to be incomplete due to the forthcoming guidance and our ongoing analysis of final year-end data and tax positions. We expect to complete our analysis within the measurement period in accordance with SAB 118.

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Business Environment and Trends

SEMICONDUCTORS

Investment in semiconductor capital equipment increased approximately 31% year over year in 2017. Sales to our semiconductor OEM customers continued to increase quarter over quarter throughout the year. Sales in the fourth quarter of 2017 represented a record for our semiconductor business. The semiconductor market is being driven by the rapid adoption of solid-state drives (SSD) deploying the latest 3D-NAND memory devices and a ramp of advanced Logic devices at the 10nm technology node.

The industry's transition to 3D memory devices and advanced Logic is generating increasing demand for RF power supplies, matches and accessories. The growing number of steps associated with the deposition and etch processes is driving an increase in the number of process chambers per fab and higher content of more advanced power solutions per chamber. As etching processes become more challenging due to increasing aspect ratios in advanced 3D devices, more advanced RF technology that includes pulsing and increased control and instrumentation is needed. We are capitalizing on these trends and providing a broader range of more complex combinations of RF power and frequencies and launching more capable matching networks to manage and control the delivered power.

INDUSTRIAL POWER

Customers in the industrial capital equipment market incorporate our industrial process power and specialty power products into a wide variety of equipment used in applications such as thin films, advanced material fabrication, and analytical instrumentation.

In industrial applications, we remain focused on taking our products into new applications and world regions, increasing our penetration into Asia, Europe and North America. In 2017, we made gains across an array of industries. The flat panel display market showed continued strength with the ongoing ramp of OLED mobile screen capacity. Demand for our products used in many industrial thin film coating and specialty power markets increased, particularly in manufacturing areas for products such as solar panels, consumer device coatings, flat panel displays and analytical instrumentation. Our thermal process control and measurement instruments are also making gains in North America, where we have focused for regional expansion.

Results of Continuing Operations

Our analysis presented below is organized to provide the information we believe will facilitate an understanding of our historical performance and relevant trends going forward, and should be read in conjunction with our Consolidated Financial Statements, including the notes thereto, in Item 8 "Financial Statements and Supplementary Data" of this Annual Report on Form 10-K.

Advanced Energy is organized as a single business unit, which principally serves OEM and end customers in the semiconductor, flat panel display, high and low voltage, solar panel, and other capital equipment markets. As of December 31, 2015 we discontinued our inverter products manufacturing and sales. All prior periods disclosed have been recast to reflect continuing operations. Results of discontinued operations are reflected as "Income (loss) from discontinued operations, net of income taxes" in our Consolidated Statements of Operations. See Note 3. Discontinued Operations in Item 8 "Financial Statements and Supplementary Data."

The following table sets forth, for the periods indicated, certain data derived from our Consolidated Statements of Operations (in thousands):

	Years Ended December 31,		
	2017	2016	2015
Sales	$671,012	$483,704	$414,811
Gross profit	356,381	253,147	216,870
Operating expenses	155,611	126,290	110,214
Operating income	200,770	126,857	106,656
Other income (expense)	(2,579)	1,219	(1,214)
Income from continuing operations before income taxes	198,191	128,076	105,442
Provision for income taxes	62,090	11,128	21,960
Income from continuing operations, net of income taxes	$136,101	$116,948	$83,482

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The following table sets forth, for the periods indicated, the percentage of sales represented by certain items reflected in our Consolidated Statements of Operations (in thousands):

	Years Ended December 31,		
	2017	2016	2015
Sales	100.0 %	100.0 %	100.0 %
Gross profit	53.1 %	52.3 %	52.3 %
Operating expenses	23.1 %	26.2 %	26.5 %
Operating income	30.0 %	26.1 %	25.8 %
Other income (expense)	(0.4)%	0.3 %	(0.3)%
Income from continuing operations before income taxes	29.6 %	26.4 %	25.5 %
Provision for income taxes	9.3 %	2.3 %	5.3 %
Income from continuing operations, net of income taxes	20.3 %	24.1 %	20.2 %

SALES

The following tables summarize annual net sales and percentages of net sales, by product line, for each of the years ended 2017, 2016 and 2015 (in thousands):

	Years Ended December 31,			Change			
	2017	2016	2015	2017 v. 2016		2016 v. 2015	
Semiconductor capital equipment	$461,701	$326,316	$266,465	$135,385	41.5%	$59,851	22.5%
Industrial capital equipment	116,949	84,263	84,217	32,686	38.8%	46	0.1 %
Global Support	92,362	73,125	64,129	19,237	26.3%	8,996	14.0%
Total	$671,012	$483,704	$414,811	$187,308	38.7%	$68,893	16.6%

	Years Ended December 31,		
	2017	2016	2015
Semiconductor capital equipment	68.8 %	67.5 %	64.2 %
Industrial power capital equipment	17.4 %	17.4 %	20.3 %
Global Support	13.8 %	15.1 %	15.5 %
Total	100.0%	100.0%	100.0%

OPERATING EXPENSE

The following table summarizes our operating expense as a percentage of sales for the years ended December 31, 2017, 2016 and 2015 (in thousands):

	Years Ended December 31,					
	2017		2016		2015	
Research and development	$57,999	8.6 %	$44,445	9.2 %	$39,551	9.5 %
Selling, general, and administrative	93,262	13.9%	77,678	16.1%	66,097	15.9%
Amortization of intangible assets	4,350	0.6 %	4,167	0.9 %	4,368	1.1 %
Restructuring charges	—	— %	—	— %	198	— %
Total operating expenses	$155,611	23.1%	$126,290	26.2%	$110,214	26.5%

2017 Results Compared To 2016

SALES

Total sales for the year ended December 31, 2017 increased 38.7% to $671.0 million from $483.7 million for the year ended December 31, 2016. The increase in sales was primarily due to demand in the semiconductor market driven by accelerated demand and strength in etch and CVD applications. We also experienced continued growth within our industrial products and

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global services. Total sales from Excelsys, which was acquired July 3, 2017, was $7.6 million for the year ended December 31, 2017.

In 2017, sales in our semiconductor market increased 41.5% to $461.7 million, and 68.8% of sales, from $326.3 million, and 67.5% of sales in 2016. Our growth in the semiconductor market has been fueled by our leadership in etch applications, specifically related to advanced memory and transition to 3DNAND, along with advances in logic technology. Sales growth was driven primarily by recent program wins which have moved into production and delivery.

Sales to the industrial capital equipment markets increased 38.8% to $116.9 million in 2017 from $84.3 million in 2016. The industrial markets we serve include solar panel, flat panel display, power control modules, data storage, architectural glass, high voltage and other industrial manufacturing markets. Our customers in these markets are primarily global and regional original equipment manufacturers. The increase in sales was primarily due to the expansion in advanced coating applications. Sales to the industrial capital equipment markets as a percentage of total sales remained flat at 17.4% in 2017 and 2016, due primarily to the strong growth in sales in our semiconductor market. Sales from the acquisition of Excelsys for the year ended December 31, 2017 was $7.6 million.

Global service sales increased 26.3% to $92.4 million from $73.1 million in 2016. Increased global service sales was due to share gains as well as growth in our installed product base. Despite this growth, global support revenue as a percentage of total sales decreased to 13.8% in 2017 from 15.1% in 2016, due to the strong growth in sales in our semiconductor market.

Sales to Applied Materials Inc. and Lam Research, our two largest customers, increased $109.6 million to $380.1 million, and 56.6% of sales, in 2017 from $270.5 million, and 55.9% of sales in 2016. Our sales to Applied Materials Inc. and Lam Research included sales for the semiconductor capital equipment market, as well as industrial capital equipment used in the solar and flat panel display markets.

Backlog

Our backlog was $131.3 million at December 31, 2017 as compared to $69.2 million at December 31, 2016. Backlog remains strong primarily due to demand within the semiconductor market.

GROSS PROFIT

Gross profit increased $103.2 million to $356.4 million in 2017 from $253.1 million in 2016 and is primarily attributed to increased sales volume. Gross profit as a percentage of sales in 2017 increased to 53.1% from 52.3% in 2016, due to increased volume as the semiconductor capital equipment market remains strong and favorable product mix. Gross profit from our 2017 acquisition of Excelsys was $3.1 million, which included $0.1 million associated with a step up in book basis for purchased inventory.

OPERATING EXPENSE

Research and Development

We perform research and development of products for new or emerging applications, technological changes to provide higher performance, lower cost, or other attributes that we may expect to advance our customers’ products. We believe that continued development of technological applications, as well as enhancements to existing products to support customer requirements, are critical for us to compete in the markets we serve. Accordingly, we devote significant personnel and financial resources to the development of new products and the enhancement of existing products, and we expect these investments to continue.

Research and development expenses in 2017 increased $13.6 million to $58.0 million, from $44.4 million in 2016 primarily due to our investment in new programs to maintain and increase our technological leadership and provide solutions to our customers' evolving needs. Research and development expense from our 2017 acquisition of Excelsys was $1.1 million.

Research and development expenses as a percentage of total revenue decreased to 8.6% in 2017 from 9.2% in 2016 as successful adoption of our products has driven increased sales.

Selling, General and Administrative

Our selling expenses support domestic and international sales and marketing activities that include personnel, trade shows, advertising, third-party sales representative commissions, and other selling and marketing activities. Our general and administrative expenses support our worldwide corporate, legal, tax, financial, governance,

administrative, information systems, and human resource functions in addition to our general management, including acquisition-related activities.
Selling general and administrative ("SG&A") expenses increased $15.6 million to $93.3 million in 2017 as compared to $77.7 million in 2016. The increase in SG&A expense is primarily driven by higher stock-based compensation and performance

bonus, investment in organizational structure to support business volumes and future growth, and costs associated with business development. SG&A expense from our 2017 acquisition of Excelsys was $1.8 million.

Amortization Expense

Amortization expense increased $0.2 million to $4.4 million in 2017 from $4.2 million in 2016. The increase of $0.2 million in 2017 is primarily due to the amortization of intangibles recognized upon the acquisition of Excelsys, which was completed July 3, 2017, partially offset by the affect of foreign exchange rates.

OTHER INCOME (EXPENSE)

Other income (expense), net consists primarily of interest income and expense, foreign exchange gains and losses, gains and losses on sales of fixed assets, and other miscellaneous items. Other income (expense) was a loss of $2.6 million in 2017, as compared to a gain of $1.2 million in 2016. The loss in 2017 was primarily the cost of a foreign currency exchange rate forward contract that we entered into for a potential offshore acquisition that we decided not to consummate. See Note 7. Derivative Financial Instruments in Item 8 "Financial Statements and Supplementary Data.". The gain in 2016 is principally related to gains recognized due to fluctuation in foreign exchange rates and our assets in different countries. Other income (expense), net includes interest expense, net of $0.1 million and $(0.1) million in 2017 and 2016, respectively.

PROVISION FOR INCOME TAXES FROM CONTINUING OPERATIONS

In 2017, we recorded income tax expense for our continuing operations of $62.1 million or an effective tax rate of 31.3%. Included in our 2017 tax expense is the estimated impact of the Tax Act which was passed December 22, 2017. Among other provisions, the Tax Act imposes a mandatory one-time transition tax on the accumulated earnings of our foreign subsidiaries. The Company estimates the 2017 financial statement expense related to the transition tax will approximate $61.8 million. Additionally, the Tax Act reduced the U.S. corporate income tax rate to 21%, effective January 1, 2018, from the previous 35% rate. The reduction in the U.S. corporate tax rate required the Company to re-value its net U.S. deferred tax assets and liabilities effective December 31, 2017. The Company estimates the 2017 financial statement expense related to the reduction of the U.S. tax rate to be $11.1 million. Additionally, in 2017, we recorded a tax benefit of $33.8 million associated with the wind down of our solar inverter business which was discontinued in 2015. After giving consideration to the above items, tax expense for our continuing operations would have been $23.0 million or an effective tax rate of 11.6%, as compared to tax expense of $11.1 million, or 8.7%, for 2016. The increase in the 2017 tax rate of 11.6% compared to the 2016 tax rate of 8.7% is primarily due to favorable settlements of tax audits in 2016. The 2017 effective tax rate differs from the federal statutory rate of 35% primarily due to the benefit of earnings in foreign jurisdictions which are subject to lower tax rates, benefits related to stock-based compensation and tax amortization.

2016 Results Compared To 2015

SALES

Total sales for the year ended December 31, 2016 increased 16.6% to $483.7 million from $414.8 million for the year ended December 31, 2015. The increase in sales was due to the rebound in the semiconductor market after a pause in the fourth quarter of 2015 as well as continued growth in our global support business.

In 2016, sales in our semiconductor market increased 22.5% to $326.3 million, and 67.5% of sales, from $266.5 million, and 64.2% of sales in 2015. These increases were driven by strong market conditions across the semiconductor market driven by our leadership in etch applications, specifically related to advanced memory and transition to 3DNAND, along with advances in logic technology.

Sales to the industrial capital equipment markets increased 0.1% to $84.3 million in 2016 from $84.2 million in 2015. The industrial markets we serve include solar panels, flat panel display, architectural glass, analytical instrumentation and other industrial manufacturing markets. Our customers in these markets are primarily global and regional original equipment manufacturers. Sales to the industrial capital equipment markets as a percentage of total sales decreased to 17.4% in 2016 from 20.3% in 2015, due primarily to the strong growth in sales in our semiconductor market.

Global support revenue increased by 14.0% to $73.1 million, and 15.1% of sales from $64.1 million, and 15.5% of sales in 2015. Increased global service sales was due to share gains as well as growth in the installed base. Despite this growth, global support revenue as a percentage of total sales decreased due to the strong growth in sales in our semiconductor market.

Sales to Applied Materials Inc. and Lam Research, our two largest customers, increased $62.8 million to $270.5 million, and 55.9% of sales, in 2016 from $207.7 million, and 50.1% of sales in 2015. Our sales to Applied Materials Inc. and Lam Research included sales for the semiconductor capital equipment market, as well as the solar and flat panel display markets.

GROSS PROFIT

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Gross profit increased $36.3 million to $253.1 million, and 52.3% of revenue in 2016 from $216.9 million, and 52.3% of revenue in 2015, due to increased sales volume, higher procurement volumes, better absorption of fixed overhead and general weakening of the Chinese yuan against the U.S. dollar. A substantial part of our direct labor and variable overhead costs are denominated in Chinese yuan.

OPERATING EXPENSE

Research and Development

We perform research and development of products for new or emerging applications, technological changes to provide higher performance, lower cost, or other attributes that we expect to advance our customers' products. We believe that continued development of technological applications, as well as enhancements to existing products to support customer requirements, are critical for us to compete in the markets we serve. Accordingly, we devote significant personnel and financial resources to the development of new products and the enhancement of existing products, and we expect these investments to continue.

Research and development expenses in 2016 increased $4.9 million to $44.4 million from $39.6 million in 2015 primarily due to our continued investment in product development to maintain and increase our technological leadership.

Research and development expenses as a percentage of total revenue decreased to 9.2% in 2016 from 9.5% in 2015 as successful adoption of our products has driven increased sales.

Selling, General and Administrative

Our selling expenses support domestic and international sales and marketing activities that include personnel, trade shows, advertising, internal and third-party sales representative commissions, and other selling and marketing activities. Our general and administrative expenses support our worldwide corporate, legal, tax, financial, governance, administrative, information systems, and human resource functions in addition to our general management.

SG&A expenses increased $11.6 million to $77.7 million in 2016 as compared to $66.1 million in 2015. The increases were primarily due to higher sales expense as we expanded our sales management and marketing team to support our growth diversification and geographical expansion plans, as well as, higher stock-based compensation expense, professional fees and costs associated with acquisition opportunities.

Amortization Expense

Amortization expense decreased $0.2 million to $4.2 million in 2016 compared to $4.4 million in 2015. The decrease of $0.2 million in 2016 is primarily due to the decrease in foreign exchange rates in Europe

Restructuring Charges

In June 2015, we committed to a restructuring plan in relation to the wind down of our Inverter business which concluded December 31, 2015 and accordingly our Inverter business has been reflected as a discontinued operation in our consolidate financial statements as of December 31, 2015. See Note 3. Discontinued Operations in Item 8 "Financial Statements and Supplementary Data." As a result of discontinued operations, amounts of general corporate overhead which had previously been reflected in our inverter segment have been included in the total operating expense in the table above in all periods presented.

OTHER INCOME (EXPENSE)

Other income (expense), net consists primarily of interest income and expense, foreign exchange gains and losses, and other miscellaneous items. Other income (expense), net increased $2.4 million to $1.2 million in 2016 from $(1.2) million in 2015. These gains are principally related to gains recognized due to fluctuation in foreign exchange rates and our assets in different countries. Other income (expense), net includes interest expense, net of $(0.1) million and $(0.9) million in 2016 and 2015, respectively.

PROVISION FOR INCOME TAXES FROM CONTINUING OPERATIONS

We recorded income tax expense of $11.1 million, or an effective tax rate of 8.7% in 2016, compared to 2015 income tax expense of $22.0 million, or an effective tax rate of 20.8%. The decrease in tax rate for 2016 is attributable to a tax benefit related to the early adoption of ASU 2016-09, "Improvements to Employee Share-Based Payment Accounting" and the favorable settlement of tax audits during 2016.

The effective rate differs from the federal statutory rate of 35% primarily due to the benefit of earnings in foreign jurisdictions which are subject to lower tax rates, a benefit related to foreign tax credits, favorable settlements of tax audits, and the early adoption of ASU 2016-09, "Improvements to Employee Share-Based Payment Accounting."

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Discontinued Operations

In December 2015, we completed the wind down of engineering, manufacturing and sales of our solar inverter product line (the "inverter business"). Accordingly, the results of our inverter business has been reflected as “Income (loss) from discontinued operations, net of income taxes” on our Condensed Consolidated Statements of Operations for all periods presented herein.

The effect of our sales of extended inverter warranties to our customers continues to be reflected in deferred revenue in our Consolidated Balance Sheets. Deferred revenue for extended inverter warranties and the associated costs of warranty service will be reflected in Sales and Cost of goods sold, respectively, from continuing operations in future periods in our Consolidated Statement of Operations, as the deferred revenue is earned and the associated services are rendered. Extended warranties related to the inverter product line are no longer offered.

The significant items included in Income (loss) from discontinued operations, net of income taxes (in thousands):

	Year Ended December 31,		
	2017	2016	2015
Sales	$—	$—	$95,856
Cost of sales	234	154	139,045
Total operating (income) expenses (including restructuring)	(1,576)	(3,894)	232,262
Operating income (loss) from discontinued operations	1,342	3,740	(275,451)
Other income (expense)	337	2,636	(55)
Income (loss) discontinued operations before income taxes	1,679	6,376	(275,506)
Benefit for income taxes	(81)	(4,130)	(33,538)
Income (loss) from discontinued operations, net of income taxes	$1,760	$10,506	$(241,968)

Operating income from discontinued operations for 2017 and 2016 includes the recovery of accounts receivable previously reserved for as well as the reduced settlements primarily of warranty liabilities recorded in previous years. Operating loss from discontinued operations from 2015 includes impairment charges of $198.7 million which consisted of $153.8 million from goodwill and intangible assets, $17.7 million of accounts receivable, $15.0 million in excess and obsolete inventory and $12.3 million in property, plant and equipment.

Non-GAAP Results

Management uses non-GAAP operating income and non-GAAP EPS to evaluate business performance without the impacts of certain non-cash charges and other charges which are not part of our usual operations. We use these non-GAAP measures to assess performance against business objectives, make business decisions, including developing budgets and forecasting future periods. In addition, management's incentive plans include these non-GAAP measures as criteria for achievements. These non-GAAP measures are not in accordance with U.S. GAAP and may differ from non-GAAP methods of accounting and reporting used by other companies. However, we believe these non-GAAP measures provide additional information that enables readers to evaluate our business from the perspective of management. The presentation of this additional information should not be considered a substitute for results prepared in accordance with U.S. GAAP.

The non-GAAP results presented below exclude the impact of non-cash related charges, such as the amortization of intangible assets, stock-based compensation, and restructuring charges, as well as acquisition-related costs and other nonrecurring costs, as they are not indicative of future performance. The tax effect of our non-GAAP adjustments represents the anticipated annual tax rate applied to each non-GAAP adjustment after consideration of their respective book and tax treatments.

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Reconciliation of Non-GAAP measure - operating expenses and operating income, excluding certain items	Years Ended December 31,		
	2017	2016	2015
Gross Profit from continuing operations, as reported	$356,381	$253,147	$216,870
Operating expenses from continuing operations, as reported	155,611	126,290	110,214
Adjustments:			
Restructuring charges	—	—	(197)
Acquisition-related costs	(150)	—	—
Stock-based compensation	(12,549)	(6,332)	(2,810)
Amortization of intangible assets	(4,350)	(4,167)	(4,368)
Non-GAAP operating expenses from continuing operations	138,562	115,791	102,839
Non-GAAP operating income from continuing operations	$217,819	$137,356	$114,031
Income from continuing operations, net of income taxes, as reported	$136,101	$116,948	$83,482
Adjustments:			
Restructuring charges	—	—	197
Acquisition-related costs	150	—	—
Stock-based compensation	12,549	6,332	2,810
Amortization of intangible assets	4,350	4,167	4,368
Loss on foreign exchange hedge	3,489	—	—
Incremental expense associated with start-up of the Asia regional headquarters	1,133	—	—
Nonrecurring tax (benefit) expense associated with inverter business	(33,837)	—	—
Tax Cuts and Jobs Act Impact	72,867	—	—
Tax effect of non-GAAP adjustments	(5,264)	(2,854)	(1,589)
Non-GAAP income from continuing operations, net of income taxes	$191,538	$124,593	$89,268

Impact of Inflation

In recent years, inflation has not had a significant impact on our operations. However, we continuously monitor operating price increases, particularly in connection with the supply of component parts used in our manufacturing process. To the extent permitted by competition, we pass increased costs on to our customers by increasing sales prices over time. Sales price increases, however, were not significant in any of the years presented herein.

Liquidity and Capital Resources

LIQUIDITY

We believe that adequate liquidity and cash generation is important to the execution of our strategic initiatives. Our ability to fund our operations, acquisitions, capital expenditures, and product development efforts may depend on our ability to generate cash from operating activities which is subject to future operating performance, as well as general economic, financial, competitive, legislative, regulatory, and other conditions, some of which may be beyond our control. Our primary sources of liquidity are our available cash, investments and, cash generated from current operations.

At December 31, 2017, we had $410.4 million in cash, cash equivalents, and marketable securities. We believe that adequate liquidity and cash generation will be important to the execution of our strategic initiatives. We believe that our current cash levels and our cash flows from future operations will be adequate to meet anticipated working capital needs, anticipated levels of capital expenditures, and contractual obligations for the next twelve months.

At December 31, 2017, we had $288.3 million in cash, cash equivalents, and marketable securities held by foreign subsidiaries. As a result of the recent Tax Act and the implementation of the Transition Tax, we have provided for U.S. tax on all foreign unremitted earnings. Accordingly, cash related to these unremitted earnings could be repatriated to the U.S. with minimal additional taxes. Such additional taxes would include foreign withholding taxes and US state income taxes. At this time, the Company has no plans to repatriate foreign cash and intends to invest such unremitted earnings indefinitely outside of the U.S.

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Consistent with the Company's capital deployment initiatives, the Company intends to utilize foreign cash to expand our international operations through internal growth and strategic acquisitions. If our intent changes or if these funds are needed for our U.S. operations, we would be required to accrue any associated taxes on some or all of these undistributed earnings and our effective tax rate would be adversely affected.
On February 1, 2018, we used $11.8 million of our available cash to acquire 100% of the outstanding stock of Trek Holdings Co., LTD ("Trek"), a privately held company with operations in Tokyo, Japan and Lockport, New York. Trek has a 95% ownership interest in its U.S. subsidiary which is also its primary operation. Trek designs, manufactures and sells high-voltage amplifiers, power supplies and generators, high-performance electrostatic measurement instruments and electrostatic discharge (ESD) sensors and monitors to the global marketplace. Trek's standard and custom-OEM products are used in industry and research in aerospace, automotive, electronics, electrostatics, materials, medical, military, nanotechnology, photovoltaic/solar, physics, plasma, semiconductor and test and measurement applications. For the twelve months ended December 31, 2017, Trek reported unaudited sales totaling approximately $20 million. Trek’s comprehensive portfolio of power supply products strengthen and accelerate Advanced Energy’s growth in high voltage applications.
Credit Facility
On July 28, 2017, the Company entered into a Loan Agreement (the “Loan Agreement”) with a bank which provides a revolving line of credit of up to $100.0 million subject to certain funding conditions through July 28, 2022. On December 21, 2017, the Company entered into the First Amendment to the Loan Agreement (“First Amendment”) to increase the line of credit to $150.0 million. The credit facility provides us greater future flexibility for execution of our strategic plans. At December 31, 2017, we had $150.0 million in available funding under the Loan Agreement. For more information on the Loan Agreement, see "Note 19. Credit Facility" in Item 8 "Financial Statements and Supplementary Data".
We terminated our previous $100.0 million secured revolving credit facility on September 9, 2016. There were no outstanding balances under this credit facility during 2016.
Share Repurchase Program
In September 2015, our Board of Directors authorized a program to repurchase up to $150.0 million of our stock over a thirty-month period (expiring in March 2018). In November 2017, our Board of Directors approved an extension to the $150.0 million share repurchase program until December 2019. At December 31, 2017, there remained $70.0 million available under the share repurchase program for future share repurchases.
During 2017, we entered into two Fixed Dollar Share Repurchase Agreements to purchase a total of $30.0 million of shares of our common stock in the open market. Total shares of our common stock repurchased during 2017 were 421,992 at an average price of $71.07 per share.
During 2015, we entered into a Fixed Dollar Accelerated Share Repurchase Agreement to purchase $50.0 million of shares of our common stock in the open market. A total of 1.7 million shares of our common stock was repurchased under the Fixed Dollar Accelerated Share Repurchase Agreement at an average price of $28.99 per share.
Shares of the company's stock that have been repurchased were retired and assumed the status of authorized and unissued shares. The associated cost of shares repurchased has been recognized as a reduction to Additional paid-in capital.

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CASH FLOWS

A summary of our cash provided by and used in operating, investing, and financing activities is as follows (in thousands):

	Years Ended December 31,		
	2017	2016	2015
Net cash provided by operating activities from continuing operations	$189,956	$127,144	$124,122
Net cash used in operating activities from discontinued operations	(7,255)	(7,857)	(19,413)
Net cash provided by operating activities	182,701	119,287	104,709
Net cash (used in) provided by investing activities from continuing operations	(28,082)	300	(13,219)
Net cash used in investing activities from discontinued operations	—	—	(46)
Net cash (used in) provided by investing activities	(28,082)	300	(13,265)
Net cash (used in) provided by financing activities from continuing operations	(31,307)	2,171	(45,528)
Net cash used in financing activities from discontinued operations	—	(29)	(14)
Net cash (used in) provided by financing activities	(31,307)	2,142	(45,542)
EFFECT OF CURRENCY TRANSLATION ON CASH	2,208	(1,932)	(1,467)
INCREASE IN CASH AND CASH EQUIVALENTS	125,520	119,797	44,435
CASH AND CASH EQUIVALENTS, beginning of period	289,517	169,720	125,285
CASH AND CASH EQUIVALENTS, end of period	415,037	289,517	169,720
Less cash and cash equivalents from discontinued operations	7,754	7,564	11,277
CASH AND CASH EQUIVALENTS FROM CONTINUING OPERATIONS, end of period	$407,283	$281,953	$158,443

2017 Compared To 2016

Net cash provided by operating activities

Net cash provided by operating activities in 2017 was $182.7 million, an increase of $63.4 million, or 53.2% compared to $119.3 million for the same period in 2016. The increase in net cash flows from operating activities was primarily due to improved earnings from continuing operations and timing of taxes, partially offset by increased cash required for accounts receivable and inventory to support current business volume.

Net cash (used in) provided by investing activities

Net cash (used in) provided by investing activities in 2017 was $(28.1) million, compared to $0.3 million in 2016. Included in cash used in investing activities for 2017 was $17.3 million for the acquisition of Excelsys and $3.5 million for the purchase of a foreign currency exchange hedge for an anticipated transaction which was not completed. Capital expenditures in 2017 increased $2.2 million from $6.8 million in 2016 to $9.0 million in 2017 to support new facilities and manufacturing operations.

Net cash (used in) provided by financing activities

Net cash (used in) provided by financing activities in 2017 was $(31.3) million, a $(33.4) million change from $2.1 million cash provided by financing activities in 2016. The increase in cash used in financing activities is due to the repurchase of $30.0 million in company stock in 2017.

2016 Compared To 2015

Net cash provided by operating activities

Net cash provided by operating activities in 2016 was $119.3 million, compared to $104.7 million in 2015. The increase of $14.6 million in net cash flows from operating activities was due to the increase in income from continuing operations, net of income taxes, offset partially by additional investment in working capital from increased sales volume.

Net cash flows provided by (used in) investing activities

Net cash provided by (used in) investing activities in 2016 was $0.3 million, a $13.6 million increase from cash used of $(13.3) million in 2015 primarily due to the net change in marketable securities.

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Capital expenditures increased $2.8 million to $6.8 million compared to $4.0 million in 2015. We expect to fund future capital expenditures with cash generated from operations.

Net cash flows provided by (used in) financing activities

Net cash provided by (used in) financing activities in 2016 was $2.1 million, a $47.7 million change from $(45.5) million cash used in 2015. The increase in cash provided by financing activities is due to the repurchase of $50.0 million in company stock in 2015.

Effect of currency translation on cash

The effect of foreign currency translations on cash had a $2.2 million favorable impact for the year ended December 31, 2017 compared to a $1.9 million unfavorable impact for the year ended December 31, 2016. Our foreign operations primarily sell products and incur expenses in the related local currency. Exchange rate fluctuations could require us to increase prices to foreign customers, which could result in lower net sales by us to such customers. Alternatively, if we do not adjust the prices for our products in response to unfavorable currency fluctuations, our results of operations could be adversely impacted. The functional currencies of our worldwide operations include U.S. dollar ("USD"), Canadian Dollar ("CAD"), Swiss Franc ("CHF"), Chinese Yuan ("CNY"), Euro ("EUR"), Pound Sterling ("GBP"), Indian Rupee ("INR"), Japanese Yen ("JPY"), South Korean Won ("KRW"), Singapore Dollar ("SGD") and New Taiwan Dollar ("TWD"). Our purchasing and sales activities are primarily denominated in USD, CNY, EUR and JPY.

The change in these key currency rates during the year ended December 31, 2017, 2016, and 2015 are as follows:

		Twelve Months Ended December 31,		
From	To	2017	2016	2015
CNY	USD	6.7 %	(6.5)%	(4.4)%
EUR	USD	13.9%	(3.1)%	(10.3)%
JPY	USD	3.9 %	2.8 %	(0.4)%
KRW	USD	13.0%	(2.5)%	(6.6)%
TWD	USD	8.8 %	1.8 %	(3.8)%
GBP	USD	9.3 %	(16.2)%	(5.5)%
CAD	USD	7.1 %	2.9 %	(16.1)%
CHF	USD	4.4 %	(1.6)%	(0.9)%
INR	USD	6.5 %	(2.5)%	(4.6)%
SGD	USD	8.2 %	(2.0)%	(6.6)%

Off Balance Sheet Arrangements

We have no off-balance sheet arrangements or variable interest entities.

Contractual Obligations

The following table sets forth our future payments due under contractual obligations as of December 31, 2017:

	Total	Less than 1 year	1 -3 years	4-5 years	More than 5 years
Operating lease obligations	$28,355	$7,109	$12,183	$ 5,477	$3,586
Purchase obligations	142,125	142,125	—	—	—
Income tax obligations	14,627	1,170	2,340	2,340	8,777
Pension funding commitment	23,162	877	1,754	1,754	18,777
Total	$207,633	$151,230	$16,175	$ 9,469	$30,759

Purchase obligations include firm commitments and agreements with various suppliers to ensure the availability of components. For more information see Note 15. Commitments and Contingencies in Item 8 "Financial Statements and Supplementary Data." Income tax obligations are a result of the 2017 Tax Cuts and Jobs Act and includes a transition tax on unremitted foreign earnings and profits, of which we have elected to pay the estimated amount over an eight-year period. For more information see Note 4. Income Taxes in Item 8 "Financial Statements and Supplementary

Data."

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Recent Accounting Pronouncements

From time to time, the Financial Accounting Standards Board (“FASB”) or other standards setting bodies issue new accounting pronouncements. Updates to the FASB Accounting Standards Codification (“ASC”) are communicated through issuance of an Accounting Standards Update (“ASU”). Unless otherwise discussed, we believe that the impact of recently issued guidance, whether adopted or to be adopted in the future, is not expected to have a material impact on our Consolidated Financial Statements upon adoption.

To understand the impact of recently issued guidance, whether adopted or to be adopted, please review the information provided in Note 1. Operations and Summary of Significant Accounting Policies and Estimates in Item 8 "Financial Statements and Supplementary Data."

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market Risk and Risk Management

In the normal course of business, we have exposures to interest rate risk from our investments, credit facility, and foreign exchange rate risk related to our foreign operations and foreign currency transactions.

Interest Rate Risk

Our market risk exposure relates to changes in interest rates in our investment portfolio and credit facility. We generally place our investments with high-credit quality issuers and by policy are averse to principal loss and seek to protect and preserve our invested funds by limiting default risk, market risk, and reinvestment risk.

As of December 31, 2017, our investments consisted primarily of certificates of deposit with maturity of less than 1 years. As a measurement of the sensitivity of our portfolio and assuming that our investment portfolio balances remain constant, a hypothetical decrease of 100 basis points (1%) in interest rates would decrease annual pre-tax earnings by a nominal amount.

Foreign Currency Exchange Rate Risk

We are impacted by changes in foreign currency exchange rates through sales and purchasing transactions when we sell products and purchase materials in currencies different from the currency in which product and manufacturing costs were incurred. The functional currencies of our worldwide facilities primarily include the USD, EUR, KRW, TWD, GBP, and CNY. Our purchasing and sales activities are primarily denominated in the USD, JPY, EUR and CNY. We may be impacted by changes in the relative buying power of our customers, which may impact sales volumes either positively or negatively. As these currencies fluctuate against each other, and other currencies, we are exposed to foreign currency exchange rate risk on sales, purchasing transactions and labor.

Acquisitions are a large component of our capital deployment strategy. A significant number of acquisition target opportunities are located outside the U.S. and their value is denominated in foreign currency. Changes in exchange rates therefore may have a material impact on their valuation in USD and therefore may impact our view of their attractiveness.

From time to time, we may enter into foreign currency exchange rate contracts to hedge against changes in foreign currency exchange rates on assets and liabilities expected to be settled at a future date, including foreign currency which may be required for a potential foreign acquisition. Market risk arises from the potential adverse effects on the value of derivative instruments that result from a change in foreign currency exchange rates. We may enter into foreign currency forward contracts to manage the exchange rate risk associated with intercompany debt denominated in nonfunctional currencies. We minimize our market risk applicable to foreign currency exchange rate contracts by establishing and monitoring parameters that limit the types and degree of our derivative contract instruments. We enter into derivative contract instruments for risk management purposes only. We do not enter into or issue derivatives for trading or speculative purposes.

Our reported financial results of operations, including the reported value of our assets and liabilities, are also impacted by changes in foreign currency exchange rates. Assets and liabilities of substantially all of our subsidiaries outside the U.S. are translated at period end rates of exchange for each reporting period. Operating results and cash flow statements are translated at weighted-average rates of exchange during each reporting period. Although these translation changes have no immediate cash impact, the translation changes may impact future borrowing capacity, and overall value of our net assets.

Currency exchange rates vary daily and often one currency strengthens against the USD while another currency weakens. Because of the complex interrelationship of the worldwide supply chains and distribution channels, it is difficult to quantify the impact of a change in one or more particular exchange rates.

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ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Shareholders
Advanced Energy Industries, Inc.
Opinion on the financial statements
We have audited the accompanying consolidated balance sheets of Advanced Energy Industries, Inc. (a Delaware corporation) and subsidiaries (the "Company") as of December 31, 2017 and 2016, the related consolidated statements of operations, comprehensive income (loss), stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2017, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2016, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2017, in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2017, based on criteria established in the 2013 Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"), and our report dated February 15, 2018 expressed an unqualified opinion.

Basis for opinion
These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ GRANT THORNTON LLP

We have served as the Company's auditor since 2004.

Denver, CO
February 15, 2018

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM (DRAFT)

Board of Directors and Shareholders
Advanced Energy Industries, Inc.

Opinion on internal control over financial reporting

We have audited the internal control over financial reporting of Advanced Energy Industries, Inc. (a Delaware corporation) and subsidiaries (the “Company”) as of December 31, 2017, based on criteria established in the 2013 Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, based on criteria established in the 2013 Internal Control-Integrated Framework issued by COSO.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (“PCAOB”), the consolidated financial statements of the Company as of and for the year ended December 31, 2017, and our report dated February 15, 2018 expressed an unqualified opinion on those financial statements.

Basis for opinion

The Company’s management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Annual Report on Internal Controls over Financial Reporting appearing under Item 9A of the Company’s Annual Report on Form 10-K. Our responsibility is to express an opinion on the Company’s internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and limitations of internal control over financial reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ GRANT THORNTON LLP
Denver, CO
February 15, 2018

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ADVANCED ENERGY INDUSTRIES, INC.
Consolidated Balance Sheets
(In thousands, except per share amounts)

	December 31, 2017	2016
ASSETS		
Current assets:		
Cash and cash equivalents	$407,283	$281,953
Marketable securities	3,104	4,737
Accounts receivable, net of allowances of $1,748 and $1,943 respectively	87,429	75,667
Inventories	78,450	55,770
Income taxes receivable	1,295	1,482
Other current assets	8,129	9,324
Current assets from discontinued operations	9,535	9,401
Total current assets	595,225	438,334
Property and equipment, net	17,795	13,337
Deposits and other	3,051	1,835
Goodwill	53,812	42,125
Intangible assets, net	33,499	28,071
Deferred income tax assets	18,841	32,197
Non-current assets from discontinued operations	11,085	15,630
TOTAL ASSETS	$733,308	$571,529
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$48,177	$46,255
Income taxes payable	5,365	1,778
Accrued payroll and employee benefits	18,412	13,230
Other accrued expenses	19,913	14,590
Customer deposits	6,402	5,774
Current liabilities from discontinued operations	7,850	13,419
Total current liabilities	106,119	95,046
Deferred income tax liabilities	4,556	1,008
Uncertain tax positions	17,031	2,538
Long-term deferred revenue	33,402	39,170
Other long-term liabilities	36,282	20,536
Non-current liabilities from discontinued operations	15,277	21,157
Total liabilities	212,667	179,455
Stockholders' equity:		
Preferred stock, $0.001 par value, 1,000 shares authorized, none issued and outstanding	—	—
Common stock, $0.001 par value, 70,000 shares authorized; 39,604 and 39,712 issued and outstanding, respectively	40	40
Additional paid-in capital	184,843	203,603
Retained earnings	333,225	195,364
Accumulated other comprehensive income (loss)	2,533	(6,933)
Total stockholders' equity	520,641	392,074
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	$733,308	$571,529

The accompanying notes are an integral part of these Consolidated Financial Statements.

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ADVANCED ENERGY INDUSTRIES, INC.
Consolidated Statements of Operations
(In thousands, except per share amounts)

	Years Ended December 31,		
	2017	2016	2015
Sales:			
Product	$578,650	$410,580	$350,834
Services	92,362	73,124	63,977
Total sales	671,012	483,704	414,811
Cost of sales:			
Product	267,587	192,694	164,889
Services	47,044	37,863	33,052
Total cost of sales	314,631	230,557	197,941
Gross profit	356,381	253,147	216,870
Operating expenses:			
Research and development	57,999	44,445	39,551
Selling, general and administrative	93,262	77,678	66,097
Amortization of intangible assets	4,350	4,167	4,368
Restructuring expense	—	—	198
Total operating expenses	155,611	126,290	110,214
Operating income	200,770	126,857	106,656
Other income (expense), net	(2,579)	1,219	(1,214)
Income from continuing operations before income taxes	198,191	128,076	105,442
Provision for income taxes	62,090	11,128	21,960
Income from continuing operations	136,101	116,948	83,482
Income (loss) from discontinued operations, net of income taxes	1,760	10,506	(241,968)
Net income (loss)	$137,861	$127,454	$(158,486)
Basic weighted-average common shares outstanding	39,754	39,720	40,746
Diluted weighted-average common shares outstanding	40,176	40,031	41,077
Earnings (loss) per share:			
Continuing operations:			
Basic earnings per share	$3.42	$2.94	$2.05
Diluted earnings per share	$3.39	$2.92	$2.03
Discontinued operations:			
Basic earnings (loss) per share	$0.04	$0.26	$(5.94)
Diluted earnings (loss) per share	$0.04	$0.26	$(5.94)
Net income:			
Basic earnings (loss) per share	$3.47	$3.21	$(3.89)
Diluted earnings (loss) per share	$3.43	$3.18	$(3.89)

The accompanying notes are an integral part of these Consolidated Financial Statements.

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ADVANCED ENERGY INDUSTRIES, INC.
Consolidated Statements of Comprehensive Income (Loss)
(In thousands)

	Years Ended December 31,		
	2017	2016	2015
Net income (loss)	$137,861	$127,454	$(158,486)
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustment	8,305	(3,631)	(10,228)
Unrealized (losses) gains on marketable securities	(2)	5	(3)
Minimum retirement benefit liability adjustment	1,163	(3,841)	(11)
Comprehensive income (loss)	$147,327	$119,987	$(168,728)

The accompanying notes are an integral part of these Consolidated Financial Statements.

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ADVANCED ENERGY INDUSTRIES, INC.
Consolidated Statements of Stockholders' Equity
(In thousands, except share amounts)

	Common Stock		Additional Paid-in	Retained	Accumulated Other Comprehensive Income			Total Stockholders'
					Translation	Unrealized gains	Minimum retirement benefit	
	Shares	Amount	Capital	Earnings	adjustment	(losses)	liability	Equity
Balances, January 1, 2015	40,613	$ 41	$ 237,752	$ 226,396	$ 10,249	$ —	$ 527	$ 474,965
Stock issued from equity plans	525	—	4,121	—	—	—	—	4,121
Stock-based compensation	—	—	3,321	—	—	—	—	3,321
Excess tax benefit from stock-based compensation	—	—	(99)	—	—	—	—	(99)
Stock buyback	(1,382)	(1)	(49,999)	—	—	—	—	(50,000)
Comprehensive income:								
Equity adjustment from foreign currency translation	—	—	—	—	(10,228)	—	—	(10,228)
Unrealized holding gains	—	—	—	—	—	(3)	—	(3)
Minimum retirement benefit liability adjustment	—	—	—	—	—	—	(11)	(11)
Net income	—	—	—	(158,486)	—	—	—	(158,486)
Total comprehensive income (loss)	—	—	—	(158,486)	(10,228)	(3)	(11)	(168,728)
Balances, December 31, 2015	39,756	$ 40	$ 195,096	$ 67,910	$ 21	$ (3)	$ 516	$ 263,580
Stock issued from equity plans	299	—	2,175	—	—	—	—	2,175
Stock-based compensation	—	—	6,332	—	—	—	—	6,332
Stock buyback	(343)	—	—	—	—	—	—	—
Comprehensive loss:								
Equity adjustment from foreign currency translation	—	—	—	—	(3,631)	—	—	(3,631)
Unrealized holding losses	—	—	—	—	—	5	—	5
Minimum retirement benefit liability adjustment	—	—	—	—	—	—	(3,841)	(3,841)
Net loss	—	—	—	127,454	—	—	—	127,454
Total comprehensive loss	—	—	—	127,454	(3,631)	5	(3,841)	119,987
Balances, December 31, 2016	39,712							