



2021 Annual Report

Powering the 4th Industrial Revolution





A Message from Our CEO

Dear Stockholders:

In 2021, we experienced an unprecedented level of demand for Advanced Energy's industry-leading power conversion and control solutions. The strong demand validates the success of our strategic focus on precision power. Despite industry-wide supply constraints limiting our ability to meet customer demand, our mitigation efforts enabled us to deliver a year of revenue growth and solid profitability.

During 2021, we took several actions to accelerate our growth and scale the company. We expanded the capabilities of our leadership team by bringing in strong and experienced leaders, including a new Chief Operations Officer. We reorganized our product development and marketing teams to increase focus and speed and to better serve our customers. Lastly, we have allocated more engineering and customer facing resources to the Semiconductor, Industrial and Medical markets, accelerating our new product introduction and design wins in these verticals.

As we look forward, we see exciting growth opportunities ahead of us. We enter the new year with record backlog and significant potential earnings power as the supply environment improves. With 70% of our revenue coming from proprietary products, we are strategically targeting long life-cycle markets with our comprehensive portfolio of power solutions. Our customers have come to rely on Advanced Energy's innovation and technical talent to solve their most challenging power delivery problems. With a strong lineup of differentiated products targeting the right markets, I believe Advanced Energy is well positioned to deliver sustained profitable growth and increasing shareholder value.

On behalf of our employees and the Board of Directors, we thank you for your continued support and confidence.

Best Regards,

A handwritten signature in blue ink that reads 'Stephen D. Kelley'.

Stephen D. Kelley
President and Chief Executive Officer

March 17, 2022

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934.

For the fiscal year ended December 31, 2021.

or

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934.

For the transition period from to

Commission file number: 000-26966



ADVANCED ENERGY INDUSTRIES, INC.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

1595 Wynkoop Street, Suite 800, Denver, Colorado
(Address of principal executive offices)

84-0846841

(I.R.S. Employer Identification No.)

80202
(Zip Code)

Registrant's telephone number, including area code: (970) 407-6626

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

<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common Stock, \$0.001 par value	AEIS	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 No

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

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

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

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

Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company Emerging growth company

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

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

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

The aggregate market value of voting and non-voting common stock held by non-affiliates of the registrant was \$4,280,072,758 as of June 30, 2021, based upon the price at which such common stock was last sold on such date.

As of March 10, 2022, there were 37,558,687 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 2022 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, 2021).

ADVANCED ENERGY INDUSTRIES, INC.
FORM 10-K
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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.

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 sales, including backlog orders;
- our ability to be successful in the design win process with our customers;
- 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 materials;
- sufficiency and availability of capital resources;
- capital expenditures;
- our production and factory strategy;
- 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;
- our estimates of the fair value of assets acquired;
- restructuring activities and expenses;
- the impact of changes in interest rates or inflation
- unanticipated costs in fulfilling our warranty obligations for solar inverters;
- 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.

Market and Industry Data

The market and industry data used in this Annual Report on Form 10-K are based on independent industry publications, customers, trade or business organizations, reports by market research firms and other published statistical information from third parties, as well as information based on management's good faith estimates, which we derive from our review of internal information and independent sources. Although we believe these sources to be reliable, we have not independently verified the accuracy or completeness of the information.

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, refine, and modify the raw electrical power coming from either the utility or the building facility and convert it into various types of highly controllable, usable power that is predictable, repeatable, and customizable to meet the necessary requirements for powering a wide range of complex equipment. Our power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition, high and low voltage applications such as semiconductor process control, data center computing, networking, telecommunication, medical equipment, life science applications, industrial technology and production, scientific instruments, clean technology production, advanced material production and temperature-critical thermal. We also supply related sensing, controls, and instrumentation products for advanced measurement and calibration of radio frequency ("RF") power and temperature, and electrostatic instrumentation products for test and measurement applications. Our network of global service support centers provides a recurring revenue opportunity as we offer repair services, conversions, upgrades, refurbishments, and used equipment to companies using our products.

Our products are sold into the Semiconductor Equipment, Industrial and Medical, Data Center Computing, and Telecom and Networking markets, and we provide revenue data by market vertical to enable tracking of trends. Advanced Energy is organized on a global, functional basis and operates in a single segment structure for power electronics conversion products.

At the beginning of 2020 we saw the spread of COVID-19, which grew into a global pandemic. Our focus on providing a healthy and safe working environment for our employees led to intermittent shutdowns of our manufacturing facilities to implement new health and safety protocols and additional investments to comply with government guidelines. During 2020 and 2021 there were periods when some of our manufacturing facilities were not operating or were operating at reduced capacity due to government mandates to restrict travel, maintain social distancing, and implement health and safety procedures. Additionally, during 2021, ongoing restrictions related to COVID-19 and disruptions in an already challenged global supply chain limited the availability of certain materials, parts, subcomponents, and subassemblies needed for production, impacting our ability to ship product to meet customer demand and contributing to increased backlog. The shortage of critical components was caused in part by the pandemic-driven rise in consumer demand for technology goods, increased demand for electronic components used in a wide variety of industries, logistics-related disruptions in shipping, capacity limitations at some suppliers due to COVID-19, its variants, labor shortages, and other factors. We expect the challenges associated with this environment to continue into 2022.

Although COVID-19 impacted our revenues and manufacturing efficiency over the last two years, COVID-19 has not materially impacted our liquidity, our ability to access capital, our ability to comply with our debt covenants or the fair value of our assets. Additionally, we believe the accommodations we have made to our work environment, including employees utilizing work-from-home arrangements where necessary, will not impact our ability to maintain effective internal controls over financial reporting.

Looking forward, we expect that customer demand in 2022 will remain strong across our served markets; however, our ability to procure critical components to meet our customers' needs will continue to be limited by the ongoing constraints in the global supply chain. These supply constraints have led to longer lead times in procuring materials and subcomponents and, in some cases, higher costs and inventory level requirements. We have implemented measures to improve supply of critical materials and components and to mitigate the impact of higher input costs and believe that our higher levels of inventory are well matched to meet our shippable customer demand. However, it is not clear how long this supply chain condition will continue, how quickly it may recover, or the extent to which our mitigating actions will be able to improve supply or to compensate for our higher costs. As such, our forward-looking projections of revenues, earnings, and cash flow may be adversely impacted if the situation continues or further deteriorates. Please see the information under the caption "Risk Factors" in Item 1A of this Annual Report on Form 10-K for additional discussion on the potential impacts of the ongoing constraints in the global supply chain and COVID-19 to the future operations of our business.

We incorporated in Colorado in 1981 and reincorporated in Delaware in 1995. Our executive offices are located at 1595 Wynkoop Street, Suite 800, Denver, Colorado 80202, and our telephone number is (970) 407-6555.

Recent Acquisitions

On June 1, 2021, we acquired 100% of the issued and outstanding shares of capital stock of TEGAM, Inc., which is based in Geneva, Ohio. This acquisition added metrology and calibration instrumentation to Advanced Energy's RF process power solutions in our Semiconductor and Industrial and Medical markets.

On December 31, 2020, we acquired 100% of the issued and outstanding shares of capital stock of Versatile Power, Inc., which is based in Campbell, California. This acquisition added RF and programmable power supplies for medical and industrial applications to our product portfolio and further expands our presence in the medical market by adding proven technologies, deep customer relationships, expertise in medical design, and a medical-certified manufacturing center.

In September 2019, we completed the acquisition of Artesyn Embedded Technologies, Inc.'s embedded power business ("Artesyn"), which was one of the world's largest providers of highly engineered, application-specific AC-DC and DC-DC power supplies for demanding applications. This acquisition diversified our product portfolio and gave us access to attractive growth markets, including data centers (including hyperscale), telecom infrastructure in next generation 5G networks, embedded industrial power applications and medical diagnostic and treatment applications.

For additional information, see *Note 2. Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data."

Products and Services

PRODUCTS

Our precision power products and solutions are designed to enable new process technologies, improve productivity, lower the cost of ownership, and provide critical power capabilities for our customers. These products are designed to meet our customers' demanding requirements in efficiency, flexibility, performance, and reliability. We also provide repair and maintenance services for our products.

We principally serve global original equipment manufacturers ("OEM") and end customers in a wide range of semiconductor and industrial technology applications with a broad range of advanced and embedded power products. Our advanced power products include plasma power solutions, high voltage power systems, power control modules, temperature and other sensing solutions that are designed to deliver precise power, control and measurement of processes used in a diverse set of applications in semiconductor device manufacturing, thin film deposition of advanced materials, thermal power control, and instrumentation. Our embedded power products include a wide range of high and low voltage, AC-DC, DC-DC, and board mounted power ("BMP") solutions designed to provide stable and efficient power in mission critical applications across a variety of industrial technology applications such as telecommunication and networking equipment, data center servers and storage systems, medical equipment, robotics, motion control and test and measurement equipment.

Our plasma power solutions include RF power supplies, RF matching networks, RF instrumentation, direct current ("DC") power systems, pulsed DC power systems, low frequency alternating current ("AC") power systems, and remote plasma sources for reactive gas applications. These solutions are used in a wide range of thin film processes across multiple semiconductor applications, including plasma-based dry etch, dry strip, atomic layer etch, atomic layer deposition, chemical vapor deposition, physical vapor deposition, electro-chemical deposition, and ion implementation. In addition, these solutions are used in the processing of advanced materials in adjacent industries such as flat panel display, solar cell manufacturing, architectural glass coating, thin film coating, optical coating, and hard coatings.

Our power control modules and thermal instrumentation products are used in the semiconductor and adjacent industries, in which time-temperature cycles affect material properties, productivity, and yield. These products are used in processes such as rapid thermal processing, chemical vapor deposition, epitaxy, and crystal growing, which require non-contact temperature measurement. They are also used in many industrial production applications for chemical processing, the manufacturing of metal, carbon fiber, and glass, as well as numerous other industrial power applications.

Our RF power, micro-ohm, and temperature metrology instruments and calibration systems are used to make critical measurements and calibrate customer hardware with speed and high accuracy in a wide range of applications, such as semiconductor manufacturing, medical, aerospace, and food processing industries.

Our embedded power products are designed to maximize energy conversion efficiency, minimize physical sizes, and to meet a variety of standards, such as IEC 60601-1 for medical equipment or IEC 60950-1 for information technology equipment. Our lower power RF power supplies are designed into medical and surgical equipment for a range of therapeutic applications. Our low-voltage AC-DC and DC-DC power supplies are used in a wide variety of end markets such as data center computing, telecom, networking, medical equipment, and broad industrial electronics. These products feature industry leading efficiency and density, to maximize performance, lower energy costs, and minimize the form factor. These products target applications where energy usage is high, such as data centers, but also applications that require a highly reliable and rugged design for use in demanding climate conditions, such as a wireless cellular tower.

Our high and lower voltage DC-DC products are designed to meet the demanding requirements of OEMs worldwide. Our DC-DC solutions and custom-built power conversion products offer high and low 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 high voltage power systems and high voltage DC-DC products target applications including semiconductor wafer processing and metrology, electrostatic clamping of substrates, scientific instrumentation, mass spectrometry, and x-ray systems for industrial and analytical applications. The low voltage DC-DC board mounted solutions are designed for a wide range of industrial applications such as healthcare, telecommunications, test and measurement, instrumentation, industrial equipment and distributed power in server and storage systems. Our programmable DC power supplies provide accurate power delivery and measurement for use in a wide range of test and measurement as well as scientific research applications.

PowerInsight, our big data analytics solution, transforms the data acquired from our power delivery systems into useable insights, through a combination of enhanced data sets and advanced analytics. These capabilities allow our customers to maximize performance, reduce costs and improve yield in their manufacturing processes.

GLOBAL SUPPORT

Our global support services group offers in-warranty and out-of-warranty repair services in the regions in which we operate, providing us with revenue opportunities from repair, upgrades and retrofit offerings to our installed base. Our customers wish to lower the cost of ownership of their capital equipment and are increasingly sensitive to the significant costs of system downtime. They expect suppliers to offer comprehensive local repair service and customer support. In addition to product repairs our customers look for upgrade and retrofit offerings to extend the useable life of their capital equipment for additional technology generations. To meet these market requirements, we maintain a worldwide support organization in ten countries, including the United States ("U.S."), the People's Republic of China ("PRC"), Japan, Korea, Taiwan, Germany, Ireland, Singapore, Israel, and Great Britain. Support services include warranty and non-warranty repair services, upgrades, and refurbishments on the products we sell.

As of December 31, 2015, we discontinued the production, engineering, and sales of our solar inverter product line, which represented 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. 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. In May 2019, we divested the U.S. central inverter repair and support business to Bold Renewables. See *Note 4. Disposed and Discontinued Operations* in Part II, Item 8 "Financial Statements and Supplementary Data."

Markets

Our products compete in markets for high tech applications using capital equipment. The majority of our markets are not generally subject to significant seasonality; however, these markets are cyclical due to 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. 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. For more information related to the markets in which we compete and the current environment in those markets, see *Business Environment and Trends* in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

SEMICONDUCTOR EQUIPMENT MARKET

Growth in the Semiconductor Equipment market is driven by increasing integrated circuit content across many industries, higher demand for processing and storage in advanced applications such as artificial intelligence, cloud computing, and autonomous vehicles, and the rapid adoption of advanced mobile connectivity solutions, such as 5G, which enhances existing and enables new wireless applications. To address the long-term growing demand for semiconductor devices, the industry continues to invest in production capacities for both leading-edge and trailing-edge nodes, logic devices, the latest memory devices including 3D-NAND, DRAM, and new emerging memories such as MRAM, and back-end test and advanced wafer-level packaging. The industry's transition to advanced technology nodes in logic and DRAM and to increased layers in 3D-NAND memory devices require an increased number of plasma-based etch and deposition process tools and higher content of our advanced power solutions per tool. As etching and deposition processes become more challenging due to increasing aspect ratios in advanced 3D devices, more advanced RF, and DC technologies are needed. We are meeting these challenges by providing a broader range of more complex RF and DC power solutions. Beyond etch and deposition processes, the growing complexity at the advanced nodes also drive a higher number of other processes across the wafer fab, including inspection, metrology, thermal, ion implantation, and semiconductor test, where Advanced Energy actively participates as a critical technology provider. In addition, our global support services group offers comprehensive local repair service, upgrade, and retrofit offerings to extend the useable life of our customers' capital equipment for additional technology generations. The acquisition of Artesyn in September 2019 expanded our reach within the Semiconductor Equipment market by adding a broad range of low voltage applications as well as back-end test and assembly equipment customers.

INDUSTRIAL AND MEDICAL MARKET

Customers in the Industrial and Medical market incorporate our advanced power, embedded power, and measurement products into a wide variety of equipment used in applications such as advanced material processing, industrial production, medical devices, life science equipment, scientific analytical instrumentation, clean technology production, and a variety of industrial technology applications such as robotics, horticulture, motor drives, and connected light-emitting diodes. The acquisition of Artesyn in September 2019 substantially expanded Advanced Energy's portfolio of products and opportunities in the Industrial and Medical market.

OEM customers design equipment utilizing our advanced material process power technologies in a variety of industrial production applications including glass coating, glass manufacturing, flat panel displays, photovoltaics solar cell manufacturing, and similar thin film manufacturing, including data storage and decorative, hard and optical coatings. These applications employ similar technologies to those used in the Semiconductor Equipment market to deposit films on non-semiconductor substrates. Our strategy around these applications is to leverage our thin film deposition technologies into an expanded set of new materials and applications in adjacent markets.

Advanced Energy also serves the Industrial and Medical market with mission-critical power components that deliver high reliability, precise, low noise or differentiated power to the equipment they serve. Examples of products sold into the Industrial and Medical market includes high voltage products for analytical instrumentation, medical equipment, low voltage power supplies used in applications for medical devices, test and measurement, medical lasers, scientific instrumentation and industrial equipment, and power control modules and thermal instrumentation products for material fabrication, processing, and treatment. Our gas monitoring products serve multiple applications in the energy market, air quality monitoring, and automobile emission monitoring and testing. Our strategy in the Industrial and Medical market is to grow and expand our addressable market both organically through our global distribution channels and through acquisitions of products and technologies that are complimentary and adjacent to our core power conversion applications.

DATA CENTER COMPUTING MARKET

Following the acquisition of Artesyn in September 2019, Advanced Energy entered the Data Center Computing market with industry leading power conversion products and technologies, which we sell to original equipment manufacturers ("OEMs") and original design manufacturers ("ODMs") of data center server and storage systems, as well as cloud service providers and their partners. Driven by the growing adoption of cloud computing, market demand for server and storage equipment has shifted from enterprise on-premises computing to the data center, driving investments in data center infrastructure.

The data center industry has started to transition to 48 Volt infrastructure, where 48 Volt DC power replaces 12 Volt in server racks in order to improve overall power efficiency. Advanced Energy benefits from these trends by leading the industry in providing 48 V server power solutions to the data center industry. Further, demand for edge computing is growing, driven by the need for faster processing, lower latency, higher data security, and more reliability than traditional cloud computing. With its wide range of many unique configurations and requirements, edge computing creates additional opportunities for Advanced Energy. Lastly, the rapid growth and adoption of Artificial Intelligence and machine learning is driving accelerated demand for server and storage racks with increased power density and higher efficiency, which plays well to Advanced Energy's strengths. With a growing presence at both cloud service providers and industry leading data center server and storage vendors, we believe Advanced Energy is well positioned to continue to capitalize on the ongoing shift towards cloud computing.

TELECOM AND NETWORKING MARKET

The acquisition of Artesyn in September 2019 provided Advanced Energy with a portfolio of products and technologies that are used across the Telecom and Networking market. Our customers include many leading vendors of wireless infrastructure equipment, telecommunication equipment and computer networking. The wireless telecom market continues to evolve with more advanced mobile standards. 5G wireless technology promises to drive substantial growth opportunities for the telecom industry as it enables new advanced applications such as autonomous vehicles and

virtual/augmented reality. Telecom service providers have started to invest in 5G, and this trend is expected to drive demand of our products into the Telecom and Networking market. In datacom, demand is driven by networking investments by telecom service providers and enterprises upgrading their network, as well as cloud service providers and data centers investing in their networks for increased bandwidth.

Customers

Our products are sold worldwide to OEMs, integrators, distributors and directly to end users. The following table summarizes the percentage of our total sales derived from our ten largest customers:

	Years Ended December 31,		
	2021	2020	2019
Ten largest customers	58.3 %	58.0 %	57.3 %

The following table summarizes sales to and percentage of total sales to our two largest customers (in thousands):

	Years Ended December 31,					
	2021		2020		2019	
Applied Materials, Inc.	\$ 296,369	20.4 %	\$ 248,350	17.5 %	\$ 164,724	20.9 %
Lam Research Corporation	147,385	10.1 %	141,778	10.0 %	88,251	11.2 %

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. The loss of a large customer could have a material adverse effect on our results of operations.

Backlog

The following table summarizes our backlog:

	December 31,	December 31,	Change	
	2021	2020	Dollar	Percent
Backlog	\$ 927,810	\$ 290,681	\$ 637,129	219.2 %

Backlog orders are firm orders scheduled to be filled and shipped in the next 12 months. Backlog increased year over year based on strong demand across our portfolio, particularly in our Semiconductor and Industrial & Medical markets, combined with supply chain shortages for critical components which limited our revenues. Backlog orders are not necessarily an indicator of future sales levels because of variations in lead times and the significance of customer production demand pull systems to our business, which are not reflected in orders or backlog.

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."

Marketing, Sales and Distribution

We sell our products through direct and indirect sales channels. Our sales operations are primarily located in the U.S., the PRC, the United Kingdom, Germany, Israel, Japan, South Korea, India, Singapore, Philippines, Hong Kong, Ireland, and Taiwan. In addition to a direct sales force, we have independent sales representatives, channel partners 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 sales by geographic region. Sales are attributed to individual countries based on customer location (in thousands).

	Years Ended December 31,					
	2021		2020		2019	
United States	\$ 561,312	38.5 %	\$ 530,965	37.5 %	\$ 321,869	40.8 %
North America (excluding U.S.)	104,167	7.2	156,856	11.1	51,765	6.6
Asia	597,830	41.1	606,893	42.9	295,155	37.4
Europe	179,056	12.3	117,989	8.3	119,427	15.1
Other	13,589	0.9	3,123	0.2	732	0.1
Total	<u>\$ 1,455,954</u>	<u>100.0 %</u>	<u>\$ 1,415,826</u>	<u>100.0 %</u>	<u>\$ 788,948</u>	<u>100.0 %</u>

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

Manufacturing

The manufacturing of our products is primarily performed at our major sites in the PRC, Philippines, and Malaysia. In addition, we perform limited specialty manufacturing for some of our products in the U.S., United Kingdom, Germany, and Denmark. See Item 1A, "Risk Factors" for a discussion of certain risks related to our manufacturing operations.

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. During 2020 and 2021, COVID-19 impacted the availability of materials, parts, and subcomponents needed for production. In some cases, we paid premiums or expedite fees to obtain critical parts to meet urgent customer needs. In many instances, we passed these additional costs along to our customers. We expect the related supply chain challenges will continue into 2022. However, we seek to reduce costs, lower the risks of production and service interruptions, and mitigate key parts shortages 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 customers' processes. The qualification process for our process power products, particularly as it pertains to semiconductor customers, follows semiconductor industry standard practices, such as "copy exact";
- monitoring the financial condition and overall performance 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 where possible 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 325 U.S. issued patents and 419 foreign issued patents, and we have 429 patent applications pending in the U.S., Europe, and Asia. Most patents are active for 20 years, and our patents expire on various dates through 2040. A substantial majority of our patents are related to our process power products and solutions 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. We leverage our proprietary technology and trade secrets to deliver on our strategy of selling differentiated products for our most important customer solutions.

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. We face a wide variety of competitors, and 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 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. Competitors in each of our market verticals include, but are not limited to, the following:

<u>Semiconductor Equipment</u>	<u>Industrial and Medical</u>	<u>Data Center Computing</u>	<u>Telecom and Networking</u>
COMET Holding AG.	Cosel Co., Ltd.	Acbel Polytech Inc.	ABB Ltd.
Daihen Corp.	Delta Electronics, Inc.	Delta Electronics, Inc.	Delta Electronics, Inc.
Kyosan Electric Mfg. Co., Ltd.	MEAN WELL Enterprises	Flex Ltd.	Lite-On Technology Corp.
MKS Instruments, Inc.	TDK-Lambda Americas Inc.	Lite-On Technology Corp.	Murata Manufacturing
TRUMPF Hüttinger GmbH + Co. KG	TRUMPF Hüttinger GmbH + Co. KG	Vicor Corporation	Vapel
	XP Power Ltd.		

In addition, 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 compete successfully in these markets depends on our ability to make timely introduction of new products and enhancements to existing products, to localize these development and production activities in key world regions close to our customers, and to produce high 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

We perform research and development ("R&D") of products to develop new or emerging applications, technological advances 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 and related software 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.

The following table summarizes research and development expenses and the percentage of these expenses as compared to total sales (in thousands):

	Years Ended December 31,		
	2021	2020	2019
Research and Development Expenses	\$ 161,831	\$ 143,961	\$ 101,503
% of Sales	11.1%	10.2%	12.9%

Employees

As of December 31, 2021, we had approximately 10,000 employees. Our employees are not represented by unions, except for statutory organization rights applicable to our employees in the PRC and in Germany. We believe that our continued success depends, in part, on our ability to attract and retain qualified personnel. We recognize that our employees are critical to our ongoing success and endeavor to maintain positive relationships with our employees at all levels. We have a global diverse workforce with employees located in more than 24 countries across the globe and representative of many different cultural, racial, ethnic, and religious backgrounds. See Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" for a discussion of our human capital resources. Advanced Energy encourages diversity and recognizes that each person's background, experiences, and unique skill set are fundamental contributors to our success. As part of our efforts to promote diversity and develop emerging talent in STEM (science, technology, engineering, and mathematics), we launched the Advanced Energy STEM Diversity Scholarship Program in 2020 to provide college students with tuition assistance, mentoring, and internship opportunities.

Environmental Matters

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.

Advanced Energy is dedicated to reducing the impact of manufacturing and procurement activities on the environment by reducing waste in our operations and improving the energy efficiency of our global factories. Our factories in PRC and the Philippines monitor greenhouse gas emissions and report to the CDP, an international non-profit organization that helps companies disclose their environmental impact. We also strive to reduce our customers' emissions as we develop and deliver increasingly efficient power-delivery products in our customers' applications. We adhere to responsible minerals sourcing and commit to the social, environmental, and ethical standards set out in the Responsible Business Alliance Code of Conduct.

Available Information

Our website address is www.advancedenergy.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.

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 material 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.

COVID-19, natural disasters, and related risks

COVID-19 could further materially adversely affect our business, workforce, supply chain, results of operations, financial condition and/or cash flows.

The ongoing COVID-19 pandemic has adversely impacted our ability (a) to manufacture, test, service and ship our products, (b) to get required materials and sub-assemblies to build and service our products and (c) to staff labor and management for manufacturing, research and development, supply chain, service, and administrative operations. Further, we may continue to experience adverse impact with our global supply chain partners, critical subassembly suppliers, parts distributors, and transportation service providers, which may result in increased costs, material shortages, and the inability to fully meet our customers' demand. For example, in 2021, the combination of increased demand for semiconductor and other select components and the ongoing impact of COVID-19 has affected global electronics markets and impacted our ability to ship to our full demand levels. In addition, we have experienced higher input costs as we have incurred material premiums, expedite fees, price increases, and higher logistic costs. We expect these conditions will continue to adversely impact our ability to ship products to customers. Beyond 2021, it is not known how long or significant these global supply strain constraints will be, but it may continue to impact our results. Further foreign and domestic government actions restricting travel, commerce, and gathering could adversely affect our manufacturing locations. COVID-19 has also resulted in economic recessions and high unemployment in many countries, which could negatively impact future customer purchases of our products. In addition, a portion of our workforce continues to work remotely. While we have been successful in transitioning to this remote environment, the long-term impact on productivity and innovation is not yet clear. As a result, COVID-19 and its variants could continue to adversely impact our near-term and long-term revenues, earnings and cash flow and could require further expenditures. The COVID-19 situation continues to evolve and to the extent that it adversely affects our business, financial condition, operating results, and cash flows, it may also have the effect of heightening many of the other risks described in this "Risk Factors" section. Other impacts may arise that we are not aware of currently. We have an active rapid response team to mitigate risks we are aware of currently and as they arise.

Our orders of raw materials, parts, components, and subassemblies are based on demand forecasts and may be constrained by supply shortages caused by COVID-19 or other factors.

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.

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. Orders with our suppliers cannot always be amended in response. In addition, 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 number 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, 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 exceeds our customers' and our forecasts, we may not be able to timely obtain enough raw materials, parts, components, or subassemblies, on favorable terms or at all, to fulfill the excess demand. This may lead to customers cancelling orders prior to shipment causing a decrease in sales, which may have a material adverse effect on our business and results of operations. In addition, given the proprietary nature of our products, many of these parts are sole sourced or not easily interchangeable. For example, in 2021 there was a global shortage of certain electronics and semiconductor parts given the emerging higher global demand for technology goods and the impact of COVID-19 and other disruptions on the global supply chain. This has resulted in higher levels of inventory while we procure critical parts to complete full kits. If we are not able to obtain parts in a reasonable timeframe and at a reasonable cost our business may be adversely impacted. Further, if demand for our products does not continue at current levels, we might not be able to use all 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.

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.

Industry related risks

Our operations in the People's Republic of China and the Asia Pacific region 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 People's Republic of China ("PRC"), which exposes us to risks, such as exchange controls and currency restrictions, changes in local economic conditions, changes in customs regulations and tariffs, 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. At various times during recent years, the U.S. and PRC have had significant disagreements over geopolitical, trade and economic issues. Controversies may arise in the future between these two countries. Any escalating political controversies between the U.S. and PRC, whether or not directly related to our business, could 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.

Additionally, there is inherent risk, based on the complex relationships among PRC, Hong Kong, Taiwan, and the United States, that political, diplomatic, and national security influences might lead to trade, technology, or capital disputes, and/or disruptions, in particular those affecting the semiconductor industry. This would adversely affect our business with PRC, Hong Kong, and/or Taiwan and perhaps the entire Asia Pacific region or global economy.

Actions by the Chinese government extending its territorial claims, such as the passage of the national security law in Hong Kong and the potential establishment of an Air Defense Identification Zone over the South China Sea,

raises the fear of conflict that could result in international reprisal. Actions by the U.S. government on trade policy against the PRC and companies like Huawei Technologies Co., Ltd. have also escalated tensions. Lastly, the recent U.S. and PRC consulate closures and the continuing Hong Kong political unrest is creating more uncertainty. Should the PRC take any actions against Taiwan, we could see additional risks to diplomatic and trade relations that could inhibit our access to materials, parts, and customers and impair our ability to effectively operate in the region. Given our expanded presence in the PRC and Hong Kong, our business results, operations, and financial condition could be adversely affected by these developments and other changes to political, diplomatic, and social conditions. Moreover, PRC's policies towards, and treatment of, U.S. companies operating in PRC and Hong Kong could change quickly resulting in an adverse impact to us.

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

As a supplier to the global semiconductor equipment, telecom, networking, data center computing, industrial, and medical industries, we are subject to business cycles, the timing, length, and volatility of which can be difficult to predict. Certain of 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. 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 enough manufacturing capacity and inventory to fulfill customer orders, effectively manage our supply chain, and attract, retain, and motivate enough 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. For example, following record levels of demand in the first half of 2018, the Semiconductor Equipment market experienced a decline, and, as a result, Advanced Energy's revenue from the Semiconductor Equipment market declined 24.5% during 2019, as compared to 2018. Although the Semiconductor Equipment market improved during the fourth quarter of 2019 and throughout 2021, it is unclear how long this recovery will last. In addition, our Data Center Computing and Telecom and Networking markets are characterized by large program investments, which can cause variations in quarterly or annual revenues. For example, during 2020 our growth in Data Center Computing and Telecom and Networking was driven by share gains at specific customer accounts. Towards the end of 2020, we began to experience a period of digestion by our major customers that continued into early 2021, resulting in lower demand. We expect overall demand levels may continue to fluctuate each quarter through these business cycles. In 2021, demand was strong across our markets, however industry wide supply constraints for certain integrated circuit and other parts limited our ability to ship to our demand levels and resulted in increased cost as we procured material through open market and other purchases. It is unclear how long it will take before the supply chain environment improves, further impacting our financial results.

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 customer 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. Increasingly, we are required to accelerate our investment in research and development to meet time-to-market, performance and technology adoption cycle needs of our customers simply to compete for design wins. Given such up-front investments we make to develop, evaluate, and qualify products in the design win process, our success and future growth depend 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. If existing or new customers do not choose us during the design win process, our market share will be reduced, the potential revenues related to the lifespan of our customers' products, which can be five to ten years, will not be realized, and our business, financial condition and results of operations would be materially and adversely impacted.

Business model and capital structure related risks

Despite the continued evolution of our manufacturing footprint our product lines are manufactured at only a few sites and our sites are not generally interchangeable.

Our power products for the semiconductor industry are manufactured in Shenzhen, PRC and Penang, Malaysia. Our high voltage products are manufactured in Ronkonkoma and Lockport, New York, Littlehampton, United Kingdom and Shenzhen, PRC. Our thermal instrumentation products are manufactured in Vancouver, Washington, Littlehampton, United Kingdom and Frankfurt, Germany. Our pyrometry solutions are manufactured in Ballerup, Denmark, Frankfurt, Germany, Magdeburg, Germany and Vancouver, Washington. Our telecom, networking, data center computing, and medical products are manufactured in Zhongshan, PRC, Rosario, Philippines and Santa Rosa, Philippines. Most facilities are under operating leases 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 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 or disrupt our productivity at such site and could prevent us from meeting our customers' requirements in a timely manner, or at all.

Additionally, we have a plan to complete the relocation of our Shenzhen, PRC manufacturing facility in 2022. As a result, we have invested in a dual manufacturing facility in Penang, Malaysia capable of manufacturing our semiconductor and other products. We believe this investment will help to mitigate our exposure to regional risks, improve our business continuity profile and lower costs over time. We opened this facility in 2020; however, it may take additional time to realize the facility's full production capacity given the impact of COVID-19 and supply chain constraints. As this facility increases its volume capabilities, we may experience production inefficiencies, challenges related to material flow and workmanship, or other issues customary to ramping a new factory. If we are not able to fully and timely integrate our facility, our revenues may be negatively impacted until we are able to increase capacity or productivity.

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

We transitioned the purchasing of a substantial portion of components for our 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.

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. Our customers continually exert pressure on us to reduce our prices and extend payment terms and we may be required to enter into long term reduced pricing agreements, extended payment terms, exclusivity arrangements, or other unfavorable contract terms with our largest customers to remain competitive. In addition, we compete in markets in which customers may include dual or multi-sourcing of power. We believe some of our Asian competitors benefit from local governmental funding incentives and purchasing preferences from end-user customers in their respective countries. 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, product offerings and product costs accordingly, and if we are unable to do so, our business, financial condition, and results of operations could be materially and adversely affected. Further, in 2021 we increased prices and implemented surcharges across many of our products to reflect our higher supply chain costs. Although these price changes have been accepted by our customers, the higher prices could make our products less competitive in the market over time and could have an adverse effect on our results of operations.

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

The following table summarizes the percentage of total sales derived from our ten largest customers:

	Years Ended December 31,		
	2021	2020	2019
Ten largest customers	58.3 %	58.0 %	57.3 %

The following table summarizes sales to and percentage of total sales from our two largest customers (in thousands):

	Years Ended December 31,					
	2021		2020		2019	
Applied Materials, Inc.	\$ 296,369	20.4 %	\$ 248,350	17.5 %	\$ 164,724	20.9 %
Lam Research Corporation	147,385	10.1 %	141,778	10.0 %	88,251	11.2 %

The following table summarizes the accounts receivable balances (in thousands) and percentages of the total accounts receivable from customers who individually accounted for 10% or more of accounts receivable:

	December 31,		December 31,	
	2021		2020	
Applied Materials, Inc.	\$ 42,425	17.9 %	\$ 33,402	14.2 %
Nidec Motor Corporation	*	* %	\$ 24,344	10.4 %

* Customer's balance was less than 10% of total

A significant decline in sales from these or other large customers, or our inability to collect on these sales, could materially and adversely impact our business, results of operations and financial condition.

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

Our success depends to a significant degree upon the continuing contributions of our management, technical, marketing, and sales employees. We may not be successful in retaining our employees or attracting or retaining additional skilled personnel as required. Failure to retain or attract personnel could significantly harm our results of operations and competitive position. Our success in hiring and retaining employees depends on a variety of factors, including the attractiveness of our compensation and benefit programs, global economic or political and industry conditions, our organizational structure, our reputation, culture and working environment, competition for talent and the availability of qualified employees, the availability of career development opportunities, and our ability to offer a

challenging and rewarding work environment. We must develop our personnel to provide succession plans capable of maintaining continuity during 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.

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.

Acquisition related risks

Our long-term success and results of operations depend on our ability to successfully integrate Artesyn's business and operations and realize the anticipated benefits from the acquisition.

In September 2019, we acquired Artesyn, and we are continuing to combine Artesyn's business with our business. The acquisition of Artesyn has significantly increased our embedded power product offerings, increased our exposure to the Industrial and Medical, Data Center Computing, and Telecom and Networking markets, and significantly increased the number of employees and facilities.

To realize the anticipated benefits of the acquisition, we must continue to combine our businesses in an efficient and effective manner and realize our synergy and cost-savings targets. Integrating Artesyn's business and operations with ours requires significant management attention, effort, and expenditures, and we may not be able to achieve the longer-term integration goals in an effective, complete, timely or cost-efficient manner.

Potential risks related to the successful integration of Artesyn's business include our ability to:

- maintain and improve Artesyn's financial and operating results while integrating and optimizing our combined sales, marketing, manufacturing, and corporate administrative organizations;
- optimize our combined worldwide manufacturing footprint while utilizing Artesyn's vertically integrated manufacturing model for a broader set of Company products;
- successfully eliminate fixed costs previously absorbed by other businesses prior to the transaction;
- recognize and capitalize on anticipated product sales and technology enhancement opportunities presented by our combined businesses;
- integrate our information technology systems to mitigate cyber-security risks and enable the management and operation of the combined business.

If we are unable to successfully or timely integrate the operations of Artesyn's business into our business over the long-term, we may be unable to realize the long-term revenue growth, synergies, cost-savings, and other anticipated benefits resulting from the acquisition and our business could be adversely affected. Additionally, we have and may

continue to incur transaction-related costs, including legal, regulatory, and other costs associated with implementing integration plans, including facilities and systems consolidation costs and employment-related costs. Artesyn's business and operations may not achieve the anticipated revenues and operating results. Any of the foregoing risks could materially harm our business, financial condition, and results of operations.

Our debt obligations and the restrictive covenants in the agreements governing our debt could limit our ability to operate our business or pursue our business strategies, could adversely affect our business, financial condition, results of operations, and cash flows, and could significantly reduce stockholder benefits from a change of control event.

Our debt obligations could make us more vulnerable to general adverse economic and industry conditions and could limit our flexibility in planning for, or reacting to, changes in our business and the industries in which we operate, thereby placing us at a disadvantage to our competitors that have less indebtedness.

Our debt obligations impose financial covenants on us and our subsidiaries that require us to maintain a certain leverage ratio. The financial covenants place certain restrictions on our business that may affect our ability to execute our business strategy successfully or take other actions that we believe would be in the best interests of our Company. These include limitations or restrictions, among other things, on our ability and the ability of our subsidiaries to:

- incur additional indebtedness;
- pay dividends or make distributions on our capital stock or certain other restricted payments or investments;
- make domestic and foreign investments and extend credit;
- engage in transactions with affiliates;
- transfer and sell assets;
- effect a consolidation or merger or sell, transfer, lease, or otherwise dispose of all or substantially all our assets; and
- create liens on our assets to secure debt.

Our debt obligations contain certain customary events of default. Any breach of the covenants or other event of default could cause a default on our debt obligations, which could restrict our ability to borrow under our revolving credit facility. If there were an event of default under certain provisions of our debt arrangements that was not cured or waived, the holders of the defaulted debt may be able to cause all amounts outstanding with respect to the debt instrument, plus any required settlement costs, to be due and payable immediately. Our assets and cash flow may not be sufficient to fully repay borrowings under our outstanding debt instruments if accelerated upon an event of default. If we are unable to repay, refinance, or restructure our indebtedness as required, or amend the covenants contained in these agreements, the lenders can exercise all rights and remedies available under our Credit Agreement or applicable laws or equity.

Activities necessary to integrate acquisitions may result in costs more than 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 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.

Commercial and financial related risks

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, because 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 usernames, 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 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.

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 customers or 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 by patents in several countries in which we do business, and we have limited patent protection in other countries, including the PRC. 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 are subject to risks inherent in international operations.

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 table below summarizes our sales by geographic area (in thousands). Sales to customers outside the United States represent a significant portion of our total revenue.

	Years Ended December 31,					
	2021		2020		2019	
United States	\$ 561,312	38.5 %	\$ 530,965	37.5 %	\$ 321,869	40.8 %
North America (excluding U.S.)	104,167	7.2	156,856	11.1	51,765	6.6
Asia	597,830	41.1	606,893	42.9	295,155	37.4
Europe	179,056	12.3	117,989	8.3	119,427	15.1
Other	13,589	0.9	3,123	0.2	732	0.1
Total	<u>\$ 1,455,954</u>	<u>100.0 %</u>	<u>\$ 1,415,826</u>	<u>100.0 %</u>	<u>\$ 788,948</u>	<u>100.0 %</u>

Our acquisitions 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;
- Our ability to procure parts from suppliers affected by geographic, geopolitical, pandemic, or other factors related to their local environment.
- 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 enough 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 significant balances in accounts receivable from foreign customers; and
- changes in tariffs, income tax, value added tax, 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.

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 and has negatively impacted the global demand for our products. Some of our key markets depend largely on consumer spending. Economic uncertainty exacerbates negative trends in consumer spending and may cause our customers to push out, cancel, or refrain from placing orders.

Difficulties or increased costs 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 including inflation, interest rates, availability of capital markets, consumer spending rates, energy availability and costs and the effects of government initiatives to manage 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.

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 impact of control failures in the event of non-compliance.

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 increasing claims from customers and suppliers and increasing litigation related to the legacy inverter product line. We review such claims and vigorously defend against such lawsuits in the ordinary course of our business. We cannot assure 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 income taxes" 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 they 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 4. Disposed and Discontinued Operations* in Part II, 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 (loss) from discontinued operations, net of income taxes." See *Note 4. Disposed and Discontinued Operations* in Part II, 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 operations could be materially and adversely affected. In addition, we have large, long-term liabilities such as local lease and pension liabilities in Europe and Asia creating more significant exposure to fluctuations in the value of the Euro, Philippine Peso, and Chinese Yuan. We do not attempt to hedge these exposures given the long-term nature of the underlying liabilities and the non-cash nature of the foreign exchange gain or loss.

The PRC government is continually pressured by its trading partners to allow its currency to float in a manner like other major currencies. Any change in the value of the Chinese yuan could significantly increase the labor and other costs incurred in the operation of our Shenzhen and Zhongshan facilities and the cost of raw materials, parts,

components, and subassemblies that we source in the PRC, which could materially and adversely affect our results of operations.

The United Kingdom's exit from 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 January 23, 2020, the UK left the EU, which is commonly referred to as "Brexit," and was in a transitional period through December 31, 2020. As of January 1, 2021, EU Trade Agreements no longer applied to the UK. The UK has taken steps to reproduce the effects of trading agreements that previously applied through the provisional application of new trade agreements not yet ratified and has introduced the UK Global Tariff. These changes resulted in increased regulatory complexities on imports and exports to and from the UK which may adversely affect our sales, operations, and financial results. Our operations in the UK may also be adversely affected by significant fluctuations in the UK exchange rates and increased administrative costs and tariffs on the importation of parts for manufacturing and repair services. Moreover, the imposition of import restrictions and duties levied on our UK products may make our products more expensive for such customers and less competitive from a pricing perspective.

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. The acquisition of Artesyn added additional information systems that are initially different from current systems. 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.

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 our 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. We have experienced increased litigation related to our legacy inverter product line. 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 our pension plan.

We currently have unfunded obligations to our pension plans. 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 17. Employee Retirement Plans and Postretirement Benefits* in Part II, Item 8 "Financial Statements and Supplementary Data" contained herein.

Our intangible assets may become impaired.

The following table summarizes our goodwill and intangible assets (in thousands):

	December 31, 2021
Goodwill	\$ 212,190
Intangible assets, net	159,406
Total	\$ 371,596

We periodically review the carrying value of our goodwill and the estimated useful lives of our 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.

International trade, tax, and regulatory related risks

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

U.S. government actions are imposing greater restrictions and economic disincentives on international trade. It has initiated the imposition of additional tariffs on certain foreign goods, including steel and aluminum, semiconductor manufacturing equipment and spare parts thereof and has also announced the imposition of import license requirements on aluminum articles. The government has amended and expanded export regulations regarding sales to companies on the U.S. Entity List. These changes prevent sales of foreign produced direct product of the U.S. that is manufactured using controlled U.S.-origin equipment, technology, and software located outside the United States to companies on the U.S. Entity List. Additionally, the U.S. Department of Defense continues to issue lists of companies it has determined to be owned or controlled by China’s People’s Liberation Army on which sanctions could be levied by executive order, and the Department of Commerce continues to expand the list of designated military end users from PRC and Russia for whom export licenses are now required.

Furthermore, the government has determined that the Special Administrative Region of Hong Kong is no longer sufficiently autonomous to justify being treated as separate from PRC and has eliminated certain license exceptions for the export of controlled goods to Hong Kong and has removed Hong Kong as a separate shipping destination under the Export Administration Regulations ("EAR").

In response to U.S. Government actions, PRC passed numerous regulations, including the Export Control Law of the People’s Republic of China, effective December 1, 2020, the Rules on Counteracting Unjustified Extra-territorial Application of Foreign Legislation and Other Measures promulgated on January 9, 2021, and the Anti-Foreign Sanctions Law of the People’s Republic of China, released on July 24, 2021. These laws provide the PRC government with the framework to ban exports of strategic materials and advanced technologies to specific foreign entities on its Control List, block application of foreign laws, impose its own sanctions on entities and countries and provides a counterweight to the U.S. government’s restrictions through provisions for retaliatory action and extraterritorial jurisdiction.

Changes in U.S. trade policy could result in one or more U.S. trading partners adopting responsive trade policy making it more difficult or costly for us to export our products to those countries. As indicated above, these measures could also result in increased costs for goods imported into the U.S. This in turn could require us to increase prices to our customers which may reduce demand, or, if we are unable to increase prices, result in lowering our margin on goods and

services sold. To the extent that trade tariffs and other restrictions imposed by the U.S. increase the price of semiconductor equipment and related parts imported into the U.S., the cost of our materials may be adversely affected and the demand from customers for products and services may be diminished, which could adversely affect our revenues and profitability.

The adoption and expansion of trade restrictions, the occurrence of a trade war, or other governmental action related to tariffs, trade agreements, or policies has the potential to adversely impact demand for our products, our costs, our customers, our suppliers, and the U.S. economy, which in turn could adversely impact our business, financial condition, and results of operations.

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.

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 by their nature are complex and 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. As both domestic and foreign governments contemplate or make changes in tax law to raise more revenues, our results could be negatively affected. Further, 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 several other countries are actively considering changes in this regard.

Changes in our provision for income taxes or adverse outcomes resulting from examination of our income tax returns could adversely affect our results.

Our provision for income taxes is subject to volatility and could be adversely affected by earnings being lower than anticipated in countries that have lower tax rates and higher than anticipated in countries that have higher tax rates; by changes in the valuation of our deferred tax assets and liabilities; by changes, regulations, and interpretations of foreign-derived intangible income ("FDII"), global intangible low-tax income ("GILTI") and base erosion and anti-abuse tax laws ("BEAT"); by expiration of or lapses in tax incentives; by transfer pricing adjustments, including the effect of acquisitions on our legal structure; by tax effects of nondeductible compensation; by tax costs related to intercompany realignments; by changes in accounting principles; or by changes in tax laws and regulations, treaties, or interpretations thereof, including changes to the taxation of earnings of our foreign subsidiaries, the deductibility of expenses attributable to foreign income, and the foreign tax credit rules. Significant judgment is required to determine the

recognition and measurement attribute prescribed in the accounting guidance for uncertainty in income taxes. The Organization for Economic Co-operation and Development ("OECD"), an international association comprised of 36 countries, including the United States, has made changes to numerous long-standing tax principles. There can be no assurance that these changes, once adopted by countries, will not have an adverse impact on our provision for income taxes. Further, because of certain of our ongoing employment and capital investment actions and commitments, our income in certain countries is subject to reduced tax rates. Our failure to meet these commitments could adversely impact our provision for income taxes. In addition, we are the subject of regular examination of our income tax returns by tax authorities. We regularly assess the likelihood of adverse outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. There can be no assurance that the outcomes from these continuous examinations will not have an adverse effect on our operating results and financial condition.

Our business is subject to complex and evolving U.S. and international laws and regulations regarding privacy and data protection. Many of these laws and regulations are subject to change and uncertain interpretation and could result in claims, changes to our business practices, penalties, increased cost of operations, or declines in user growth or engagement, or otherwise harm our business.

Regulatory authorities around the world have implemented or are considering several legislative and regulatory proposals concerning data protection, including measures to ensure that encryption of users' data does not hinder law enforcement agencies' access to that data. In addition, the interpretation and application of consumer and data protection laws in the U.S., Europe and elsewhere are often uncertain and in flux. It is possible that these laws may be interpreted and applied in a manner that is inconsistent with our data practices. These legislative and regulatory proposals, if adopted, and such interpretations could, in addition to the possibility of fines, result in an order requiring that we change our data practices, which could have an adverse effect on our business and results of operations. Complying with these various laws could cause us to incur substantial costs or require us to change our business practices in a manner adverse to our business.

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. In addition, with our December 31, 2020 acquisition of Versatile Power, Inc., we expanded our presence in the medical market to include more highly regulated applications and added its medical-certified manufacturing center to our operating footprint. We may encounter increased costs to maintain compliance with the quality systems and other regulations and requirements that apply to the acquired business. 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 numerous imports, exports, 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 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 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 such minerals originate from the Democratic Republic of Congo and adjoining countries. We must perform sufficient due diligence to determine whether such minerals are 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 the components of our products are certified as conflict mineral free.

General Risk Factors

Our failure to maintain appropriate environmental, social, and governance ("ESG") practices and disclosures could result in reputational harm, a loss of customer and investor confidence, and adverse business and financial results.

Governments, investors, customers, and employees are enhancing their focus on ESG practices and disclosures, and expectations in this area are rapidly evolving and increasing. While we monitor the various and evolving standards and associated reporting requirements, failure to adequately maintain appropriate ESG practices that meet diverse stakeholder expectations may result in the loss of business, diluted market valuation, an inability to attract customers, and an inability to attract and retain top talent.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Information concerning our principal properties is set forth below:

Location	Principal Activity	Ownership
Denver, Colorado	Corporate headquarters, general and administrative	Leased
Fort Collins, Colorado	Research and development, distribution, sales, and service	Leased
Lockport, New York	Manufacturing, distribution, service, and research and development	Leased
Shenzhen, China	Manufacturing, distribution, service, and research and development	Leased
Zhongshan, China	Manufacturing	Leased
Penang, Malaysia	Manufacturing and distribution	Leased
Quezon, Philippines	Engineering, research and development, administration, and support	Leased
Rosario, Philippines	Manufacturing	Owned
Santa Rosa, Philippines	Manufacturing	Leased
Taipei, Taiwan	Sales, distribution, and service	Leased
Metzingen, Germany	Distribution, sales, and service	Leased
Hong Kong, Hong Kong	Distribution and general and administrative	Leased
Singapore, Singapore	Global operations headquarters (sales, service, and research and development)	Leased

In addition to the above principal properties, we have several other facilities throughout the US, North America, Europe, and Asia. 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 and a supplier 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. For further information see *Note 19. Commitments and Contingencies* in Part II, Item 8 "Financial Statements and Supplementary Data."

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

Principal Market

Our common stock is listed on the NASDAQ Global Select Market under the symbol "AEIS." On January 31, 2022, the number of common stockholders of record was approximately 300. This does not include stockholders whose shares are held in "street name" through brokers or other nominees.

Dividend Policy

In December 2020, the Board of Directors ("the Board") approved a dividend program, pursuant to which we intend to pay a regular quarterly cash dividend of \$0.10 per share of capital stock. In March 2021, we paid the first quarterly cash dividend since our inception as a public company. During the year ended December 31, 2021, we paid cash dividends totaling \$15.4 million. Future dividend payments are subject to the Board's approval.

Purchases of Equity Securities by the Issuer

The following table summarizes actions by our Board of Directors in relation to the stock repurchase program:

<u>Date</u>	<u>Action</u>
September 2015	Authorized a program to repurchase up to \$150.0 million of our common stock
May 2018	Approved a \$50.0 million increase in the repurchase program
December 2019	Authorized the removal of the expiration date and increased the balance available for the repurchase program by \$25.1 million
July 2021	Approved an increase to the repurchase program, which authorized the Company to repurchase up to \$200.0 million with no time limitation

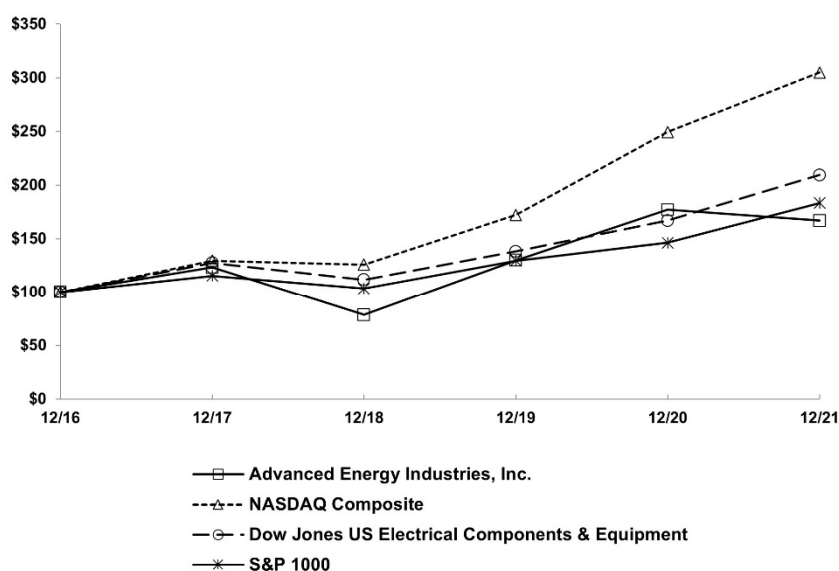
To execute the repurchase of shares of our common stock, we periodically enter into stock repurchase agreements. The following table summarizes these repurchases during the year ended December 31, 2021:

Month	Total Number of Shares Purchased	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs
	(in thousands, except price per share data)			
January	—	\$ —	—	\$ 38,369
February	—	\$ —	—	\$ 38,369
March	—	\$ —	—	\$ 38,369
First quarter	—	\$ —	—	
April	—	\$ —	—	\$ 38,369
May	72	\$ 90.34	72	\$ 31,866
June	—	\$ —	—	\$ 31,866
Second quarter	72	\$ 90.34	72	
July	8	\$ 94.34	8	\$ 199,218
August	338	\$ 86.45	338	\$ 170,002
September	259	\$ 87.32	259	\$ 147,444
Third quarter	605	\$ 85.12	605	
October	121	\$ 85.76	121	\$ 137,076
November	—	\$ —	—	\$ 137,076
December	103	\$ 84.38	103	\$ 128,377
Fourth quarter	224	\$ 85.12	224	
Total	901	\$ 86.76	901	\$ 128,377

Performance Graph

The performance graph below shows the five-year cumulative total stockholder return on our common stock in comparison to certain other indices during the period from December 31, 2016 through December 31, 2021. The comparison assumes \$100 invested on December 31, 2016 in Advanced Energy common stock and in each of the 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.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*
 Among Advanced Energy Industries, Inc., the NASDAQ Composite, the Dow Jones US Electrical Components & Equipment Index and the S&P 1000 Index



*\$100 invested on 12/31/16 in stock or index, including reinvestment of dividends. Fiscal year ending December 31.

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	December 31,					
	2016	2017	2018	2019	2020	2021
Advanced Energy Industries, Inc.	\$ 100.00	\$ 123.25	\$ 78.41	\$ 130.05	\$ 177.11	\$ 167.03
NASDAQ Composite	100.00	129.64	125.96	172.17	249.51	304.85
Dow Jones US Electrical Components & Equipment	100.00	127.46	111.82	138.30	166.99	209.33
S&P 1000	100.00	115.33	103.45	129.46	146.26	183.34

Information relating to compensation plans under which our equity securities are authorized for issuance is set forth in Part III, Item 12 "Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters" of this Annual Report on Form 10-K.

ITEM 6. RESERVED

Not applicable.

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 this Annual Report on Form 10-K for additional factors relating to such statements and see "*Risk Factors*" in Part I, Item 1A for a discussion of certain risks applicable to our business, financial condition, and results of operations.

The following section discusses our results of operations for 2021 and 2020 and year-to-year comparisons between those periods. Discussions of 2019 and year-to-year comparisons between 2020 and 2019 are not included in this Form 10-K and can be found within Part II, Item 7 "Management's Discussion and Analysis for Financial Condition and Results of Operations" in our 2020 Form 10-K for the year ended December 31, 2020.

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, refine, and modify the raw electrical power coming from either the utility or the building facility and convert it into various types of highly controllable, usable power that is predictable, repeatable, and customizable to meet the necessary requirements for powering a wide range of complex equipment. Our power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition, high and low voltage applications such as semiconductor process control, data center computing, networking, telecommunication, medical equipment, life science applications, industrial technology and production, scientific instruments, clean technology production, advanced material production and temperature-critical thermal applications. We also supply related sensing, controls, and instrumentation products for advanced measurement and calibration of RF power and temperature, electrostatic instrumentation products for test and measurement applications, and gas sensing and monitoring solutions for multiple industrial markets. Our network of global service support centers provides a recurring revenue opportunity as we offer repair services, conversions, upgrades, refurbishments, and used equipment to companies using our products.

Our products are sold into the Semiconductor Equipment, Industrial and Medical, Data Center Computing, and Telecom and Networking markets, and we have provided market revenue data in this Annual Report on Form 10-K to enable tracking of trends. Advanced Energy is organized on a global, functional basis and operates in a single segment structure for power electronics conversion products.

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 us to make judgments, assumptions, and estimates that affect the amounts reported. *Note 1. Operations and Summary of Significant Accounting Policies and Estimates* in Part II, 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.

Business Combinations

We record the assets acquired and liabilities assumed in a business combination at their acquisition date fair values. Fair values of assets acquired, and liabilities assumed are based upon available information and may involve engaging an independent third party to perform an appraisal. Estimating fair values can be complex and subject to significant business judgment. We must also identify and include in the allocation all acquired tangible and intangible assets that meet certain criteria, including assets that were not previously recorded by the acquired entity. The estimates most commonly involve property, plant and equipment and intangible assets. The estimates also include the fair value of contracts including commodity purchase and sale agreements, storage contracts, and transportation contracts. The excess

of the purchase price over the net fair value of acquired assets and assumed liabilities is recorded as goodwill, which is not amortized but instead is evaluated for impairment at least annually. Pursuant to U.S. GAAP, an entity is allowed a reasonable period of time (not to exceed one year) to obtain the information necessary to identify and measure the fair value of the assets acquired and liabilities assumed in a business combination.

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 adjust 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 5. Income Taxes* in Part II, Item 8 "Financial Statements and Supplementary Data."

Inventory

We value our inventory at the lower of cost (first-in, first-out method) or net realizable value. 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. Our industry is subject to technological change, new product developments, and changes in end-user demand for our products which can fluctuate significantly. Any significant changes in end-user demand, technology or new product developments could have a significant impact on the value of our inventory and our reported operating results.

Defined Benefit Pension Plans

Accounting for pension plans requires that we make assumptions that involve considerable judgment which are significant inputs in the actuarial models that measure our net pension obligations and ultimately impact our earnings. These include the discount rate, long-term expected rate of return on assets, compensation trends, inflation considerations, health care cost trends and other assumptions, as well as determining the fair value of assets in our funded plans. Specifically, the discount rates, as well as the expected rates of return on assets and plan asset fair value determination, are important assumptions used in determining the plans' funded status and annual net periodic pension and benefit costs. We evaluate these critical assumptions at least annually on a plan and country-specific basis. We also, with the help of actuaries, periodically evaluate other assumptions involving demographic factors, such as retirement age, mortality, and turnover, and update them to reflect our experience and expectations for the future. We believe the accounting estimates related to our pension plans are critical accounting estimates because they are highly susceptible to change from period to period based on the performance of plan assets, actuarial valuations, market conditions and contracted benefit changes. While we believe that our assumptions are appropriate, significant differences in our actual

experience or significant changes in our assumptions may materially affect our net pension and postretirement benefit obligations and related expense.

Human Capital Resources

Our corporate citizenship, social responsibility and commitment to our employees extends beyond the products we make. We conduct anonymous surveys to seek feedback from our employees on important topics related to confidence in company leadership, career growth opportunities, and improvements on how we can make our company a great place to work. In addition, we share the results of the survey with our Board. To further increase our commitment to diversity and equity, in 2020 we announced the launch of our inaugural Advanced Energy STEM Diversity Scholarship, which is aimed at developing emerging talent and promoting greater ethnic, racial and gender diversity in STEM. The annual program accepts applications from undergraduate and post-graduate students attending five leading institutions in the field of power technologies.

Total Rewards

As part of our total rewards philosophy, we believe in offering and maintaining competitive compensation and benefits programs for our employees in order to attract and retain a talented, highly engaged workforce. Our compensation programs are focused on equitable, fair pay practices including market-based base pay, an annual pay-for-performance incentive plan, and discounted employee stock purchase plan. In addition to our competitive compensation practices, we offer a strong benefits package in each of the countries in which we operate. In the majority of our non-U.S. operations, we offer additional benefits that supplement governmental statutory benefits. In the U.S., we offer a competitive benefits package that includes four different health care plan options with employee premiums lower than the market average, dental, vision, disability and life insurance, health savings and flexible spending accounts, paid time off, 8-weeks of paid parental leave for both parents, company matched 401(k) contributions, flexible work schedules, expanded mental health coverage, and employee assistance programs. With the challenging times created by COVID-19, we continued our commitment to ensure our employees maintained financial security and provided certain employees the ability to work from home, paid leave time for our employees who may have been impacted by temporary site closures, and paid leave time for vaccinations.

Learning and Development

To support our employees in reaching their full potential and to build internal capabilities, we offer a wide range of internal and external learning and development opportunities. We have a program for education assistance reimbursement that provides financial support to employees who seek to expand their skills and abilities. We also have an internship program designed to help support a talent pipeline. We have a robust succession planning process to develop internal leadership capabilities and technical bench strength, ensuring we have a strong workforce for the future.

Diversity, Equity & Inclusion

In 2021, we relaunched our Corporate Inclusion, Diversity and Equity Steering Committee, which was tasked with researching, developing, and proposing strategies and initiatives aimed at creating and fostering engagement, awareness, respect, and inclusion for our employees, customers, vendors, and communities. This committee provides global guidance and direction while enabling local activities to develop specific, targeted initiatives as appropriate.

Health and Safety

We are committed to providing a safe work environment for our employees. We provide regular health and safety training in both on-site format and through our virtual training tool that assigns training requirements based on job profiles and site-specific requirements. Our Environmental, Health and Safety organization is a global team responsible for health and safety related to on-site operations, including hazard and risk identification. Workplace safety is also addressed in operations meetings and monthly business reviews. We are also committed to the standards of the Responsible Business Alliance Code of Conduct, which promotes labor, health and safety, environmental and ethics best practices.

Community Involvement

Our charitable contributions committee, founded in 2010, is supported and led by our employees. The committee provides financial support for 501(c)(3) corporations, non-profit institutions, and organizations that improve education, the environment, health, and social services across the communities in which we operate and where our employees live. We provide financial support to workforce initiatives led by the local chamber of commerce in northern Colorado and partnered with a community college to provide equipment and funding to train technicians and develop skilled labor that may lead to employment opportunities with us or other local companies. We offer each employee eight hours of paid time off to volunteer with a 501(c)(3) organization of the employee's choosing. Our Educational Scholarship Program, available to children of Advanced Energy employees, celebrates education accomplishments and facilitates career and learning goals.

Business Environment and Trends

Advanced Energy operates in a single segment structure for power electronics conversion products. We operate in four vertical markets or applications and provide revenue information to enable tracking of market trends.

The demand environment in each of our markets is impacted by various market trends, customer buying patterns, design wins, macroeconomic and other factors. During 2021 we saw growth in our Semiconductor Equipment and Industrial and Medical markets but weakening demand in our Data Center Computing and Telecom and Networking markets.

At the beginning of 2020 we saw the spread of COVID-19, which grew into a global pandemic. Our focus on providing a healthy and safe working environment for our employees led to intermittent shutdowns of our manufacturing facilities to implement new health and safety protocols and additional investments to comply with government guidelines. During 2020 and 2021 there were periods when some of our manufacturing facilities were not operating or were operating at reduced capacity due to government mandates to restrict travel, maintain social distancing, and implement health and safety procedures. Additionally, ongoing restrictions related to COVID-19 and disruptions in an already challenged global supply chain limited the availability of certain materials, parts, subcomponents, and subassemblies needed for production during 2021, impacting our ability to ship product to meet customer demand. The shortage of critical components was caused in part by the pandemic-driven rise in consumer demand for technology goods, increased demand for electronic components used in a wide variety of industries, logistics-related disruptions in shipping, and capacity limitations at some suppliers due to COVID-19, its variants, labor shortages, and other factors. See Part I, Item 1A "Risk Factors" for a discussion of certain risks related to COVID-19.

SEMICONDUCTOR EQUIPMENT MARKET

Growth in the Semiconductor Equipment market is driven by growing integrated circuits content across many industries, increased demand for processing and storage in advanced applications such as artificial intelligence, cloud computing, and autonomous vehicles, and the rapid adoption of advanced mobile connectivity solutions such as 5G, which enhances existing and enables new wireless applications. To address the long-term growing demand for semiconductor devices, the industry continues to invest in production capacities for both leading-edge and trailing-edge nodes, logic devices, the latest memory devices including 3D-NAND, DRAM, and new emerging memories such as MRAM, and back-end test and advanced wafer-level packaging. The industry's transition to advanced technology nodes in logic and DRAM and to increased layers in 3D-NAND memory devices require an increased number of plasma-based etch and deposition process tools and higher content of our advanced power solutions per tool. As etching and deposition processes become more challenging due to increasing aspect ratios in advanced 3D devices, more advanced RF, and DC technologies are needed. We are meeting these challenges by providing a broader range of more complex RF and DC power solutions. Beyond etch and deposition processes, the growing complexity at the advanced nodes also drive a higher number of other processes across the wafer fab, including inspection, metrology, thermal, ion implantation, and semiconductor test, where Advanced Energy is actively participating as a critical technology provider. In addition, our global support services group offers comprehensive local repair service, upgrade, and retrofit offerings to extend the useable life of our customers' capital equipment for additional technology generations. The acquisition of Artesyn in September 2019 expanded Advanced Energy's reach within the Semiconductor Equipment market by adding a broad

range of low voltage applications as well as back-end test and assembly equipment makers. Our strategy in the Semiconductor Equipment market is to defend our proprietary positions in our core applications, grow our market position in applications where we have lower share, including remote plasma source and dielectric etch, and leverage our product portfolio in areas such as embedded power, high voltage power system, and critical sensing and controls to grow our share and contents at our key OEM customers.

The Semiconductor Equipment market is experiencing continued demand growth since 2019, driven by higher semiconductor contents across many industries, increased capital intensity at the leading-edge process nodes, semiconductor device makers investing in the trailing-edge nodes due to supply constraints and increased regional investments of semiconductor capacities. Advanced Energy participated in this market growth by delivering record revenue from the Semiconductor Equipment market in 2021, even with the negative impact of limited availability of critical parts due to global supply constraints. In addition, increased demand for semiconductor devices for a wide range of applications as global economies begin to recover is expected to drive investment in new capacity throughout 2022.

INDUSTRIAL AND MEDICAL MARKET

Customers in the Industrial and Medical market incorporate our advanced power, embedded power, and measurement products into a wide variety of equipment used in applications such as advanced material fabrication, medical devices, analytical instrumentation, test and measurement equipment, robotics, horticulture, motor drives, and connected light-emitting diodes.

OEM customers design equipment utilizing our process power technologies in a variety of industrial production applications including glass coating, glass manufacturing, flat panel displays, photovoltaics solar cell manufacturing, and similar thin film manufacturing, including data storage and decorative, hard and optical coatings. These applications employ similar technologies to those used in the Semiconductor Equipment market to deposit films on non-semiconductor substrates. Our strategy around these applications is to leverage our thin film deposition technologies into an expanded set of new materials and applications in adjacent markets.

Advanced Energy serves the Industrial and Medical market with mission-critical power components that deliver high reliability, precise, low noise or differentiated power to the equipment they serve. Examples of products sold into the Industrial and Medical market includes high voltage products for analytical instrumentation, medical equipment, low voltage power supplies used in applications for medical devices, test and measurement, medical lasers, scientific instrumentation and industrial equipment, and power control modules and thermal instrumentation products for material fabrication, processing, and treatment. Our gas monitoring products serve multiple applications in the energy market, air quality monitoring and automobile emission monitoring and testing. The acquisition of Artesyn in September 2019 substantially expanded Advanced Energy's portfolio of products and opportunities in the Industrial and Medical market. In the first half of 2020, the COVID-19 pandemic impacted demand for our products in this market, but demand started to recover in the second half of 2020. Our strategy in the Industrial and Medical market is to expand our product offerings and channel reach, leveraging common platforms, derivatives, and customizations to further penetrate a broader set of applications, such as medical, test and measurement, horticulture, and many other industrial applications.

During 2021, we saw improvement in industrial markets as global economic growth resumed and our customers were able to increase capacity after governmental restrictions were relaxed during the second half of 2020. Demand for medical products during 2020 was driven by critical care applications, offset by lower investment related to elective procedures. During 2021, demand for critical applications has declined while other demand has improved. During 2021, overall customer demand improved, but supply constraints of critical components limited our ability to ship product at the level of customer demand. However, even with the limited supply, revenue from the Industrial and Medical market grew in the year as a result of our growth strategy. We expect demand in the Industrial and Medical market to grow in 2022, but the supply constraint condition has extended into the year. It is not clear how long these supply shortages will persist or how quickly our supply will recover.

DATA CENTER COMPUTING MARKET

Following the acquisition of Artesyn in September 2019, Advanced Energy entered the Data Center Computing market with industry leading power conversion products and technologies, which we sell to OEMs and ODMs of data center server and storage systems, as well as cloud service providers and their partners. Driven by the growing adoption of cloud computing, market demand for server and storage equipment has shifted from enterprise on-premises computing to the data center, driving investments in data center infrastructure. In addition, the data center industry has started to transition to 48 Volt infrastructure, where 48 Volt DC power replaces 12 Volt in server racks in order to improve overall power efficiency. Advanced Energy benefits from these trends by leading the industry in providing 48 Volt server power solutions to the data center industry. Further, demand for edge computing is growing, driven by the need for faster processing, lower latency, higher data security, and more reliability than traditional cloud computing. With a wide range of many unique configurations and requirements, edge computing creates additional opportunities for Advanced Energy. Lastly, the rapid growth and adoption of Artificial Intelligence and machine learning is driving accelerated demand for server and storage racks with increased power density and higher efficiency, which plays well to Advanced Energy's strengths. With a growing presence at both cloud service providers and industry leading data center server and storage vendors, we believe Advanced Energy is well positioned to continue to capitalize on the ongoing shift towards cloud computing. Our strategy in the Data Center and Computing market is to penetrate additional customers and applications based on our differentiated capability and competitive strengths in power density, efficiency, and controls.

In late 2019 and through 2020, demand for our embedded power products in the Data Center Computing market increased significantly driven by our share gains and a capacity ramp at hyperscale customers. In addition, we believe as a consequence of COVID-19, hyperscale demand has risen in the near term given the increased need for cloud and network applications in the current environment. Demand declined in the second half of 2020 as a result of market digestion but started to recover during 2021. However, our 2021 revenue declined due to the limited availability of parts given global supply constraints, which prevented us from producing products to meet the growing demand. We expect demand in this market to grow in 2022, but the supply constraint condition has extended into this year. It is not clear how long these supply shortages will persist or how quickly our supply will recover.

TELECOM AND NETWORKING MARKET

The acquisition of Artesyn in September 2019 provided Advanced Energy with a portfolio of products and technologies that are used across the Telecom and Networking market. Our customers include many leading vendors of wireless infrastructure equipment, telecommunication equipment and computer networking. The wireless telecom market continues to evolve with more advanced mobile standards. 5G wireless technology promises to drive substantial growth opportunities for the telecom industry as it enables new advanced applications such as autonomous vehicles and virtual/augmented reality. Telecom service providers have started to invest in 5G, and this trend is expected to drive demand of our products into the Telecom and Networking market. In datacom, demand is driven by networking investments by telecom service providers and enterprises upgrading of their network, as well as cloud service providers and data centers investing in their networks for increased bandwidth. Our strategy in Telecom and Networking is to optimize our portfolio of products to more differentiated applications, and to focus on 5G infrastructure applications primarily with U.S. and European equipment providers.

Demand in late 2019 and the first half of 2020 was lower as geopolitical issues and consolidation of wireless telecom providers drove slower global investment in cellular and network infrastructure. Revenue increased sequentially in the third and fourth quarters of 2020, primarily as a result of modest improvement in market conditions and improved manufacturing capacity amid COVID-19. During 2021, revenue declined as a result of the limited availability of parts given global supply constraints and our internal decision to optimize our portfolio toward higher margin applications within the Telecom and Networking market. Going into 2022, we expect demand in this market to recover driven by increased investments in 5G infrastructure, but the supply constraint condition has extended into the year. It is not clear how long these supply shortages will persist or how quickly our supply will recover.

Results of Continuing Operations

The analysis presented below is organized to provide the information we believe will be helpful for 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 Part II, Item 8 "Financial Statements and Supplementary Data" of this Annual Report on Form 10-K. Also included in the following analysis are measures that are not in accordance with U.S. GAAP. A reconciliation of the non-GAAP measures to U.S. GAAP is provided below.

The following table sets forth certain data derived from our Consolidated Statements of Operations (in thousands):

	<u>Year Ended December 31,</u>	
	<u>2021</u>	<u>2020</u>
Sales	\$ 1,455,954	\$ 1,415,826
Gross profit	532,322	541,869
Operating expenses	<u>380,641</u>	<u>365,846</u>
Operating income from continuing operations	151,681	176,023
Other income (expense), net	<u>(2,970)</u>	<u>(17,876)</u>
Income from continuing operations before income taxes	148,711	158,147
Provision for income taxes	<u>14,004</u>	<u>22,996</u>
Income from continuing operations, net of income taxes	<u>\$ 134,707</u>	<u>\$ 135,151</u>

The following table sets forth the percentage of sales represented by certain items reflected in our Consolidated Statements of Operations:

	<u>Year Ended December 31,</u>	
	<u>2021</u>	<u>2020</u>
Sales	100.0 %	100.0 %
Gross profit	36.6	38.3
Operating expenses	<u>26.1</u>	<u>25.8</u>
Operating income from continuing operations	10.4	12.4
Other income (expense), net	<u>(0.2)</u>	<u>(1.3)</u>
Income from continuing operations before income taxes	10.2	11.2
Provision for income taxes	<u>1.0</u>	<u>1.6</u>
Income from continuing operations, net of income taxes	<u>9.3 %</u>	<u>9.5 %</u>

SALES, NET

The following tables summarize annual sales and percentages of sales by markets (in thousands):

	Year Ended December 31,		Change 2021 v. 2020	
	2021	2020	Dollar	Percent
Semiconductor Equipment	\$ 710,174	\$ 611,864	\$ 98,310	16.1 %
Industrial and Medical	341,176	313,646	27,530	8.8
Data Center Computing	270,924	322,539	(51,615)	(16.0)
Telecom and Networking	133,680	167,777	(34,097)	(20.3)
Total	<u>\$ 1,455,954</u>	<u>\$ 1,415,826</u>	<u>\$ 40,128</u>	<u>2.8 %</u>

	Years Ended December 31,	
	2021	2020
Semiconductor Equipment	48.8 %	43.2 %
Industrial and Medical	23.4	22.1
Data Center Computing	18.6	22.8
Telecom and Networking	9.2	11.9
Total	<u>100.0 %</u>	<u>100.0 %</u>

OPERATING EXPENSE

The following table summarizes our operating expense as a percentage of sales (in thousands):

	Years Ended December 31,			
	2021		2020	
Research and development	\$ 161,831	11.1 %	\$ 143,961	10.2 %
Selling, general, and administrative	191,998	13.2	188,590	13.3
Amortization of intangible assets	22,060	1.5	20,129	1.4
Restructuring charges	4,752	0.3	13,166	0.9
Total operating expenses	<u>\$ 380,641</u>	<u>26.1 %</u>	<u>\$ 365,846</u>	<u>25.8 %</u>

2021 Results Compared To 2020

SALES

Sales increased \$40.1 million, or 2.8%, to \$1,456.0 million, as compared to \$1,415.8 million in the prior year. The increase in sales was primarily due to increased demand and shipments in the Semiconductor Equipment and Industrial and Medical markets, offset by lower sales from the Data Center Computing market and the Telecom and Networking market. In addition, the first half of 2020 was negatively impacted by factory shutdowns related to COVID-19. Revenues in 2021 were negatively impacted across all of our markets by supply chain shortages for certain IC's and other components, which limited our ability to ship to our total demand.

Sales in the Semiconductor Equipment market increased \$98.3 million, or 16.1%, to \$710.2 million, as compared to \$611.9 million in the prior year. The increase in sales during 2021 is primarily due to an overall increase in demand for semiconductor equipment used in deposition and etch applications, increasing power content in semiconductor manufacturing tools, and market share gains in several areas across our portfolio.

Sales to the Industrial and Medical market increased \$27.5 million, or 8.8%, to \$341.2 million, as compared to \$313.6 million in the prior year. Our customers in this market are primarily global and regional original equipment and device manufacturers. The increase in sales year to date was primarily due to improving macroeconomic conditions and the continued recovery from the COVID-19 pandemic driving stronger demand.

Sales in the Data Center Computing market decreased \$51.6 million, or 16.0%, to \$270.9 million, as compared to \$322.5 million in the prior year. The decrease in Data Center Computing market sales is due in part to digestion of equipment at key accounts following strong revenue last year and supply constraints, which limited our ability to ship sufficiently to meet customer demand.

Sales in the Telecom and Networking market decreased \$34.1 million, or 20.3%, as compared to \$167.8 million in the prior year. The decrease in sales was due to in part to our decision to optimize our product portfolio towards higher margin applications and production limitations due to supply constraints. Over time, we expect that 5G infrastructure investments and upgrades to enterprise networks will drive growth in this market.

Our acquisitions of TEGAM and Versatile Power contributed \$12.1 million to 2021 sales. See *Note 2: Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data" for details.

BACKLOG

The following table summarizes our backlog (in thousands):

	December 31,	December 31,	Change	
	2021	2020	Dollar	Percent
Backlog	\$ 927,810	\$ 290,681	\$ 637,129	219.2 %

GROSS PROFIT

Gross profit decreased \$9.5 million to \$532.3 million, or 36.6% of revenue, as compared to \$541.9 million, or 38.3%, in the prior year. The decrease in gross profit as a percent of revenue is largely related to higher material and freight costs. Additional drivers of our decrease in gross profit include productivity inefficiencies resulting from supply constraints, COVID-19 capacity restrictions, and the transition of our Shenzhen, PRC manufacturing to Penang, Malaysia. These decrease drivers were partly offset by increased volume and favorable product mix.

OPERATING EXPENSE

Research and Development

We perform R&D to develop new or emerging applications, technological advances to provide higher performance, or significant enhancements. We believe that continued development of technological applications, as well as enhancements to existing products and related software 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.

R&D expenses increased \$17.9 million to \$161.8 million, as compared to \$144.0 million in the prior year. The increase in research and development expense is related to increased headcount and associated costs, outside technical services, and engineering materials as we invested in new programs to maintain and increase our technological leadership and provide solutions to our customers' evolving needs. Our recent acquisitions of Versatile Power and TEGAM resulted in a combined increase of \$2.5 million to R&D expenses. See *Note 2: Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data" for additional details.

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 \$3.4 million to \$192.0 million, as compared to \$188.6 million in the prior year. The increase in SG&A is principally related to acquisition related activity partially offset by a reduction in variable compensation. See *Note 2: Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data" for additional details.

Amortization of Intangibles

Amortization expense increased \$1.9 million to \$22.1 million, as compared to \$20.1 million in the prior year. The increase in 2021 was primarily driven by incremental amortization of newly acquired intangible assets. For additional information, see *Note 13. Intangible Assets* in Part II, Item 8 "Financial Statements and Supplementary Data."

Restructuring

Restructuring charges relate to previously announced management plans to optimize our manufacturing footprint to lower cost regions, improvements in operating efficiencies, and synergies related to acquisitions. For additional information, see *Note 14. Restructuring Costs* in Part II, Item 8 "Financial Statements and Supplementary Data."

Other Income (Expense), net

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), net was (\$3.0) million in 2021, as compared to (\$17.9) million in the prior year. The decrease between periods is primarily due to decreased interest expense related to our term note due to lower interest rates, as well as more favorable impacts from foreign exchange rate changes and gains on certain acquisition related reserves.

Provision for Income Taxes (in thousands)

	Years Ended December 31,		
	2021	2020	2019
Income from continuing operations, before income taxes	\$ 148,711	\$ 158,147	\$ 67,194
Provision for income taxes	\$ 14,004	\$ 22,996	\$ 10,699
Effective tax rate	9.4 %	14.5 %	15.9

Our effective tax rates differ from the U.S. federal statutory rate of 21% for the years ended December 31, 2021, 2020, and 2019, primarily due to the benefit of earnings in foreign jurisdictions which are subject to lower tax rates, as well as reductions in uncertain tax positions and tax credits, offset by net U.S. tax on foreign operations, withholding taxes, and audit settlements. The effective tax rate for 2021 was lower than the same period in 2020, primarily due to the mix of discrete events between the two periods.

Our future effective income tax rate depends on various factors, such as changes in tax laws, regulations, accounting principles, or interpretations thereof, and the geographic composition of our pre-tax income. We carefully monitor these factors and adjust our effective income tax rate accordingly.

Non-GAAP Results

Management uses non-GAAP operating income and non-GAAP earnings per share ("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 stock-based compensation and amortization of intangible assets. In addition, they exclude discontinued operations and other non-recurring items such as acquisition-related costs and restructuring expenses, 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 and effect of adoption of the Tax Cuts and Jobs Act.

Reconciliation of non-GAAP measure - operating expenses and operating income from continuing operations, excluding certain items (in thousands)	Years Ended December 31,	
	2021	2020
Gross profit from continuing operations, as reported	\$ 532,322	\$ 541,869
Adjustments to gross profit:		
Stock-based compensation	764	567
Facility expansion, relocation costs and other	6,189	4,349
Acquisition-related costs	3,585	5,381
Non-GAAP gross profit	542,860	552,166
Non-GAAP gross margin	37.3%	39.0%
Operating expenses from continuing operations, as reported	380,641	365,846
Adjustments:		
Amortization of intangible assets	(22,060)	(20,129)
Stock-based compensation	(14,975)	(11,705)
Acquisition-related costs	(6,803)	(10,209)
Facility expansion, relocation costs and other	(229)	(2,213)
Restructuring charges	(4,752)	(13,166)
Non-GAAP operating expenses	331,822	308,424
Non-GAAP operating income	\$ 211,038	\$ 243,742
Non-GAAP operating margin	14.5%	17.2%

Reconciliation of non-GAAP measure - income from continuing operations, excluding certain items (in thousands, except per share amounts)	Year Ended December 31,	
	2021	2020
Income from continuing operations, less non-controlling interest, net of income taxes	\$ 134,663	\$ 135,096
Adjustments:		
Amortization of intangible assets	22,060	20,129
Acquisition-related costs	10,388	15,590
Facility expansion, relocation costs, and other	6,418	6,562
Restructuring charges	4,752	13,166
Unrealized foreign currency (gain) loss	(3,543)	8,384
Acquisition-related costs and other included in other income (expense), net	(2,186)	716
Tax effect of non-GAAP adjustments	(1,346)	(7,611)
Non-GAAP income, net of income taxes, excluding stock-based compensation	171,206	192,032
Stock-based compensation, net of taxes	12,042	9,418
Non-GAAP income, net of income taxes	\$ 183,248	\$ 201,450
Non-GAAP diluted earnings per share	\$ 4.78	\$ 5.23

Impact of Inflation

In recent years, inflation has not had a significant impact on our operations. However, more recently we are experiencing price increases in select components driven by higher global demand, supply chain disruptions, and increased freight costs. 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. From time to time, we may also reduce prices to customers based on reductions in the cost structure of our products from cost improvement initiatives and decreases in component part prices.

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, cash generated from current operations, and available borrowing capacity under the Revolving Facility (defined below).

On December 31, 2021, we had \$546.7 million in cash, cash equivalents, and marketable securities.

We believe the above sources of liquidity will be adequate to meet anticipated working capital needs, anticipated levels of capital expenditures, contractual obligations, debt repayment, share repurchase programs, and dividends for the next twelve months and on a long-term basis. We may, however, depending upon the number or size of additional acquisitions, seek additional financing from time to time.

Credit Facility

In September 2019, in connection with the Artesyn Acquisition Agreement, we entered into a credit agreement ("Credit Agreement") that provided aggregate financing of \$500.0 million, consisting of a \$350.0 million senior unsecured term loan facility (the "Term Loan Facility") and a \$150.0 million senior unsecured revolving facility (the "Revolving Facility" and together with the Term Loan Facility, the "Credit Facility").

In April 2020, we executed interest rate swap contracts with independent financial institutions to partially reduce the variability of cash flows in LIBOR indexed debt interest payments on our Term Loan Facility (under our existing Credit Agreement dated September 10, 2019, as amended). The interest rate swap contracts fixed a portion of the outstanding principal balance on our term loan to a total interest rate of 1.271%. See *Note 8. Derivative Financial Instruments* in Part II, Item 8 "Financial Statements and Supplemental Data" for additional information.

In September 2021, we amended the Credit Agreement whereby we borrowed an additional \$85.0 million, which increased the aggregate amount outstanding under the Term Loan Facility to \$400.0 million. In addition, we increased the Revolving Facility capacity by \$50.0 million to \$200.0 million. Both the Term Loan Facility and Revolving Facility mature on September 9, 2026.

On December 31, 2021, we had \$200.0 million in available funding under the Revolving Facility. The Term Loan Facility requires quarterly repayments of \$5.0 million plus accrued interest, with the remaining balance due in September 2026. For more information on the Credit Facility, see *Note 21. Credit Facility* and *Note 8. Derivative Financial Instruments* in Part II, Item 8 "Financial Statements and Supplemental Data" for additional information.

Dividends

In December 2020, the Board approved a dividend program under which we began paying and intend to continue to pay a quarterly cash dividend of \$0.10 per share of capital stock. In March 2021, we paid the first quarterly cash dividend since our inception as a public company. During 2021, we paid cash dividends totaling \$15.4 million. Future dividend payments are subject to the Board's future discretion and approval.

Share Repurchase

To execute the repurchase of shares of our common stock, we periodically enter into stock repurchase agreements. The following table summarizes these repurchases:

(in thousands, except per share amounts)	Years Ended December 31,	
	2021	2020
Amount paid to repurchase shares	\$ 78,125	\$ 11,630
Number of shares repurchased	901	244
Average repurchase price per share	\$ 86.76	\$ 47.75
Remaining authorized by Board of Directors for future repurchases as of period end	\$ 128,377	\$ 38,369

On July 29, 2021, the Board approved an increase to the share repurchase program, which authorized the Company to repurchase up to \$200 million in shares of our common stock with no time limitation.

Cash Flows

A summary of our cash from operating, investing, and financing activities was as follows (in thousands):

	Years Ended December 31,	
	2021	2020
Net cash from operating activities from continuing operations	\$ 140,914	\$ 202,159
Net cash from operating activities from discontinued operations	(669)	(923)
Net cash from operating activities	140,245	201,236
Net cash from investing activities from continuing operations	(47,302)	(42,840)
Net cash from financing activities from continuing operations	(25,372)	(29,612)
Effect of currency translation on cash and cash equivalents	(3,567)	5,143
Increase in cash and cash equivalents	64,004	133,927
Cash and cash equivalents, beginning of period	480,368	346,441
Cash and cash equivalents, end of period	\$ 544,372	\$ 480,368

Net Cash From Operating Activities

Net cash from operating activities was \$140.9 million, a decrease of \$61.3 million, compared to \$202.2 million in the prior year. The decrease in net cash flows from operating activities as compared to 2020 was due to an unfavorable increase in net operating assets driven primarily by our increased investment in inventory as we attempted to mitigate supply chain constraints. This was partially offset by an increase in accounts payable.

Net Cash From Investing Activities

Net cash from investing activities in 2021 was (\$47.3) million, driven by the following:

- (\$31.9) million in purchases of property and equipment as we invested in our manufacturing footprint and capacity;
- (\$21.5) million for business combinations; and
- \$6.1 million related to receipts on notes receivable and proceeds from sale of assets.

Net cash from investing activities in 2020 was (\$42.8) million, and primarily related to investment in facilities and capacity.

Net Cash From Financing Activities

Net cash from financing activities in 2021 was (\$25.4) million and included:

- \$83.7 million in proceeds from borrowings, net of debt-issuance costs paid;
- (\$15.4) million for dividend payments;
- (\$13.8) million for repayment of long-term debt;
- (\$78.1) million related to repurchases of our common stock; and
- \$ (1.8) million in net payments related to stock-based award activities.

The net cash from financing activities in 2020 was (\$29.6) million and included:

- (\$17.5) million for repayment of long-term debt;
- (\$11.6) million related to repurchases of our common stock; and (\$0.5) million related to stock-based award activities.

Off-Balance Sheet Arrangements

As of December 31, 2021, we did not have any off-balance sheet arrangements, as defined in Item 303(a)(4)(ii) of Regulation S-K.

Contractual Obligations

In the normal course of business, we enter into contracts and commitments that obligate us to make payments in the future. Information regarding our obligations relating to income taxes, lease obligations, pension liabilities, and debt are provided in *Note 5. Income Taxes*, *Note 16. Leases*, *Note 17. Pension Liability* and *Note 21. Credit Facility*, respectively, in Part II, Item 8 "Financial Statements and Supplementary Data."

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 Part II, 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.

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.

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 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 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.

The functional currencies of our worldwide facilities primarily include the United States Dollar (USD), Euro, South Korean Won, New Taiwan Dollar, Japanese Yen, Pound Sterling, and Chinese Yuan. Our purchasing and sales activities are primarily denominated in the USD, Japanese Yen, Euro, and Chinese Yuan.

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.

As currencies fluctuate against each other we are exposed to foreign currency exchange rate risk on sales, purchasing transactions, and labor. Exchange rate fluctuations could require us to increase prices to foreign customers, which could result in lower net sales. 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. Changes in the relative buying power of our customers may impact sales volumes.

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 may be denominated in foreign currency. Changes in exchange rates therefore may have a material impact on their valuation in USD and 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.

Interest Rate Risk

Our market risk exposure relates primarily to changes in interest rates on our Credit Facility. The following table summarizes borrowings (in thousands) under our Credit Facility and the associated interest rate.

	December 31, 2021		
	Balance	Interest Rate	Unused Line Fee
Term Loan Facility subject to a fixed interest rate	\$ 255,719	1.271%	—
Term Loan Facility subject to a variable interest rate	139,281	0.890%	—
Revolving Facility subject to a variable interest rate	—	0.890%	0.10%
Total borrowings under the Credit Agreement	<u>\$ 395,000</u>		

For more information on the Term Loan Facility see *Note 21. Credit Facility* in Part II, Item 8 "Financial Statements and Supplementary Data." For more information on the interest rate swap that fixes the interest rate for a portion of our Term Loan Facility, see *Note 8. Derivative Financial Instruments* in Part II, Item 8 "Financial Statements and Supplementary Data." The Term Loan Facility and Revolving Facility bear interest, at our option, at a rate based on a reserve adjusted "Eurodollar Rate" or "Base Rate," as defined in the Credit Agreement, plus an applicable margin.

Our interest payments are impacted by interest rate fluctuations. With respect to the portion of our Credit Facility that is subject a variable interest rate, a hypothetical increase of 100 basis points (1%) in interest rates would have a \$1.4 million annual impact on our interest expense. A change in interest rates does not have a material impact upon our future earnings and cash flow for fixed rate debt. However, increases in interest rates could impact our ability to refinance existing maturities and acquire additional debt on favorable terms.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

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Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Advanced Energy Industries, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Advanced Energy Industries, Inc. (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2021, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 16, 2022 expressed an unqualified opinion thereon.

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 regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

<i>Description of the Matter</i>	<p><i>Accounting for income taxes</i></p> <p>For the year-ended December 31, 2021, the Company recognized a provision for income taxes of \$14.0 million. As described in Notes 1 and 5 to the consolidated financial statements, the Company is subject to income taxes in the United States and various foreign jurisdictions, which affect the Company's provision for income taxes. Management exercises judgment in interpretation and application of complex tax law when determining the Company's provision for income taxes.</p> <p>Evaluating management's application of current tax regulations in various tax jurisdictions and the impact of those regulations on the Company's foreign and United States federal income tax provisions required complex auditor judgment and the use of tax subject matter professionals with specialized skills.</p>
<i>How We Addressed the Matter in Our Audit</i>	<p>We obtained an understanding, evaluated the design and tested the operating effectiveness of the controls over the Company's accounting for income taxes. For example, we tested controls over management's review of the tax provision which includes their review of the underlying data used in the provision, foreign income inclusions reflected in the United States federal income tax provision and the basis by which the Company achieves certain tax holidays in foreign jurisdictions.</p> <p>To test the Company's provision for income taxes, we performed audit procedures that included, among others, testing the calculation of the provision, including the completeness and accuracy of the underlying data. We tested the tax rates used by management in the computation of the provision including compliance with tax holiday requirements. We assessed the reasonableness of profit margin by tax jurisdiction related to intercompany transactions. We also tested calculations of foreign income inclusions included in the Company's United States federal income tax provision. As part of these procedures, we engaged tax subject matter professionals with knowledge of and experience with international and local income tax laws to evaluate the application of these regulations to the Company's tax positions. We have also evaluated the Company's income tax disclosures included in Note 5 of the consolidated financial statements in relation to these matters.</p>

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2019.

Denver, Colorado
March 16, 2022

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

	December 31, 2021	December 31, 2020
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 544,372	\$ 480,368
Marketable securities	2,296	2,654
Accounts and other receivable, net	237,227	235,178
Inventories	338,410	221,346
Income taxes receivable	10,768	4,804
Other current assets	29,161	35,899
Total current assets	<u>1,162,234</u>	<u>980,249</u>
Property and equipment, net	114,830	114,731
Operating lease right-of-use assets	101,769	103,858
Deposits and other assets	19,669	19,101
Goodwill	212,190	209,983
Intangible assets, net	159,406	168,939
Deferred income tax assets	47,242	50,801
TOTAL ASSETS	<u>\$ 1,817,340</u>	<u>\$ 1,647,662</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 193,708	\$ 125,224
Income taxes payable	9,226	11,850
Accrued payroll and employee benefits	55,833	63,487
Other accrued expenses	53,445	49,565
Customer deposits and other	22,141	12,179
Current portion of long-term debt	20,000	17,500
Current portion of operating lease liabilities	15,843	16,592
Total current liabilities	<u>370,196</u>	<u>296,397</u>
Long-term debt, net	372,733	304,546
Operating lease liabilities	95,180	95,993
Pension benefits	67,255	80,447
Deferred income tax liabilities	9,921	10,088
Uncertain tax positions	5,940	12,839
Long-term deferred revenue	6,200	7,352
Other long-term liabilities	18,419	24,660
Total liabilities	<u>945,844</u>	<u>832,322</u>
Commitments and contingencies (Note 19)		
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; 37,589 and 38,293 issued and outstanding at December 31, 2021 and 2020, respectively	38	38
Additional paid-in capital	115,706	105,009
Accumulated other comprehensive loss	(1,216)	(2,605)
Retained earnings	756,323	712,297
Advanced Energy stockholders' equity	<u>870,851</u>	<u>814,739</u>
Noncontrolling interest	645	601
Total stockholders' equity	<u>871,496</u>	<u>815,340</u>
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	<u>\$ 1,817,340</u>	<u>\$ 1,647,662</u>

The accompanying notes are an integral part of these consolidated financial statements

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

	Years Ended December 31,		
	2021	2020	2019
Sales, net	\$ 1,455,954	\$ 1,415,826	\$ 788,948
Cost of sales	923,632	873,957	473,296
Gross profit	532,322	541,869	315,652
Operating expenses:			
Research and development	161,831	143,961	101,503
Selling, general, and administrative	191,998	188,590	142,555
Amortization of intangible assets	22,060	20,129	12,168
Restructuring expense	4,752	13,166	5,038
Total operating expenses	380,641	365,846	261,264
Operating income	151,681	176,023	54,388
Other income (expense), net	(2,970)	(17,876)	12,806
Income from continuing operations, before income taxes	148,711	158,147	67,194
Provision for income taxes	14,004	22,996	10,699
Income from continuing operations	134,707	135,151	56,495
Income (loss) from discontinued operations, net of income taxes	73	(421)	8,480
Net income	\$ 134,780	\$ 134,730	\$ 64,975
Income from continuing operations attributable to noncontrolling interest	44	55	34
Net income attributable to Advanced Energy Industries, Inc.	\$ 134,736	\$ 134,675	\$ 64,941
Basic weighted-average common shares outstanding	38,143	38,314	38,281
Diluted weighted-average common shares outstanding	38,355	38,542	38,495
Earnings per share:			
Continuing operations:			
Basic earnings per share	\$ 3.53	\$ 3.53	\$ 1.47
Diluted earnings per share	\$ 3.51	\$ 3.51	\$ 1.47
Discontinued operations:			
Basic earnings (loss) per share	\$ —	\$ (0.01)	\$ 0.22
Diluted earnings (loss) per share	\$ —	\$ (0.01)	\$ 0.22
Net income:			
Basic earnings per share	\$ 3.53	\$ 3.52	\$ 1.70
Diluted earnings per share	\$ 3.51	\$ 3.50	\$ 1.69

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

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

	<u>Years Ended December 31,</u>		
	<u>2021</u>	<u>2020</u>	<u>2019</u>
Net income	\$ 134,780	\$ 134,730	\$ 64,975
Other comprehensive income (loss), net of income taxes			
Foreign currency translation	(12,262)	13,095	(2,523)
Change in fair value of cash flow hedges	4,246	(2,139)	—
Minimum benefit retirement liability	9,405	(7,664)	75
Comprehensive income	<u>136,169</u>	<u>138,022</u>	<u>62,527</u>
Comprehensive income attributable to noncontrolling interest	44	55	34
Comprehensive income attributable to Advanced Energy Industries, Inc.	<u>\$ 136,125</u>	<u>\$ 137,967</u>	<u>\$ 62,493</u>

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

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

Advanced Energy Industries, Inc. Stockholders' Equity

	<u>Common Stock</u>		<u>Additional Paid-in Capital</u>	<u>Accumulated Other Comprehensive Income</u>	<u>Retained Earnings</u>	<u>Non- controlling Interest</u>	<u>Total Stockholders' Equity</u>
	<u>Shares</u>	<u>Amount</u>					
Balances, December 31, 2018	38,164	\$ 38	\$ 97,418	\$ (3,449)	\$ 512,783	\$ 512	\$ 607,302
Stock issued from equity plans	194	—	104	—	—	—	104
Stock-based compensation	—	—	7,327	—	—	—	7,327
Other comprehensive income (loss)	—	—	—	(2,448)	—	—	(2,448)
Net income	—	—	—	—	64,941	34	64,975
Balances, December 31, 2019	38,358	38	104,849	(5,897)	577,724	546	677,260
Adoption of new accounting standards	—	—	—	—	(102)	—	(102)
Stock issued from equity plans	179	—	(482)	—	—	—	(482)
Stock-based compensation	—	—	12,272	—	—	—	12,272
Share repurchase	(244)	—	(11,630)	—	—	—	(11,630)
Other comprehensive income	—	—	—	3,292	—	—	3,292
Net income	—	—	—	—	134,675	55	134,730
Balances, December 31, 2020	38,293	38	105,009	(2,605)	712,297	601	815,340
Stock issued from equity plans	197	—	(1,931)	—	—	—	(1,931)
Stock-based compensation	—	—	15,428	—	—	—	15,428
Share repurchase	(901)	—	(2,800)	—	(75,325)	—	(78,125)
Dividends declared (\$0.10 per share)	—	—	—	—	(15,385)	—	(15,385)
Other comprehensive income	—	—	—	1,389	—	—	1,389
Net income	—	—	—	—	134,736	44	134,780
Balances, December 31, 2021	37,589	\$ 38	\$ 115,706	\$ (1,216)	\$ 756,323	\$ 645	\$ 871,496

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

ADVANCED ENERGY INDUSTRIES, INC.
Consolidated Statements of Cash Flows
(In thousands)

	Years Ended December 31,		
	2021	2020	2019
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net income	\$ 134,780	\$ 134,730	\$ 64,975
Less: income (loss) from discontinued operations, net of income taxes	73	(421)	8,480
Income from continuing operations, net of income taxes	134,707	135,151	56,495
Adjustments to reconcile net income to net cash from operating activities:			
Depreciation and amortization	52,893	47,770	26,147
Stock-based compensation expense	15,739	12,272	7,327
Provision for deferred income taxes	1,326	(622)	1,015
(Gain) loss from discount on notes receivable	(638)	721	1,100
Gain on sale of central inverter service business	—	—	(14,795)
Loss on disposal of assets	1,496	1,296	700
Changes in operating assets and liabilities, net of assets acquired:			
Accounts and other receivable, net	5,271	15,412	(18,879)
Inventories	(115,737)	11,658	3,687
Other assets	(2,910)	1,750	23,544
Accounts payable	67,111	(48,163)	(16,094)
Other liabilities and accrued expenses	(4,414)	24,520	(12,486)
Income taxes	(13,930)	394	(9,862)
Net cash from operating activities from continuing operations	140,914	202,159	47,899
Net cash from operating activities from discontinued operations	(669)	(923)	493
Net cash from operating activities	140,245	201,236	48,392
CASH FLOWS FROM INVESTING ACTIVITIES:			
Net proceeds from sale of marketable securities	—	3	1,742
Receipt (issuance) of notes receivable	3,050	(1,000)	(4,300)
Proceeds from sale of assets	3,060	116	—
Purchases of property and equipment	(31,877)	(36,483)	(25,188)
Acquisitions, net of cash acquired	(21,535)	(5,476)	(366,101)
Net cash from investing activities	(47,302)	(42,840)	(393,847)
CASH FLOWS FROM FINANCING ACTIVITIES:			
Proceeds from long-term borrowings	85,000	—	347,486
Payment of debt-issuance costs	(1,350)	—	—
Payments on long-term borrowings	(13,750)	(17,500)	(8,750)
Dividend payments	(15,385)	—	—
Purchase and retirement of common stock	(78,125)	(11,630)	—
Net payments related to stock-based awards	(1,762)	(482)	104
Net cash from financing activities	(25,372)	(29,612)	338,840
EFFECT OF CURRENCY TRANSLATION ON CASH AND CASH EQUIVALENTS	(3,567)	5,143	(1,496)
NET CHANGE IN CASH AND CASH EQUIVALENTS	64,004	133,927	(8,111)
CASH AND CASH EQUIVALENTS, beginning of period	480,368	346,441	354,552
CASH AND CASH EQUIVALENTS, end of period	\$ 544,372	\$ 480,368	\$ 346,441
SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION:			
Cash paid for interest	\$ 4,040	\$ 5,278	\$ 3,479
Cash paid for income taxes	32,543	21,032	18,594
Cash received for refunds of income taxes	12,506	1,569	1,762

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

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except per share amounts)

NOTE 1. OPERATIONS AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND ESTIMATES

Advanced Energy Industries, Inc., a Delaware corporation, and its wholly-owned subsidiaries ("we," "us," "our," "Advanced Energy," or the "Company") design, manufacture, sell, and support precision power products that transform, refine, and modify the raw electrical power coming from either the utility or the building facility and convert it into various types of highly controllable, usable power that is predictable, repeatable, and customizable to meet the necessary requirements for powering a wide range of complex equipment. Our power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition, high and low voltage applications such as semiconductor process control, data center computing, networking, telecommunication, medical equipment, life science applications, industrial technology and production, scientific instruments, clean technology production, advanced material production and temperature-critical thermal applications. We also supply related sensing, controls, and instrumentation products for advanced measurement and calibration of radio frequency ("RF") power and temperature, and electrostatic instrumentation products for test and measurement applications. Our network of global service support centers provides a recurring revenue opportunity as we offer repair services, conversions, upgrades, refurbishments, and used equipment to companies using our products.

In September 2019, we acquired the Artesyn Embedded Power business ("Artesyn"), which added new power products and technologies used in networking and computing, data center, including hyperscale, and industrial and medical applications. As of December 31, 2015, we discontinued our engineering, production, and sales of our inverter product line. As such, all inverter product revenues, costs, assets, and liabilities are reported in Discontinued Operations for all periods presented herein. See *Note 4. Disposed and Discontinued Operations* for more information. Ongoing inverter repair and service operations are reported as part of our continuing operations.

Principles of Consolidation — Our consolidated financial statements include our accounts and the accounts of our wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated. Our consolidated financial statements are stated in United States ("U.S.") Dollars and have been prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP").

Use of Estimates in the Preparation of the Consolidated Financial Statements — The preparation of our consolidated financial statements in conformity with U.S. GAAP requires us to make estimates, assumptions, and judgments that affect the reported amounts of assets and liabilities, the disclosure of contingent liabilities at the date of the financial statements, and the reported amounts of revenue and expenses during the reporting period. The significant estimates, assumptions, and judgments include, but are not limited to:

- excess and obsolete inventory;
- acquisitions and asset valuations, and
- pension obligations;
- taxes and other provisions.

Foreign Currency Translation — The functional currency of certain of our foreign subsidiaries is the local currency. Assets and liabilities of these foreign subsidiaries are translated to the United States Dollar at prevailing exchange rates on the balance sheet date. Revenues and expenses are translated at the average exchange rates in effect for each period. Translation adjustments resulting from this process are reported as a separate component of Other Comprehensive Income.

For certain other subsidiaries, the functional currency is the U.S. Dollar. Foreign currency transactions are recorded based on exchange rates at the time such transactions arise. Subsequent changes in exchange rates for foreign currency denominated monetary assets and liabilities result in foreign currency transaction gains and losses, which are reflected as unrealized (based on period end remeasurement) or realized (upon settlement of the transactions) in Other income (expense), net in our Consolidated Statements of Operations.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Derivatives — We use derivative financial instruments to manage risks associated with foreign currency and interest rate fluctuations. Unless we meet specific hedge accounting criteria, changes in the fair value of derivative financial instruments are recognized in the Consolidated Statements of Operations within Other income (expense), net.

For derivatives designated as cash flow hedges, changes in fair value are recorded to Accumulated other comprehensive loss on the Consolidated Balance Sheets and are reclassified to earnings when the underlying forecasted transaction affects earnings. We reassess the probability of the underlying forecasted transactions occurring on a quarterly basis.

Fair Value — We value our financial assets and liabilities using fair value measurements.

U.S. GAAP for fair value establishes a hierarchy that prioritizes fair value measurements based on the types of inputs used for the various valuation techniques (market approach, income approach, and cost approach). Our financial assets and liabilities are measured using inputs from the three levels of the fair value hierarchy. The three levels of the hierarchy and the related inputs are as follows:

- Level 1 — Quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access on the measurement date.
- Level 2 — Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.
- Level 3 — Unobservable inputs for the asset or liability.

We categorize fair value measurements within the fair value hierarchy based upon the lowest level of the most significant inputs used to determine fair value. Our assessment of the significance of a particular input to the fair value measurement requires judgment and may affect the valuation of the fair value of assets and liabilities and their placement within the fair value hierarchy levels.

The carrying amounts of our cash and cash equivalents, accounts receivable, accounts payable and other current assets and liabilities approximate fair value as recorded due to the short-term nature of these instruments.

Our non-financial assets, which primarily consist of property and equipment, goodwill, and other intangible assets, are not required to be carried at fair value on a recurring basis and are reported at carrying value. However, on a periodic basis or whenever events or changes in circumstances indicate that their carrying value may not be fully recoverable (and at least annually for goodwill), non-financial instruments are assessed for impairment and, if applicable, written down to and recorded at fair value. See *Note 12. Goodwill* and *Note 13. Intangible Assets* for further discussion and presentation of these amounts.

The fair value of borrowings approximates the recorded borrowing value based upon market interest rates for similar facilities. See *Note 21. Credit Facility* for additional information. The fair value of contingent consideration and other acquired assets and liabilities associated with our acquisitions are based on Level 3 inputs.

Cash, Cash Equivalents, and Marketable Securities — We consider all amounts on deposit with financial institutions and highly liquid investments with an original maturity of three months or less at the time of purchase to be cash equivalents. Cash and cash equivalents consist primarily of short-term money market instruments and demand deposits with insignificant interest rate risk.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

In some instances, we invest excess cash in money market funds not insured by the Federal Deposit Insurance Corporation. We believe the investments in money market funds are on deposit with credit-worthy financial institutions and the funds are highly liquid. These investments are reported at fair value and included in Cash and cash equivalents. We record interest income within Other income (expense), net in our Consolidated Statement of Operations.

We classify investments with stated maturities of greater than three months at time of purchase as marketable securities.

Concentrations of Credit Risk — Financial instruments which potentially subject us to credit risk include cash and cash equivalents, marketable securities, and trade accounts receivable. To preserve capital and maintain liquidity, we invest with financial institutions we deem to be of high quality and sound financial condition. Our investments are in low-risk instruments, and we limit our credit exposure in any one institution or type of investment instrument based upon criteria including creditworthiness.

We establish a reserve for credit losses based upon factors surrounding the credit risk of specific customers, historical trends, and other information.

Accounts Receivable and Reserve for Credit Losses — Accounts receivable are recorded at net realizable value. We maintain a credit approval process and we make significant judgments in connection with assessing our customers' ability to pay. 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. We do not require collateral from customers. Our principal customers are original equipment manufacturers ("OEM") and end user customers, which operate globally through wholly owned subsidiaries that purchase our products under substantially the same credit terms, with similar historical credit risks. As a result, we assess credit risks as a single group. We evaluate collection risk and establish expected credit loss primarily through a combination of the following: an assessment of customer credit risk ratings utilizing third party credit risk data, analysis of historical aging and credit loss experience, and customer specific information.

Inventories — Inventories are valued at the lower of cost (first-in, first-out method) or net realizable value and are presented net of reserves for excess and obsolete inventory. General market conditions, as well as our design activities, can cause certain products to become obsolete. We regularly review inventory quantity and write down excess and obsolete inventories based upon a regular analysis of inventory on hand compared to historical and projected end-user demands. The determination of projected end-user demand requires the use of estimates and assumptions related to projected unit sales for each product. Demand for our products can fluctuate significantly. A significant decrease in demand could result in an increase in the charges for excess inventory quantities on hand.

Property and Equipment — Property and equipment are stated at cost or estimated fair value if acquired in a business combination. Depreciation is computed over the estimated useful lives using the straight-line method. Additions and improvements are capitalized, while maintenance and repairs are expensed as incurred.

When depreciable assets are retired, or otherwise disposed of, the cost and related accumulated depreciation are removed from the accounts, and any related gains or losses are included in Other income (expense), net, in our Consolidated Statements of Operations.

Purchase accounting — Business combinations are accounted for using the purchase method of accounting. Under the purchase method, assets and liabilities, including intangible assets, are recorded at their fair values as of the acquisition date. Acquisition costs in excess of amounts assigned to assets acquired and liabilities assumed are recorded as goodwill. Transaction related costs associated with business combinations are expensed as incurred.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Leases — We lease manufacturing and office space under non-cancelable operating leases. Some of these leases contain provisions for landlord funded leasehold improvements, which we record as a reduction to right-of-use ("ROU") assets and the related operating lease liabilities. Our lease agreements generally contain lease and non-lease components, and we combine fixed payments for non-lease components with lease payments and account for them together as a single lease component. Certain lease agreements may contain variable payments, which are expensed as incurred and not included in the right-of-use lease assets and operating lease liabilities. When renewal options are reasonably certain of exercise, we include the renewal period in the lease term. In many cases, we have leases with a term of less than one year. We elected the practical expedient to exclude these short-term leases from our ROU assets and operating lease liabilities. On an ongoing basis, we negotiate and execute new leases to meet business objectives.

Right-of-use assets and operating lease liabilities are recognized at the present value of the future lease payments on the lease commencement date. The interest rate used to determine the present value of the future lease payments is our incremental borrowing rate because the interest rate implicit in our leases is not readily determinable. Our incremental borrowing rate is estimated to approximate the interest rate on a collateralized basis with similar terms and payments. We have a centrally managed treasury function; therefore, we apply a portfolio approach for determining the incremental borrowing rate applicable to the lease term. Operating lease expense is recognized on a straight-line basis over the lease term.

Intangible Assets, Goodwill, and Other Long-Lived Assets — As a result of our acquisitions, we identified and recorded intangible assets and goodwill. Intangible assets are valued based on estimates of future cash flows and amortized over their estimated useful lives. Goodwill is subject to annual impairment testing, as well as testing upon the occurrence of any event that indicates a potential impairment. Intangible assets and other long-lived assets are subject to an impairment test if there is an indicator of impairment. 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 and goodwill may be impaired and the resulting charge to operations may be material. 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.

The estimation of useful lives and expected cash flows requires us to make judgments regarding future periods that are subject to some factors outside of our control. Changes in these estimates can result in revisions to our carrying value of these assets and may result in material charges to our results of operations.

We conduct an annual goodwill impairment analysis 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, 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.

Debt Issuance Costs — We incurred debt issuance costs in connection with our debt facilities. Amounts paid directly to lenders are classified as issuance costs. Commitment fees and other costs directly associated with obtaining credit facilities are classified as deferred financing costs, which are recorded in the Consolidated Balance Sheets and amortized over the term of the facility. We allocated deferred debt issuance costs incurred for the current credit facility between the revolver and term loan based on their relative borrowing capacity. Deferred debt issuance costs associated with the revolving credit facility are recorded within Deposits and other assets and those associated with the term loan are recorded as a reduction of the carrying value of the debt on the Consolidated Balance Sheets. We amortize the majority of deferred debt issuance costs to interest expense using the effective interest rate method. Deferred debt issuance costs on the Line of Credit are amortized on the straight line basis over the life of the debt agreement.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Amortization of debt issuance costs is reflected in Other income (expense), net on the Consolidated Statements of Operations. See *Note 21. Credit Facility* for additional details.

Revenue Recognition — We recognize substantially all revenue at a point in time when we satisfy our performance obligations. Typically, this occurs on shipment of goods or completion of service because, at that point, we transfer control to our customer. The transaction price is based upon the standalone selling price. In most transactions, we have no obligations to our customers after the date products are shipped, other than pursuant to warranty obligations. Revenue is recognized net of any taxes collected from customers, which are subsequently remitted to governmental authorities. Surcharges, cost recoveries, and shipping and handling fees billed to customers, if any, are recognized as revenue. The related cost for shipping and handling fees is recognized in cost of sales. We expense incremental costs of obtaining contracts when the amortization period of the costs is less than one year. These costs are included in Selling, general, and administrative expenses in our Consolidated Statements of Operations. Payment terms for customers extended credit are typically net 30 days.

We maintain a worldwide support organization in ten countries, including the U.S., the People's Republic of China ("PRC"), Japan, Korea, Taiwan, Germany, Ireland, Singapore, Israel, and Great Britain. Support services include warranty and non-warranty repair services, upgrades, and refurbishments on the products we sell. Repairs that are covered under our standard warranty do not generate revenue.

Research and Development Expenses — Costs incurred to advance, test, or otherwise modify our proprietary technology or develop new technologies are considered research and development costs and are expensed when incurred. These costs are primarily comprised of costs associated with the operation of our laboratories and research facilities, including internal labor, materials, and overhead.

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 for up to 20 years. The 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 4. Disposed and Discontinued Operations* for more information. See *Note 15. Warranties* 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, considering 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.

Stock-Based Compensation — Accounting for stock-based compensation requires the measurement and recognition of compensation expense for all stock-based awards made to employees and directors based on estimated fair values.

We estimate the fair value of restricted stock units ("RSUs") on the grant date. For RSUs that contain a time-based and/or performance-based vesting condition, we estimate fair value using the closing share price on the grant date. We record stock-based compensation expense for awards with time-based vesting conditions over the term of the award. For awards with a performance-based vesting condition, we record stock-based compensation expense (based on management's assessment of the probability of meeting the performance conditions) over the estimated period to achieve the performance conditions. Upon forfeiture or expiration of these awards, we reverse the stock-based compensation expense.

Certain RSUs vest based on a market condition. We estimate the fair value and probability of achievement for each tranche of these awards using a Monte Carlo simulation. Because the probability of achievement is a factor in the

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Monte Carlo simulation, we recognize stock-based compensation expense over each tranche's estimated achievement period even if some or all of the shares never vest.

We estimate the fair value of the purchase rights in our employee stock purchase plan using a Black-Scholes Merton option pricing model and recognize compensation expense over the term of the purchase right. For all stock awards, we estimate forfeitures at the grant date and revise those estimates in subsequent periods if actual forfeitures differ from our estimates.

Income Taxes — We follow the liability method of accounting for income taxes under which deferred tax assets and liabilities are recognized for future tax consequences. A deferred tax asset or liability is computed for both the expected future impact of differences between the financial statement and tax basis of assets and liabilities and for the expected future tax benefit to be derived from tax loss and tax credit carryforwards. Tax rate changes are reflected in the period such changes are enacted.

We assess the recoverability of our net deferred tax assets and the need for a valuation allowance on a quarterly basis. Our assessment includes several factors including historical results and taxable income projections for each jurisdiction. The ultimate realization of deferred income tax assets is dependent on the generation of taxable income in appropriate jurisdictions during the periods in which those temporary differences are deductible. We consider the scheduled reversal of deferred income tax liabilities, projected future taxable income, and tax planning strategies in determining the amount of the valuation allowance. Based on the level of historical taxable income and projections for future taxable income over the periods in which the deferred income tax assets are deductible, we determine if we will realize the benefits of these deductible differences.

Accounting for income taxes requires a two-step approach to recognize and measure uncertain tax positions. In general, we are subject to regular examination of our income tax returns by the Internal Revenue Service and other tax authorities. The first step is to evaluate the tax position for recognition by determining, if based on the technical merits, it is more likely than not that the position will be sustained upon audit, including resolutions of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount that is more than 50% likely of being realized upon ultimate settlement. We regularly assess the likelihood of favorable or unfavorable outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. This evaluation is based on factors including, but not limited to, changes in facts or circumstances, changes in tax law, effectively settled issues under audit, and new audit activity.

Under U.S. GAAP, an accounting policy election can be made to either recognize deferred taxes for temporary basis differences expected to reverse as global intangible low-tax income ("GILTI") in future years, or to provide for the tax expense related to GILTI in the year the tax is incurred as a period expense only. We have elected to account for GILTI in the year the tax is incurred.

Commitments and Contingencies — From time to time we are 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 in a particular period. An unfavorable decision, particularly 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. We accrue loss contingencies when it is probable that a loss has occurred or will occur, and the amount of the loss can be reasonably estimated. Our estimates of probability of losses are subjective, involve significant judgment and uncertainties, and are based on the best information we have at any given point in time. Resolution of these uncertainties in a manner inconsistent with our expectations could have a significant impact on our results of operations and financial condition.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NEW ACCOUNTING STANDARDS

New Accounting Standards

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, will not have a material impact on the consolidated financial statements upon adoption.

New Accounting Standards Adopted

In August 2018, the FASB issued ASU 2018-14, "Compensation—Retirement Benefits—Defined Benefit Plans—General (Subtopic 715-20)" ("ASU 2018-14"). ASU 2018-14 eliminates requirements for certain disclosures and requires additional disclosures under defined benefit pension plans and other post-retirement plans. ASU 2018-14 was effective for us on January 1, 2021. The impact of adoption was not material to our consolidated financial statements.

New Accounting Standards Issued But Not Yet Adopted

In March 2020, the FASB issued ASU 2020-04, "Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting" ("ASU 2020-04"). In January 2021, the FASB issued ASU 2021-01, "Reference Rate Reform (Topic 848): Scope" ("ASU 2021-01"). This collective guidance provides optional expedients and exceptions for applying GAAP to contract modifications and hedging relationships, subject to meeting certain criteria, that reference LIBOR or another reference rate that is expected to be discontinued. ASU 2020-04 and ASU 2021-01 will be in effect through December 31, 2022.

Our Credit Facility (refer to *Note 21. Credit Facility*) and interest rate swap agreements (refer to *Note 8. Derivative Financial Instruments*) reference the one-month USD LIBOR rate. Both agreements contain provisions for transition to a new reference rate upon discontinuance of LIBOR. We expect the one-month USD LIBOR rate to be available through June 2023. We are currently assessing the potential timing of transitioning to a replacement interest rate benchmark for our Credit Facility (See *Note 21. Credit Facility*) and do not expect ASU 2020-04 and ASU 2020-01 to materially impact our consolidated financial statements.

In October 2021, the FASB issued ASU 2021-08, "Business Combinations (Topic 806) Accounting for Contract Assets and Contract Liabilities from Contracts with Customers." The amendments in ASU 2021-08 will improve the accounting for acquired revenue contracts with customers in a business combination. This pronouncement will be effective for us on January 1, 2023. We are still evaluating the impact, if any, that the adoption of ASU 2021-08 may have on our consolidated financial statements.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 2. ACQUISITIONS

Intangible Assets Acquired

In January 2021, we acquired certain intangible assets related to the manufacturing of fiber optic sensing equipment. As of December 31, 2021, we paid \$6.1 million in cash and expect to pay an additional \$0.4 million within one year of the closing. These intangible assets have an estimated useful life of five years. See *Note 13. Intangible Assets* for additional details.

TEGAM, Inc.

On June 1, 2021, we acquired 100% of the issued and outstanding shares of capital stock of TEGAM, Inc., which is based in Geneva, Ohio. This acquisition added metrology and calibration instrumentation to Advanced Energy’s RF process power solutions in our Semiconductor and Industrial and Medical markets.

The components of the fair value of the total consideration transferred were as follows:

Cash paid for acquisition	\$ 15,430
Holdback	1,800
Total fair value of consideration transferred	<u>17,230</u>
Less cash acquired	(177)
Total purchase price	<u>\$ 17,053</u>

The following table summarizes the preliminary values of the assets acquired and liabilities assumed:

	Preliminary Fair Value
Current assets and liabilities, net	\$ 3,536
Property and equipment	734
Operating lease right-of-use assets	425
Intangible assets	6,900
Goodwill (deductible for tax purposes)	5,877
Other non-current assets	31
Total assets acquired	<u>17,503</u>
Other non-current liabilities	25
Operating lease liability	425
Total liabilities assumed	<u>450</u>
Total fair value of net assets acquired	<u>\$ 17,053</u>

A summary of the intangible assets acquired, amortization method, and estimated useful lives follows:

		Amortization Method	Useful Life
Technology	\$ 1,100	Straight-line	5
Customer relationships	5,500	Straight-line	15
Tradename	300	Straight-line	5
Total	<u>\$ 6,900</u>		

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Versatile Power, Inc

On December 31, 2020, we acquired 100% of the issued and outstanding shares of Versatile Power, Inc., which is based in Campbell, California. This acquisition added radio frequency ("RF") and programmable power supplies for medical and industrial applications to our product portfolio and further expands our presence in the medical market by adding proven technologies, deep customer relationships, expertise in medical design, and a medical-certified manufacturing center.

The components of the fair value of the total consideration transferred were as follows:

Cash paid for acquisition	\$ 4,654
Holdback	950
Total fair value of consideration transferred	<u>5,604</u>
Less cash acquired	(245)
Total purchase price	<u>\$ 5,359</u>

The following table summarizes the final values of the assets acquired and liabilities assumed:

	<u>Fair Value</u>
Current assets and liabilities, net	\$ 1,021
Property and equipment	35
Operating lease right-of-use assets	463
Intangible assets	4,000
Goodwill (deductible for tax purposes)	323
Total assets acquired	<u>5,842</u>
Other non-current liabilities	20
Operating lease liability	463
Total liabilities assumed	<u>483</u>
Total fair value of net assets acquired	<u>\$ 5,359</u>

A summary of the intangible assets acquired, amortization method, and estimated useful lives follows:

		<u>Amortization</u>	<u>Useful Life</u>
		<u>Method</u>	
Technology	\$ 400	Straight-line	5
Customer relationships	3,600	Straight-line	15
Total	<u>\$ 4,000</u>		

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 3. REVENUE

Nature of goods and services

Products

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, refine, and modify the raw electrical power coming from either the utility or the building facility and convert it into various types of highly controllable, usable power that is predictable, repeatable, and customizable to meet the necessary requirements for powering a wide range of complex equipment.

Our power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition, high and low voltage applications such as process control, data center computing, networking, telecommunication, medical equipment, life science applications, industrial technology and production, scientific instruments, clean technology production, advanced material production and temperature-critical thermal applications such as material and chemical processing. We also supply related sensing, controls, and instrumentation products for advanced measurement and calibration of radio RF power and temperature, electrostatic instrumentation products for test and measurement applications, and gas sensing and monitoring solutions for multiple industrial markets. Our network of global service support centers provides a recurring revenue opportunity as we offer repair services, conversions, upgrades, refurbishments, and used equipment to companies using our products.

Services

Our services group offers warranty and after-market 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 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 in the U.S., the PRC, Japan, Korea, Taiwan, Germany, Ireland, Singapore, Israel, and Great Britain. Support services include warranty and non-warranty repair services, upgrades, and refurbishments on the products we sell.

As part of our ongoing service business, we satisfy our service obligations under preventative maintenance contracts and extended warranties which had previously been offered on our discontinued inverter products. Any up-front fees received for extended warranties or maintenance plans are deferred. Revenue under these arrangements is recognized ratably over the underlying terms as we do not have historical information which would allow us to project the estimated service usage pattern at this time.

The following table summarizes deferred revenue, which relates to extended warranties and service contracts. We expect to recognize this revenue ratably through the year 2031.

	December 31, 2021	December 31, 2020
Deferred revenue	\$ 7,067	\$ 8,671

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Disaggregation of Revenue

The following tables present additional information regarding our revenue:

	Years Ended December 31,		
	2021	2020	2019
Semiconductor Equipment	\$ 710,174	\$ 611,864	\$ 403,018
Industrial and Medical	341,176	313,646	245,992
Data Center Computing	270,924	322,539	91,438
Telecom and Networking	133,680	167,777	48,500
Total	\$ 1,455,954	\$ 1,415,826	\$ 788,948

	Years Ended December 31,					
	2021		2020		2019	
United States	\$ 561,312	38.5 %	\$ 530,965	37.5 %	\$ 321,869	40.8 %
North America (excluding U.S.)	104,167	7.2	156,856	11.1	51,765	6.6
Asia	597,830	41.1	606,893	42.9	295,155	37.4
Europe	179,056	12.3	117,989	8.3	119,427	15.1
Other	13,589	0.9	3,123	0.2	732	0.1
Total	\$ 1,455,954	100.0 %	\$ 1,415,826	100.0 %	\$ 788,948	100.0 %

	Years Ended December 31,		
	2021	2020	2019
Product	\$ 1,318,213	\$ 1,296,867	\$ 678,061
Services	137,741	118,959	110,887
Total	\$ 1,455,954	\$ 1,415,826	\$ 788,948

NOTE 4. DISPOSED AND DISCONTINUED OPERATIONS

Disposed Operations

In May 2019, we sold our grid-tied central solar inverter services business to Bold Renewables Holdings, LLC ("Bold") for \$1.00 dollar and Bold's assumption of certain product warranty obligations. In connection with this transaction, we entered into a Loan and Security Agreement whereby we loaned Bold an aggregate \$5.3 million between May 2019 and the first quarter of 2020. During the year ended December 31, 2021, Bold repaid the amount borrowed at a discounted amount in accordance with the terms of the agreement. The loan is now fully repaid, and the Loan and Security Agreement has been cancelled.

As a result of the transaction, during the year ended December 31, 2019, we reduced our discontinued operations liabilities by approximately \$10.9 million that were related to initial product warranty and reduced our other liabilities by approximately \$22.0 million that were related to extended warranty service obligations as well as reduced other assets and liabilities associated with the continuing grid-tied central solar inverter service and repair business. Accordingly, we recognized a \$14.8 million non-cash gain in Other income (expense) from continuing operations and an \$8.6 million non-cash gain, net of tax expense of \$2.4 million, in Income (loss) from discontinued operations.

Discontinued Operations

In December 2015, we completed the wind down of engineering, manufacturing, and sales of our solar inverter product line. Accordingly, the results of our inverter business are reflected as Income (loss) from discontinued operations, net of income taxes on our Consolidated Statements of Operations.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
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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. We no longer offer extended warranties related to the inverter product line.

NOTE 5. INCOME TAXES

The geographic distribution of pretax income from continuing operations was as follows:

	Years Ended December 31,		
	2021	2020	2019
Domestic	\$ 24,541	\$ 17,526	\$ (20,597)
Foreign	124,170	140,621	87,791
	<u>\$ 148,711</u>	<u>\$ 158,147</u>	<u>\$ 67,194</u>

The provision for income taxes from continuing operations is summarized as follows:

	Years Ended December 31,		
	2021	2020	2019
Current:			
Federal	\$ (2,468)	\$ 5,475	\$ (9,627)
State	929	1,927	882
Foreign	14,217	16,216	18,429
Total current provision	<u>12,678</u>	<u>23,618</u>	<u>9,684</u>
Deferred:			
Federal	762	(312)	3,822
State	(200)	1,270	(178)
Foreign	764	(1,580)	(2,629)
Total deferred provision (benefit)	<u>1,326</u>	<u>(622)</u>	<u>1,015</u>
Total provision for income taxes	<u>\$ 14,004</u>	<u>\$ 22,996</u>	<u>\$ 10,699</u>

Our effective tax rates differ from the U.S. federal statutory rate of 21% for the years ended December 31, 2021, 2020, and 2019 primarily due to the benefit of earnings in foreign jurisdictions which are subject to lower tax rates as well as reductions in uncertain tax positions and tax credits, offset by net U.S. tax on foreign operations, withholding taxes, and audit settlements.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

The principal causes of the difference between the federal statutory rate and the effective income tax rate for each of the years below are as follows:

	Years Ended December 31,		
	2021	2020	2019
Income taxes per federal statutory rate	\$ 31,229	\$ 33,211	\$ 14,111
State income taxes, net of federal deduction	534	2,793	10
U.S. tax on foreign operations	5,786	9,666	5,805
Foreign derived intangible income deduction	(3,927)	(4,070)	—
Tax effect of foreign operations	(11,520)	(20,527)	(13,086)
Uncertain tax positions	(6,899)	(3,215)	(4,487)
Audit settlements	7,764	—	—
Unremitted earnings	261	(567)	1,624
Tax credits	(6,149)	(2,292)	(2,088)
Change in valuation allowance	(73)	(1,175)	7,222
Withholding taxes	756	4,265	6,500
Executive compensation limitation	1,926	1,070	356
Other permanent items, net	(5,684)	3,837	(5,268)
Total provision for income taxes	<u>\$ 14,004</u>	<u>\$ 22,996</u>	<u>\$ 10,699</u>

Deferred tax assets and liabilities are recognized for the future tax consequences of differences between the carrying amounts of assets and liabilities and their respective tax bases using enacted tax rates in effect for the year in which the differences are expected to be reversed. Significant deferred tax assets and liabilities consist of the following:

	Years Ended December 31,	
	2021	2020
Deferred tax assets		
Stock-based compensation	\$ 2,528	\$ 2,130
Net operating loss and tax credit carryforwards	54,210	57,590
Interest expense limitation	7,344	7,344
Pension obligation	10,778	14,297
Excess and obsolete inventory	3,325	3,722
Accrued restructuring	2,223	2,468
Deferred revenue	4,195	3,048
Employee bonuses and commissions	3,861	5,388
Amortization	26,358	28,786
Operating lease liabilities	19,405	20,267
Other	8,017	8,925
Deferred tax assets	<u>142,244</u>	<u>153,965</u>
Less: Valuation allowance	<u>(42,051)</u>	<u>(46,702)</u>
Net deferred tax assets	<u>100,193</u>	<u>107,263</u>
Deferred tax liabilities		
Depreciation and amortization	37,515	40,266
Unremitted earnings	4,435	4,173
Operating lease right-of-use assets	17,558	18,731
Other	3,364	3,380
Deferred tax liabilities	<u>62,872</u>	<u>66,550</u>
Net deferred tax assets	<u>\$ 37,321</u>	<u>\$ 40,713</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Of the \$37.3 million and \$40.7 million net deferred tax asset on December 31, 2021 and 2020, respectively, \$47.2 million and \$50.8 million is reflected as a net non-current deferred tax asset and \$9.9 million and \$10.1 million is reflected as a long-term liability on December 31, 2021 and 2020, respectively.

As of December 31, 2021, we have recorded a valuation allowance on \$4.0 million of our U.S. domestic deferred tax assets, largely attributable to state carryforward attributes that are expected to expire before sufficient income can be realized in those jurisdictions. The remaining valuation allowance on deferred tax assets approximates \$38.0 million and is associated primarily with operations in Germany, Hong Kong, and Switzerland. As of December 31, 2021, there is not sufficient positive evidence to conclude that such deferred tax assets, presently reduced by a valuation allowance, will be recognized. The December 31, 2021 valuation allowance balance reflects a decrease of \$4.7 million during the year. The change in the valuation allowance is primarily due to decreases from foreign exchange movements and current year activity.

As of December 31, 2021, we had U.S., foreign and state tax loss carryforwards of \$56.9 million, \$129.0 million, and \$117.1 million, respectively. Additionally, we had \$0.8 million and \$30.5 million of capital loss and interest expense limitation carryforwards, respectively. Finally, we had U.S. and state tax credit carryforwards of \$1.5 million and \$1.7 million, respectively. The U.S. and state net operating losses, tax credits, and interest expense limitation are subject to various utilization limitations under Section 382 of the Internal Revenue Code and applicable state laws. These Section 382 limited attributes have various expiration periods through 2036 or, in the case of the interest expense limitation amount, no expiration period. Much of the foreign jurisdiction, and \$8.0 million of the federal net operating loss carry forwards, have no expiration period.

We operate under a tax holiday in Singapore and China. These tax holidays are in effect through June 30, 2027 and December 31, 2022, respectively. The tax holiday is conditional upon our meeting certain employment and investment thresholds. The impact of the tax holidays decreased foreign taxes by \$13.3 million and \$13.0 million for 2021 and 2020, respectively. The benefit of the tax holiday on earnings per diluted share was \$0.35 and \$0.34 for 2021 and 2020, respectively.

As of December 31, 2021, we have undistributed earnings of certain foreign subsidiaries of approximately \$32.4 million that we have indefinitely invested, and on which we have not recognized deferred taxes. Estimating the amount of potential tax is not practicable because of the complexity and variety of assumptions necessary to compute the tax.

We account for uncertain tax positions by applying a minimum recognition threshold to tax positions before recognizing these positions in the financial statements. The reconciliation of our total gross unrecognized tax benefits is as follows:

	Years Ended December 31,		
	2021	2020	2019
Balance at beginning of period	\$ 9,673	\$ 13,009	\$ 13,162
Additions based on tax positions taken during a prior period	963	219	484
Additions based on tax positions taken during a prior period - acquisitions	—	—	4,479
Additions based on tax positions taken during the current period	566	—	—
Reductions based on tax positions taken during a prior period	—	—	(4,295)
Reductions related to a lapse of applicable statute of limitations	(4,575)	(3,555)	(821)
Reductions related to a settlement with taxing authorities	(1,114)	—	—
Balance at end of period	<u>\$ 5,513</u>	<u>\$ 9,673</u>	<u>\$ 13,009</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
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The unrecognized tax benefits of \$5.5 million, if recognized, will impact our effective tax rate. In accordance with our accounting policy, we recognize accrued interest and penalties related to unrecognized tax benefits as a component of tax expense. We had \$0.4 million and \$3.2 million of accrued interest and penalties on December 31, 2021 and 2020, respectively. With few exceptions, we are no longer subject to federal, state, or foreign income tax examinations by tax authorities for years before 2018.

NOTE 6. EARNINGS PER SHARE

We compute basic earnings per share ("EPS") by dividing income available to common stockholders by the weighted-average number of common shares outstanding during the period. The diluted EPS computation is similar to basic EPS except we increase the denominator to include the number of additional common shares that would have been outstanding (using the if-converted and treasury stock methods) if our outstanding stock options and restricted stock units had been converted to common shares (when such conversion is dilutive).

The following is a reconciliation of the weighted-average shares outstanding used in the calculation of basic and diluted earnings per share:

	<u>Years Ended December 31,</u>		
	<u>2021</u>	<u>2020</u>	<u>2019</u>
Income from continuing operations	\$ 134,707	\$ 135,151	\$ 56,495
Less: income from continuing operations attributable to noncontrolling interest	44	55	34
Income from continuing operations attributable to Advanced Energy Industries, Inc.	<u>\$ 134,663</u>	<u>\$ 135,096</u>	<u>\$ 56,461</u>
Basic weighted-average common shares outstanding	38,143	38,314	38,281
Assumed exercise of dilutive stock options and restricted stock units	212	228	214
Diluted weighted-average common shares outstanding	<u>38,355</u>	<u>38,542</u>	<u>38,495</u>
Continuing operations:			
Basic earnings per share	\$ 3.53	\$ 3.53	\$ 1.47
Diluted earnings per share	\$ 3.51	\$ 3.51	\$ 1.47

Share Repurchase

To execute the repurchase of shares of our common stock, we periodically enter into stock repurchase agreements. The following table summarizes these repurchases:

<u>(in thousands, except per share amounts)</u>	<u>Years Ended December 31,</u>	
	<u>2021</u>	<u>2020</u>
Amount paid to repurchase shares	\$ 78,125	\$ 11,630
Number of shares repurchased	901	244
Average repurchase price per share	\$ 86.76	\$ 47.75
Remaining authorized by Board of Directors for future repurchases as of period end	\$ 128,377	\$ 38,369

There were no shares repurchased from related parties. Repurchased shares were retired and assumed the status of authorized and unissued shares. On July 29, 2021, the Board of Directors approved an increase to the share repurchase program, which authorized the Company to repurchase up to \$200 million in shares of our common stock with no time limitation.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 7. FAIR VALUE MEASUREMENTS

The following tables present information about our assets and liabilities measured at fair value on a recurring basis.

Description	Balance Sheet Classification	December 31, 2021			Total Fair Value
		Level 1	Level 2	Level 3	
Assets:					
Certificates of deposit	Marketable securities	\$ —	2,296	—	\$ 2,296
Interest rate swaps	Deposits and other assets	—	2,739	—	2,739
Total assets measured at fair value on a recurring basis		<u>\$ —</u>	<u>\$ 5,035</u>	<u>\$ —</u>	<u>\$ 5,035</u>
Liabilities:					
Contingent consideration	Other current liabilities	\$ —	—	1,738	\$ 1,738
Total liabilities measured at fair value on a recurring basis		<u>\$ —</u>	<u>\$ —</u>	<u>\$ 1,738</u>	<u>\$ 1,738</u>
Description	Balance Sheet Classification	December 31, 2020			Total Fair Value
		Level 1	Level 2	Level 3	
Assets:					
Certificates of deposit	Marketable securities	\$ —	\$ 2,654	\$ —	\$ 2,654
Total assets measured at fair value on a recurring basis		<u>\$ —</u>	<u>\$ 2,654</u>	<u>\$ —</u>	<u>\$ 2,654</u>
Liabilities:					
Contingent consideration	Other current liabilities	\$ —	\$ —	\$ 2,009	\$ 2,009
Contingent consideration	Other long-term liabilities	—	—	2,940	2,940
Interest rate swaps	Other long-term liabilities	—	2,811	—	2,811
Total liabilities measured at fair value on a recurring basis		<u>\$ —</u>	<u>\$ 2,811</u>	<u>\$ 4,949</u>	<u>\$ 7,760</u>

The fair value of foreign currency forward contracts is based on the movement in the forward rates of foreign currency cash flows in which the hedging instrument is denominated. We determine the fair value of interest rate swaps by estimating the net present value of the expected cash flows based on market rates and associated yield curves, adjusted for non-performance credit risk, as applicable. See *Note 8. Derivative Financial Instruments* for additional information. The fair value of contingent consideration is determined by estimating the net present value of the expected cash flows based on the probability of expected payment. For all periods presented, there were no transfers into or out of Level 3.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 8. DERIVATIVE FINANCIAL INSTRUMENTS

Changes in foreign currency exchange rates impact us. We may manage these risks through the use of derivative financial instruments, primarily forward contracts with banks. These forward contracts manage the exchange rate risk associated with assets and liabilities denominated in nonfunctional currencies. These derivative instruments are typically executed for one-month periods and not designated as hedges; however, they do economically offset the fluctuations of our assets and liabilities due to foreign exchange rate changes.

Gains and losses related to foreign currency exchange contracts were offset by corresponding gains and losses on the revaluation of the underlying assets and liabilities. Both are included as a component of Other income (expense), net in our Consolidated Statements of Operations. As of December 31, 2021 and 2020, there were no foreign currency forward contracts outstanding.

In April 2020, we executed interest rate swap contracts with independent financial institutions to partially reduce the variability of cash flows in LIBOR indexed debt interest payments on our Term Loan Facility (under our existing Credit Agreement dated September 10, 2019, as amended). These transactions are accounted for as cash flow hedging instruments. The interest rate swap contracts fixed a portion of the outstanding principal balance on our term loan to a total interest rate of 1.271%. This is comprised of 0.521% average fixed rate per annum in exchange for a variable interest rate based on one-month USD-LIBOR-BBA plus the credit spread in our existing Credit Agreement, which is 75 basis points at current leverage ratios.

The following table summarizes the notional amount of our qualified hedging instruments:

	December 31, 2021	December 31, 2020
Interest rate swap contracts	\$ 255,719	\$ 273,219

The following table summarizes the amounts recorded in Accumulated other comprehensive loss on the Consolidated Balance Sheets for qualifying hedges.

	December 31, 2021	December 31, 2020
Interest rate swap contracts - gains (losses)	\$ 2,107	\$ (2,139)

See *Note 7. Fair Value Measurements* for information regarding fair value of derivative instruments.

As a result of using derivative financial instruments, we are exposed to the risk that counterparties to contracts could fail to meet their contractual obligations. We manage this risk by reviewing counterparty creditworthiness on a regular basis and limiting exposure to any single counterparty.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 9. ACCOUNTS AND OTHER RECEIVABLE, NET

We record accounts and other receivable at net realizable value. Components of accounts and other receivable, net of reserves, were as follows:

	December 31, 2021	December 31, 2020
Amounts billed, net	\$ 217,549	\$ 213,560
Unbilled receivables	19,678	21,618
Total receivables, net	<u>\$ 237,227</u>	<u>\$ 235,178</u>

"Amounts billed, net" represents amounts invoiced to customers in accordance with our terms and conditions and reflects an allowance for expected credit losses. These receivables are short term in nature and do not include any financing components.

"Unbilled receivables" consist of amounts where we satisfied our contractual obligations associated with customer inventory stocking agreements. Such amounts typically become billable upon the customer's consumption of the inventory. We anticipate invoicing and collecting substantially all unbilled receivables within the next twelve months.

The following table summarizes the changes in expected credit losses:

	December 31, 2021	December 31, 2020
Balance at beginning of period	\$ 7,602	\$ 7,745
Additions	135	368
Deductions - write-offs, net of recoveries	(687)	(511)
Foreign currency translation	(18)	—
Other	(1,248)	—
Balance at end of period	<u>\$ 5,784</u>	<u>\$ 7,602</u>

NOTE 10. INVENTORIES

We value inventories at the lower of cost or net realizable value and computed on a first-in, first-out basis. Components of inventories were as follows:

	December 31, 2021	December 31, 2020
Parts and raw materials	\$ 261,365	\$ 141,337
Work in process	24,222	13,702
Finished goods	52,823	66,307
Total	<u>\$ 338,410</u>	<u>\$ 221,346</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 11. PROPERTY AND EQUIPMENT, NET

Property and equipment, net is comprised of the following:

	Estimated Useful Life (in years)	December 31, 2021	December 31, 2020
Buildings	25	\$ 1,625	\$ 1,776
Machinery and equipment	5 to 8	133,010	115,404
Computer equipment, furniture, fixtures, and vehicles	3 to 5	33,490	31,237
Leasehold improvements	2 to 10	48,370	42,984
Construction in process		5,914	3,693
		222,409	195,094
Less: Accumulated depreciation		(107,579)	(80,363)
Property and equipment, net		<u>\$ 114,830</u>	<u>\$ 114,731</u>

The following table summarizes depreciation expense. All depreciation expense is recorded in income from continuing operations.

	Years Ended December 31,		
	2021	2020	2019
Depreciation expense	\$ 30,833	\$ 27,641	\$ 13,979

NOTE 12. GOODWILL

The following table summarizes the changes in goodwill:

	December 31, 2021	December 31, 2020
Balance at beginning of period	\$ 209,983	\$ 202,932
Measurement period adjustments to purchase price allocations	(1,426)	1,957
Additions from acquisition	5,877	1,749
Foreign currency translation	(2,244)	3,345
Balance at end of period	<u>\$ 212,190</u>	<u>\$ 209,983</u>

Additions and adjustments are the result of business combinations. Refer to *Note 2. Acquisitions*.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 13. INTANGIBLE ASSETS

Intangible assets consisted of the following:

	December 31, 2021		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Technology	\$ 91,461	\$ (35,854)	\$ 55,607
Customer relationships	118,706	(34,187)	84,519
Trademarks and other	27,244	(7,964)	19,280
Total	\$ 237,411	\$ (78,005)	\$ 159,406

	December 31, 2020		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Technology	\$ 85,075	\$ (24,999)	\$ 60,076
Customer relationships	114,171	(26,880)	87,291
Trademarks and other	27,021	(5,449)	21,572
Total	\$ 226,267	\$ (57,328)	\$ 168,939

At December 31, 2021, the weighted average remaining useful life of intangibles subject to amortization was approximately 9.8 years.

Amortization expense related to intangible assets was as follows:

	Years Ended December 31,		
	2021	2020	2019
Amortization expense	\$ 22,060	\$ 20,129	\$ 12,168

Estimated amortization expense related to intangibles is as follows:

Year Ending December 31,	
2022	22,025
2023	22,007
2024	19,148
2025	14,653
2026	12,937
Thereafter	68,636
Total	\$ 159,406

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 14. RESTRUCTURING COSTS

During 2018, we committed to a restructuring plan to optimize our manufacturing footprint and to improve our operating efficiencies and synergies related to our recent acquisitions. For the periods presented, we incurred severance costs primarily related to the transition and exit of our facility in Shenzhen, PRC and actions associated with synergies related to the Artesyn acquisition. The table below summarizes restructuring charges:

	<u>Years Ended December 31,</u>		
	<u>2021</u>	<u>2020</u>	<u>2019</u>
Severance and related charges	\$ 3,467	\$ 9,632	\$ 3,042
Facility relocation and closure charges	1,285	3,534	1,996
Total restructuring charges	<u>\$ 4,752</u>	<u>\$ 13,166</u>	<u>\$ 5,038</u>
			Cumulative Cost Through December 31, 2021
Severance and related charges			\$ 20,380
Facility relocation and closure charges			6,815
Total restructuring charges			<u>\$ 27,195</u>

Our restructuring liabilities are included in other accrued expenses in our Consolidated Balance Sheets and related primarily to severance and associated costs. Changes in restructuring liabilities were as follows:

	<u>December 31, 2021</u>	<u>December 31, 2020</u>
Balance at beginning of period	\$ 10,641	\$ 2,172
Costs incurred and charged to expense	4,752	13,166
Costs paid or otherwise settled	(6,127)	(4,714)
Effects of changes in exchange rate	(3)	17
Balance at end of period	<u>\$ 9,263</u>	<u>\$ 10,641</u>

NOTE 15. WARRANTIES

Our sales agreements include customary product warranty provisions, which range from 12 to 24 months after shipment. We record the estimated warranty obligations cost when we recognize revenue. This estimate is based on historical experience by product and configuration.

Our estimated warranty obligation is included in other accrued expenses in our Consolidated Balance Sheets. Changes in our product warranty obligation were as follows:

	<u>Years Ended December 31,</u>	
	<u>2021</u>	<u>2020</u>
Balance at beginning of period	\$ 4,780	\$ 6,413
Warranty acquired in business combinations	—	15
Increases to accruals	3,165	2,996
Warranty expenditures	(4,587)	(4,688)
Effect of changes in exchange rates	(8)	44
Balance at end of period	<u>\$ 3,350</u>	<u>\$ 4,780</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 16. LEASES

Components of operating lease cost were as follows:

	Years Ended December 31,		
	2021	2020	2019
Operating lease cost	\$ 23,443	\$ 22,920	\$ 11,052
Short-term and variable lease cost	2,555	1,895	4,726
Total operating lease cost	<u>\$ 25,998</u>	<u>\$ 24,815</u>	<u>\$ 15,778</u>

Maturities of our operating lease liabilities are as follows:

Year Ending December 31,	
2022	\$ 20,416
2023	17,230
2024	14,812
2025	12,426
2026	11,079
Thereafter	65,785
Total lease payments	141,748
Less: Interest	(30,725)
Present value of lease liabilities	<u>\$ 111,023</u>

We have lease agreements that commence in the future between 2022 and 2023 with total payments of \$4.3 million through 2029.

	Year Ended December 31,	
	2021	2020
Weighted average remaining lease term (in years)	9.81	10.65
Weighted average discount rate	4.51 %	4.63 %

	Year Ended December 31,		
	2021	2020	2019
Cash paid for operating leases	\$ 23,668	\$ 21,877	\$ 12,101
Right-of-use assets obtained in exchange for operating lease liabilities	\$ 16,399	\$ 33,741	\$ 84,551

NOTE 17. EMPLOYEE RETIREMENT PLANS AND POSTRETIREMENT BENEFITS

Defined Contribution Plans

We have a 401(k) profit-sharing and retirement savings plan covering substantially all full-time U.S. employees. Participants may defer up to the maximum amount allowed permitted by law. Effective January 1, 2022, participants are immediately vested in both their own contributions and profit-sharing contributions. Profit-sharing contributions, which are discretionary, are approved by the Board of Directors. For the years ended December 31, 2021, 2020, and 2019 we based our profit-sharing contribution on matching 50% of employee contributions up to 6% of the employee's compensation.

During the years ended December 31, 2021, 2020, and 2019 we recognized total defined contribution plan costs of \$3.1 million, \$2.6 million, and \$1.6 million, respectively.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
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Defined Benefit Plan

We maintain defined benefit pension plans for certain of our non-U.S. employees in the U.K., Germany, and Philippines. Each plan is managed locally and in accordance with respective local laws and regulations.

To measure the expense and related benefit obligation, we make various assumptions, including discount rates used to value the obligation, expected return on plan assets used to fund these expenses, and estimated future inflation rates. We base these assumptions on historical experience as well as facts and circumstances. We use an actuarial analysis to measure the expense and liability associated with pension benefits.

The information provided below includes one pension plan which is part of discontinued operations. As such, for all periods presented, all related expenses are reported in discontinued operations in the Consolidated Statements of Operations.

Our projected benefit obligation and plan assets for defined benefit pension plans and the related assumptions used to determine the related liabilities are as follows:

	Years Ended December 31,	
	2021	2020
Projected benefit obligation, beginning of year	\$ 97,740	\$ 83,262
Service cost	1,282	1,068
Interest cost	1,452	1,716
Actuarial (gain) loss	(8,682)	7,591
Benefits paid	(2,010)	(1,199)
Translation adjustment	(4,006)	5,302
Projected benefit obligation, end of year	<u>\$ 85,776</u>	<u>\$ 97,740</u>
Fair value of plan assets, beginning of year	\$ 17,293	\$ 14,903
Actual return on plan assets	641	682
Contributions	1,775	1,827
Benefits paid	(1,112)	(993)
Actuarial gain	71	180
Translation adjustment	(147)	694
Fair value of plan assets, end of year	<u>\$ 18,521</u>	<u>\$ 17,293</u>
Funded status of plan	<u>\$ (67,255)</u>	<u>\$ (80,447)</u>

The components of net periodic pension benefit cost recognized in our Consolidated Statements of Operations for the periods presented are as follows:

	Years Ended December 31,		
	2021	2020	2019
Service cost	\$ 1,282	\$ 1,068	\$ 272
Interest cost	1,452	1,716	1,211
Expected return on plan assets	(642)	(683)	(615)
Amortization of actuarial gains and losses	820	459	411
Net periodic pension cost	<u>\$ 2,912</u>	<u>\$ 2,560</u>	<u>\$ 1,279</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Assumptions used in the determination of the net periodic pension cost are:

	Years Ended December 31,		
	2021	2020	2019
Discount rate	1.6 %	1.8 %	2.7 %
Expected long-term return on plan assets	3.2 %	3.7 %	4.6 %

The fair value of our qualified pension plan assets by category was as follows:

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
Diversified Growth Fund	\$ —	\$ 12,249	\$ —	\$ 12,249
Corporate Bonds	—	4,640	—	4,640
Insurance Contracts	—	—	984	984
Cash	648	—	—	648
Total	\$ 648	\$ 16,889	\$ 984	\$ 18,521

	December 31, 2020			
	Level 1	Level 2	Level 3	Total
Multi-Asset Fund	\$ —	\$ 5,149	\$ —	\$ 5,149
Diversified Growth Fund	—	5,134	—	5,134
Corporate Bonds	—	4,906	—	4,906
Insurance Contracts	—	—	1,109	1,109
Cash	995	—	—	995
Total	\$ 995	\$ 15,189	\$ 1,109	\$ 17,293

On December 31, 2021, our plan's assets of \$18.5 million were invested in cash plus three separate funds including, a diversified growth fund (66.1%), corporate bonds (25.1%), and insurance contracts (5.3%). The growth fund aims to generate an "equity-like" return over an economic cycle with significantly reduced volatility relative to equity markets and has the scope to use a diverse range of asset classes, including equities, bonds, cash, and alternatives (e.g., property, infrastructure, high yield bonds, floating rate debt, private, equity, hedge funds and currency). These investments are intended to provide a degree of protection against changes in the value of our plan's liabilities related to changes in long-term expectations for interest rates and inflation expectations.

Expected future payments during the next ten years for our defined benefit pension plans are as follows:

Year Ending December 31,	
2022	\$ 1,778
2023	2,068
2024	2,847
2025	2,299
2026	5,395
2027 to 2031	18,739

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 18. STOCK-BASED COMPENSATION

As of December 31, 2021, we had two active stock-based incentive compensation plan: the 2017 Omnibus Incentive Plan ("the 2017 Plan") and the Employee Stock Purchase Plan ("ESPP"). We issue all new equity compensation grants under these two plans; however, outstanding awards previously issued under inactive plans will continue to vest and remain exercisable in accordance with the terms of the respective plans. Our stock plans are administered by the Board of Directors Compensation Committee. On December 31, 2021, there were 3.3 million shares reserved and 2.6 million shares available for future grant under our stock-based incentive plans.

On May 4, 2017, the stockholders approved the 2017 Plan, and all shares that were then available for issuance under the 2008 Omnibus Incentive Plan ("the 2008 Plan") are now available for issuance under the 2017 Plan. The 2017 Plan and 2008 Plan provide for the grant of stock options, stock appreciation rights, restricted stock, stock units (including deferred stock units), unrestricted stock, and dividend equivalent rights. Any of the awards issued may be issued as performance-based awards to align stock compensation awards to the attainment of annual or long-term performance goals. As of December 31, 2021, there were 1.9 million shares available for grant under the 2017 Plan.

Stock-based Compensation Expense

We recognize stock-based compensation expense based on the fair value of the awards issued and the functional area of the employee receiving the award. Stock-based compensation was as follows:

	Years Ended December 31,		
	2021	2020	2019
Equity classified awards	\$ 15,428	\$ 12,272	\$ 7,327
Liability classified awards	311	—	—
Stock-based compensation expense	<u>\$ 15,739</u>	<u>\$ 12,272</u>	<u>\$ 7,327</u>

Estimated forfeiture rates for our stock-based compensation expense applicable to stock options and RSUs were approximately 8%, 5% and 10% for the years ended December 31, 2021, 2020 and 2019, respectively.

Restricted Stock Units

Generally, we grant RSUs with a three-year time-based vesting schedule. Certain RSUs contain performance-based or market-based vesting conditions in addition to the time-based vesting requirements.

Changes in our unvested RSUs were as follows:

	Year Ended December 31, 2021	
	Number of RSUs	Weighted- Average Grant Date Fair Value
RSUs outstanding at beginning of period	608	\$ 58.15
RSUs granted	406	\$ 94.60
RSUs vested	(178)	\$ 62.82
RSUs forfeited	(209)	\$ 70.34
RSUs outstanding at end of period	<u>627</u>	<u>\$ 76.37</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

The total intrinsic value of RSUs converted to shares for the years ended December 31, 2021, 2020 and 2019 were \$19.2 million, \$9.2 million, and \$8.3 million, respectively. As of December 31, 2021, there was \$21.4 million of total unrecognized compensation cost, net of expected forfeitures related to non-vested RSUs granted, which is expected to be recognized through December 2024, with a weighted-average remaining vesting period of 1.1 years.

Stock Options

Generally, we grant stock option awards with an exercise price equal to the market price of our stock at the date of grant and with either a three or four-year vesting schedule or performance-based vesting; however, no stock options were granted in 2021. Stock option awards generally have a term of ten years.

Changes in our stock options were as follows:

	<u>Year Ended December 31, 2021</u>	
	<u>Number of Options</u>	<u>Weighted-Average Exercise Price per Share</u>
Options outstanding at beginning of period	147	\$ 23.63
Options exercised	(35)	\$ 21.10
Options outstanding at end of period	<u>112</u>	<u>\$ 24.41</u>

The total intrinsic value of options exercised for the years ended December 31, 2021, 2020 and 2019 was \$2.6 million, \$1.9 million, and \$1.6 million, respectively. All options outstanding on December 31, 2021 are vested and have aggregate intrinsic value of \$7.5 million and weighted-average remaining contractual life of 3.0 years.

The following table summarizes information about the stock options outstanding on December 31, 2021:

<u>Range of Exercise Prices</u>	<u>Options Outstanding and Exercisable</u>		
	<u>Number Outstanding (In 000's)</u>	<u>Weighted-Average Remaining Contractual Life</u>	<u>Weighted-Average Exercise Price</u>
\$18.77	28	2.75 years	\$ 18.77
\$26.32	84	3.10 years	\$ 26.32
\$18.77 to \$26.32	<u>112</u>	<u>3.01 years</u>	<u>\$ 24.41</u>

Employee Stock Purchase Plan

The ESPP, a stockholder-approved plan, provides for the issuance of rights to purchase up to 1,000,000 shares of common stock. In May 2010, stockholders approved an increase from 500,000 to 1,000,000 shares authorized for sale under our ESPP. Employees below the Vice President level are eligible to participate in the ESPP if employed by us for at least 20 hours per week during at least five months per calendar year. Participating employees may contribute up to the lesser of 15% of their eligible earnings or \$5,000 during each plan period. Currently, the plan period is six months. The purchase price of common stock purchased under the ESPP is currently equal to the lower of 1) 85% of the fair market value of our common stock on the commencement date of each plan period or 2) 85% of the fair market value of our common shares on each plan period purchase date. On December 31, 2021, 0.7 million shares remained available for future issuance under the ESPP.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Purchase rights granted under the ESPP are valued using the Black-Scholes-Merton model. As of December 31, 2021, there was \$0.6 million of total unrecognized compensation cost related to the ESPP that we expect to recognize over a remaining period of five months. The following table summarizes compensation expense related to the ESPP.

	Years Ended December 31,		
	2021	2020	2019
Stock-based compensation expense related to the ESPP	\$ 1,114	\$ 856	\$ 475

The fair value of each purchase right granted under the ESPP was estimated on the date of grant using the Black-Scholes-Merton option pricing model with the following assumptions:

	Years Ended December 31,		
	2021	2020	2019
Risk-free interest rates	0.04% - 0.10 %	0.10% - 0.18% %	1.62% - 2.31 %
Expected dividend yield rates	— %	— %	— %
Expected term	0.5 years	0.5 years	0.5 years
Expected volatility	42.7 %	70.1 %	41.3 %

The risk-free interest rate is based on the six-month U.S. Treasury Bill at the time of the grant. Our term is 0.5 years as purchases are made biannually. We utilize our historical experience in determining the volatility of our common stock over the expected term.

NOTE 19. COMMITMENTS AND CONTINGENCIES

We are 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 also 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. 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. We are not currently a party to any legal action that we believe would reasonably have a material adverse impact on our business, financial condition, results of operations or cash flows.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 20. GEOGRAPHIC AND SIGNIFICANT CUSTOMER INFORMATION

The following table summarizes sales and percentages of total sales from customers who individually accounted for 10% or more of our sales:

	Years Ended December 31,					
	2021		2020		2019	
Applied Materials, Inc.	\$ 296,369	20.4 %	\$ 248,350	17.5 %	\$ 164,724	20.9 %
Lam Research Corporation	147,385	10.1 %	141,778	10.0 %	88,251	11.2 %

The following table summarizes the accounts receivable balances and percentages of the total accounts receivable from customers who individually accounted for 10% or more of accounts receivable:

	December 31, 2021		December 31, 2020	
	Applied Materials, Inc.	\$ 42,425	17.9 %	\$ 33,402
Nidec Motor Corporation	*	* %	\$ 24,344	10.4 %

* Customer's balance was less than 10% of total

Our sales to Applied Materials, Inc. and Lam Research Corporation are reflected in the Semiconductor Equipment and Industrial and Medical market. Our sales to Nidec Motor Corporation are reflected in the Industrial and Medical market. For more information on our markets, see *Note 3. Revenue*.

No other customer accounted for 10% or more of our sales or accounts receivable balances during these periods.

The following table summarizes long-lived assets by geographic area:

	December 31,	
	2021	2020
United States	\$ 255,791	\$ 253,115
Asia	275,260	283,549
Europe	57,144	60,847
Total	<u>\$ 588,195</u>	<u>\$ 597,511</u>

Long-lived assets include property and equipment, operating lease right-of-use assets, goodwill, and intangible assets.

NOTE 21. CREDIT FACILITY

In September 2019, in connection with the Artesyn Acquisition Agreement, we entered into a credit agreement ("Credit Agreement") that provided aggregate financing of \$500.0 million, consisting of a \$350.0 million senior unsecured term loan facility (the "Term Loan Facility") and a \$150.0 million senior unsecured revolving facility (the "Revolving Facility" and together with the Term Loan Facility, the "Credit Facility").

In September 2021, we amended the Credit Agreement whereby we borrowed an additional \$85.0 million, which increased the aggregate amount outstanding under the Term Loan Facility to \$400.0 million. In addition, we increased the Revolving Facility capacity by \$50.0 million to \$200.0 million. Both the Term Loan Facility and Revolving Facility mature on September 9, 2026.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

The following table summarizes borrowings under our Credit Facility and the associated interest rate.

	December 31, 2021		
	Balance	Interest Rate	Unused Line Fee
Term Loan Facility subject to a fixed interest rate	\$ 255,719	1.271%	—
Term Loan Facility subject to a variable interest rate	139,281	0.890%	—
Revolving Facility subject to a variable interest rate	—	0.890%	0.10%
Total borrowings under the Credit Agreement	<u>\$ 395,000</u>		

For more information on the interest rate swap that fixes the interest rate for a portion of our Term Loan Facility, see *Note 8. Derivative Financial Instruments*. The Term Loan Facility and Revolving Facility bear interest, at our option, at a rate based on a reserve adjusted "Eurodollar Rate" or "Base Rate," as defined in the Credit Agreement, plus an applicable margin.

For all periods presented, we were in compliance with the Credit Agreement covenants. As of December 31, 2021 and December 31, 2020, we had \$200.0 million and \$150.0 million, respectively, available to withdraw on the Revolving Facility.

The fair value of the Term Loan Facility approximates the outstanding balance of \$395.0 million as of December 31, 2021.

The debt obligation on our Consolidated Balance Sheets consists of the following:

	December 31, 2021	December 31, 2020
Term Loan Facility	\$ 395,000	\$ 323,750
Less: debt issuance costs	(2,267)	(1,704)
Total debt	392,733	322,046
Less current portion of long-term debt	(20,000)	(17,500)
Total long-term debt	<u>\$ 372,733</u>	<u>\$ 304,546</u>

Contractual maturities of our debt obligations, excluding amortization of debt issuance costs, are as follows:

Year Ending December 31,	
2022	\$ 20,000
2023	20,000
2024	20,000
2025	20,000
2026	315,000
Total	<u>\$ 395,000</u>

Interest expense and unused line of credit fees were recorded in Other income (expense), net in our Consolidated Statements of Operations as follows:

	Years Ended December 31,		
	2021	2020	2019
Interest expense	\$ 3,969	\$ 5,080	\$ 2,994
Amortization of debt issuance costs	822	519	186
Unused line of credit fees and other	168	153	236
Total interest expense	<u>\$ 4,959</u>	<u>\$ 5,752</u>	<u>\$ 3,416</u>

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

Not applicable.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We have established disclosure controls and procedures, which are designed to ensure that information required to be disclosed in reports filed or submitted under the Securities Exchange Act of 1934 ("Act") is recorded, processed, summarized, and reported, within the time periods specified in the Securities and Exchange Commission's rules and forms. These disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed in the reports that we file or submit under the Act is accumulated and communicated to management, including our Principal Executive Officer (Stephen D. Kelley, President and Chief Executive Officer) and Principal Financial Officer (Paul Oldham, Chief Financial Officer), as appropriate, to allow timely decisions regarding required disclosures.

As of the end of the period covered by this report, we conducted an evaluation, with the participation of management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of the disclosure controls and procedures pursuant to the Exchange Act Rule 13a-15(b). Based upon this evaluation, the Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2021. The conclusions of the Chief Executive Officer and Chief Financial Officer from this evaluation were communicated to the Audit Committee. We intend to continue to review and document our disclosure controls and procedures, including our internal controls over financial reporting, and may from time to time make changes aimed at enhancing their effectiveness and to ensure that our systems evolve with our business.

Management's Annual Report on Internal Control over Financial Reporting

It is management's responsibility to establish and maintain effective internal control over our financial reporting, which is a process designed under the supervision of our Chief Executive Officer and Chief Financial Officer and effected by our Board of Directors, management, and other personnel. Our internal control over financial reporting is designed to provide reasonable assurance concerning the reliability of our financial reporting and the preparation of our financial statements for external purposes in accordance with generally accepted accounting principles.

In June 2021, we acquired TEGAM, Inc. Refer to *Note 2. Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data" for additional information. TEGAM's objectives regarding internal controls over financial reporting are consistent, in all material respects, with Advanced Energy's objectives. We are in the process of completing a more comprehensive review of TEGAM's internal control over financial reporting and will be implementing changes to better align their reporting and controls with the rest of Advanced Energy. As a result of the timing of the acquisition, anticipated changes, and general guidance issued by the SEC regarding exclusion of certain acquired businesses, we excluded TEGAM from Advanced Energy's December 31, 2021 assessment of internal controls over financial reporting. TEGAM accounted for approximately 1% of our total assets at December 31, 2021, and 1% of our total net sales for the year ended December 31, 2021.

Management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our internal control over financial reporting as of December 31, 2021, using the criteria described in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based upon this evaluation, management concluded that our internal control over financial reporting was effective as of December 31, 2021.

Ernst & Young LLP, an independent registered public accounting firm, has audited our consolidated financial statements included in this Form 10-K, and as part of the audit, has issued an audit report, included herein, on the effectiveness of our internal control over financial reporting as of December 31, 2021.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting that occurred during 2021 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Limitations on Controls and Procedures

Management has concluded that our disclosure controls and procedures and internal control over financial reporting provide reasonable assurance that the objectives of our control system are met. We do not expect, however, that our disclosure controls and procedures or internal control over financial reporting will prevent or detect all misstatements, errors, or fraud, if any. All control systems, no matter how well designed and implemented, have inherent limitations, and therefore no evaluation can provide absolute assurance that every misstatement, error, or instance of fraud, if any, or risk thereof, has been or will be prevented or detected. The occurrence of a misstatement, error, or fraud, if any, would not necessarily require a conclusion that our controls and procedures are not effective.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Advanced Energy Industries, Inc.

Opinion on Internal Control Over Financial Reporting

We have audited Advanced Energy Industries, Inc.'s internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Advanced Energy Industries, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on the COSO criteria.

As indicated in the accompanying Management's Annual Report on Internal Control over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of TEGAM, Inc., which is included in the 2021 consolidated financial statements of the Company and constituted 1% and 2% of total and net assets, respectively, as of December 31, 2021 and 0.6% and 0.5% of revenues and net income, respectively, for the year then ended. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of TEGAM, Inc.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2021, and the related notes and our report dated March 16, 2022 expressed an unqualified opinion thereon.

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 Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

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

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

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

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

/s/ Ernst & Young LLP

Denver, Colorado
March 16, 2022

ITEM 9B. OTHER INFORMATION

Not applicable.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

In accordance with General Instruction G(3) of Form 10-K, certain information required by this Part III is incorporated by reference to the definitive proxy statement relating to our 2022 annual meeting of stockholders (the "2022 Proxy Statement"), as set forth below. The 2022 Proxy Statement will be filed with the Securities and Exchange Commission within 120 days after the end of our fiscal year.

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

The information set forth in the 2022 Proxy Statement under the headings "Management" and "Proposal No. 1 - Election of Directors" is incorporated herein by reference.

We adopted a Code of Ethical Conduct that applies to all employees, including our Chief Executive Officer, Chief Financial Officer, and others performing similar functions. We posted a copy of the Code of Ethical Conduct on our website at www.advancedenergy.com, and such Code of Ethical Conduct is available, in print, without charge, to any stockholder who requests it from the Company's Secretary. We intend to satisfy the disclosure requirements under Item 5.05 of Form 8-K regarding amendments to, or waivers from, the Code of Ethical Conduct by posting such

information on our website at www.advancedenergy.com. We are not including the information contained on our website as part of, or incorporating it by reference into, this report.

ITEM 11. EXECUTIVE COMPENSATION

The information set forth in the 2022 Proxy Statement under the headings "Executive Compensation" is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information set forth in the 2022 Proxy Statement under the headings "Security Ownership of Certain Beneficial Owners and Management" and "Equity Compensation Plan Information" is incorporated herein by reference.

Securities Authorized for Issuance under Equity Compensation Plans

The following table summarizes information about the equity incentive compensation plans as of December 31, 2021. All outstanding awards relate to our common stock.

Plan Category	(A)	(B)	(C)
	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column A)
		(in thousands, except exercise price per share)	
Equity compensation plans approved by security holders	112	\$ 24.41	2,554 (1)
Equity compensation plans not approved by security holders	—	—	—
Total	112	\$ 24.41	2,554

(1) This number includes 665 thousand shares available for future issuance under the Employee Stock Purchase Plan

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Not applicable.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information set forth in the 2022 Proxy Statement under the caption "Proposal No. 2 - Ratification of the Appointment of Ernst & Young LLP as Advanced Energy's Independent Registered Public Accounting Firm for 2022" is incorporated herein by reference.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(A) Documents filed as part of this Annual Report on Form 10-K are as follows:

1. Financial Statements:

See Index to Financial Statements at Part II, Item 8 herein.

2. Financial Statement Schedules for the years ended December 31, 2021, 2020 and 2019

NOTE: All schedules have been omitted because they are either not applicable or the required information is included in the financial statements and notes thereto.

(B) Exhibits:

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
2.1	Stock Purchase Agreement by and among Advanced Energy Industries, Inc., Artesyn Embedded Technologies, Inc., Pontus Intermediate Holdings II, LLC and Pontus Holdings, LLC, dated May 14, 2019 **	8-K	000 - 26966	2.1	May 15, 2019
2.2	First Amendment to the Stock Purchase Agreement by and among Advanced Energy Industries, Inc., Artesyn Embedded Technologies, Inc., Pontus Intermediate Holdings II, LLC and Pontus Holdings, LLC, dated September 9, 2019 **	8-K	000 - 26966	2.2	September 10, 2019
3.1	Amended and Restated Certificate of Incorporation of Advanced Energy Industries, Inc.	10-Q	000 - 26966	3.1	August 5, 2019
3.2	Second Amended and Restated By-Laws of Advanced Energy Industries, Inc.	8-K	000 - 26966	3.1	May 20, 2020
4.1	Form of Specimen Certificate for Common Stock	S-1	33 - 97188	4.1	September 21, 1995
4.2	Description of Advanced Energy Industries, Inc. Securities	10-K	000 - 26966	4.2	March 2, 2020
10.1	Lease dated January 16, 2003, by and between China Great Wall Computer Shenzhen Co., Ltd., Great Wall Limited and Advanced Energy Industries (Shenzhen) Co., Ltd., for a building located in Shenzhen, China	10-K	000 - 26966	10.18	February 24, 2004
10.2	Form of Indemnification Agreement	S-1	33 - 97188	10.2	September 21, 1995
10.3	Form of Director Indemnification Agreement	8-K	000 - 26966	10.1	December 14, 2009
10.4	Form of Notice of Grant for Restricted Stock Unit *	8-K	000 - 26966	10.1	May 10, 2013
10.5	Form of Restricted Stock Unit Agreement *	8-K	000 - 26966	10.2	May 10, 2013
10.6	Form of Notice of Grant of Stock Option *	8-K	000 - 26966	10.3	May 10, 2013
10.7	Form of Incentive Stock Option Agreement *	8-K	000 - 26966	10.4	May 10, 2013
10.8	Form of Non-Qualified Stock Option Agreement *	8-K	000 - 26966	10.5	May 10, 2013
10.9	Form of LTI Notice of Grant *	8-K	000 - 26966	10.6	May 10, 2013
10.10	Form of LTI Performance Stock Option Agreement pursuant to the 2008 Omnibus Incentive Plan *	8-K	000 - 26966	10.7	May 10, 2013
10.11	Form of LTI Performance Stock Unit Agreement pursuant to the 2008 Omnibus Incentive Plan *	8-K	000 - 26966	10.8	May 10, 2013

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
10.12	Form of 2020 Short-Term Incentive Plan *	10-K	000 - 26966	10.13	March 2, 2020
10.13	2017 Long-Term Incentive (LTI) Plan *	DEF 14A	000 - 26966	Appendix A	March 14, 2017
10.14	2017 Short-Term Incentive (STI) Plan *	DEF 14A	000 - 26966	Appendix B	March 14, 2017
10.15	2017 Omnibus Incentive Plan *	DEF 14A	000 - 26966	Appendix A	March 14, 2017
10.16	2008 Omnibus Incentive Plan, as amended May 4, 2010 *	10-K	000 - 26966	10.37	March 2, 2011
10.17	Employee Stock Purchase Plan *	S-1	33 - 97188	10.17	September 21, 1995
10.18	Transition and Retirement Agreement dated February 8, 2021 *	8-K	000 - 26966	10.1	February 10, 2021
10.19	Offer Letter dated February 8, 2021 *	8-K	000-26966	10.2	February 10, 2021
10.20	Global Supply Agreement by and between Advanced Energy Industries, Inc. and Applied Materials, Inc. dated August 29, 2005 +	10-Q	000 - 26966	10.1	November 7, 2005
10.21	Shipping Amendment to the Global Supply Agreement by and between Advanced Energy Industries, Inc. and Applied Materials, Inc. dated August 29, 2005 +	10-Q	000 - 26966	10.2	November 7, 2005
10.22	Bridge Amendment to the Global Supply Agreement by and between Advanced Energy Industries, Inc. and Applied Materials, Inc. dated January 28, 2011 +	10-Q	000 - 26966	10.1	May 6, 2011
10.23	Fixed Dollar Accelerated Share Repurchase Transaction, dated November 6, 2015, between Advanced Energy Industries, Inc. and Morgan Stanley & Co. LLC.	8-K	000 - 26966	10.1	November 6, 2015
10.24	Offer Letter to Paul Oldham, dated March 26, 2018 *	8-K	000 - 26966	10.1	March 29, 2018
10.25	Form of Executive Change in Control and General Severance Agreement	8-K	000 - 26966	10.1	August 6, 2018
10.26	Credit Agreement, dated September 10, 2019, by and among Advanced Energy Industries, Inc., Bank of America N.A. as the Administrative Agent, Bank of America N.A., Bank of the West and HSBC Bank USA, N.A. as the Joint Lead Arrangers and Joint Book Runners, and Citibank N.A., as the Co-Manager	8-K	000 - 26966	10.1	September 10, 2019
10.27	ISDA 2002 Master Agreement, by and between Advanced Energy Industries, Inc. and HSBC Bank USA, National Association, dated as of April 2, 2020 (the "HSBC ISDA Master Agreement")	8-K	000 - 26966	10.1	April 10, 2020

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
10.28	ISDA 2002 Master Agreement, by and between Advanced Energy Industries, Inc. and Citibank, N.A., dated as of April 7, 2020 (the "Citibank ISDA Master Agreement")	8-K	000 - 26966	10.2	April 10, 2020
10.29	Schedule to the HSBC ISDA Master Agreement	8-K	000 - 26966	10.3	April 10, 2020
10.30	Schedule to the Citibank ISDA Master Agreement	8-K	000 - 26966	10.4	April 10, 2020
10.31	Rate Swap Transaction Confirmation, by and between Advanced Energy Industries, Inc. and HSBC Bank USA, National Association, dated April 7, 2020	8-K	000 - 26966	10.5	April 10, 2020
10.32	Rate Swap Transaction Confirmation, by and between Advanced Energy Industries, Inc. and Citibank, N.A., dated April 9, 2020	8-K	000 - 26966	10.6	April 10, 2020
10.33	Amendment No. 1 to Credit Agreement, dated September 9, 2021, by and among Advanced Energy Industries, Inc., the guarantors party thereto, Bank of America N.A. as the Administrative Agent, and the lenders party thereto (which included the marked Credit Agreement as Exhibit A thereto)	8-K	000-26966	10.2	September 9, 2021
10.34	Offer of Employment to Eduardo Bernal Acebedo dated August 2, 2021 *	8-K	000-26966	10.1	September 8, 2021
10.35	Form of Long-Term Incentive Plan	8-K	000-26966	10.1	February 4, 2021
10.36	Transition and Separation Agreement of Mr. Dana Huth, dated July 7, 2021 *	10-Q	000-26966	10.1	November 9, 2021
10.37	Advanced Energy Industries, Inc. Deferred Compensation Plan *	10-Q	000-26966	10.4	November 9, 2021
21.1	Subsidiaries of Advanced Energy Industries, Inc.				Filed herewith
23.1	Consent of Independent Registered Public Accounting Firm				Filed herewith
31.1	Certification of the Chief Executive Officer Pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				Filed herewith
31.2	Certification of the Principal Financial Officer Pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				Filed herewith

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
32.1	Certification of the Chief Executive Officer Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002				Filed herewith
32.2	Certification of the Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002				Filed herewith
101.INS	Inline XBRL Instance Document				Filed herewith
101.SCH	Inline XBRL Taxonomy Extension Schema Document				Filed herewith
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document				Filed herewith
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document				Filed herewith
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document				Filed herewith
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document				Filed herewith
104	Cover Page Interactive Data File (formatted as Inline XBRL with applicable taxonomy extension information contained in Exhibits 101)				Filed herewith

* Compensation Plan

** Schedules have been omitted pursuant to Item 601(b)(2) of Regulation S-K.

+ Confidential treatment has been granted for portions of this agreement.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.

ADVANCED ENERGY INDUSTRIES, INC.
(Registrant)

/s/ Stephen D. Kelley
Stephen D. Kelley
Chief Executive Officer

Date: March 16, 2022

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

<u>Signatures</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Stephen D. Kelley</u> Stephen D. Kelley	Chief Executive Officer and Director (Principal Executive Officer)	March 16, 2022
<u>/s/ Paul Oldham</u> Paul Oldham	Chief Financial Officer and Executive Vice President (Principal Financial and Accounting Officer)	March 16, 2022
<u>/s/ Grant H. Beard</u> Grant H. Beard	Chairman of the Board	March 16, 2022
<u>/s/ Frederick A. Ball</u> Frederick A. Ball	Director	March 16, 2022
<u>/s/ Anne DelSanto</u> Anne DelSanto	Director	March 16, 2022
<u>/s/ Tina M. Donikowski</u> Tina M. Donikowski	Director	March 16, 2022
<u>/s/ Ronald C. Foster</u> Ronald C. Foster	Director	March 16, 2022
<u>/s/ Edward C. Grady</u> Edward C. Grady	Director	March 16, 2022
<u>/s/ Lanesha Minnix</u> Lanesha Minnix	Director	March 16, 2022
<u>/s/ David W. Reed</u> David W. Reed	Director	March 16, 2022
<u>/s/ John A. Roush</u> John A. Roush	Director	March 16, 2022
<u>/s/ Thomas M. Rohrs</u> Thomas M. Rohrs	Director	March 16, 2022

ADVANCED ENERGY INDUSTRIES, INC.
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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.

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 sales, including backlog orders;
- our ability to be successful in the design win process with our customers;
- 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 materials;
- sufficiency and availability of capital resources;
- capital expenditures;
- our production and factory strategy;
- 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;
- our estimates of the fair value of assets acquired;
- restructuring activities and expenses;
- the impact of changes in interest rates or inflation
- unanticipated costs in fulfilling our warranty obligations for solar inverters;
- 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.

Market and Industry Data

The market and industry data used in this Annual Report on Form 10-K are based on independent industry publications, customers, trade or business organizations, reports by market research firms and other published statistical information from third parties, as well as information based on management's good faith estimates, which we derive from our review of internal information and independent sources. Although we believe these sources to be reliable, we have not independently verified the accuracy or completeness of the information.

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, refine, and modify the raw electrical power coming from either the utility or the building facility and convert it into various types of highly controllable, usable power that is predictable, repeatable, and customizable to meet the necessary requirements for powering a wide range of complex equipment. Our power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition, high and low voltage applications such as semiconductor process control, data center computing, networking, telecommunication, medical equipment, life science applications, industrial technology and production, scientific instruments, clean technology production, advanced material production and temperature-critical thermal. We also supply related sensing, controls, and instrumentation products for advanced measurement and calibration of radio frequency ("RF") power and temperature, and electrostatic instrumentation products for test and measurement applications. Our network of global service support centers provides a recurring revenue opportunity as we offer repair services, conversions, upgrades, refurbishments, and used equipment to companies using our products.

Our products are sold into the Semiconductor Equipment, Industrial and Medical, Data Center Computing, and Telecom and Networking markets, and we provide revenue data by market vertical to enable tracking of trends. Advanced Energy is organized on a global, functional basis and operates in a single segment structure for power electronics conversion products.

At the beginning of 2020 we saw the spread of COVID-19, which grew into a global pandemic. Our focus on providing a healthy and safe working environment for our employees led to intermittent shutdowns of our manufacturing facilities to implement new health and safety protocols and additional investments to comply with government guidelines. During 2020 and 2021 there were periods when some of our manufacturing facilities were not operating or were operating at reduced capacity due to government mandates to restrict travel, maintain social distancing, and implement health and safety procedures. Additionally, during 2021, ongoing restrictions related to COVID-19 and disruptions in an already challenged global supply chain limited the availability of certain materials, parts, subcomponents, and subassemblies needed for production, impacting our ability to ship product to meet customer demand and contributing to increased backlog. The shortage of critical components was caused in part by the pandemic-driven rise in consumer demand for technology goods, increased demand for electronic components used in a wide variety of industries, logistics-related disruptions in shipping, capacity limitations at some suppliers due to COVID-19, its variants, labor shortages, and other factors. We expect the challenges associated with this environment to continue into 2022.

Although COVID-19 impacted our revenues and manufacturing efficiency over the last two years, COVID-19 has not materially impacted our liquidity, our ability to access capital, our ability to comply with our debt covenants or the fair value of our assets. Additionally, we believe the accommodations we have made to our work environment, including employees utilizing work-from-home arrangements where necessary, will not impact our ability to maintain effective internal controls over financial reporting.

Looking forward, we expect that customer demand in 2022 will remain strong across our served markets; however, our ability to procure critical components to meet our customers' needs will continue to be limited by the ongoing constraints in the global supply chain. These supply constraints have led to longer lead times in procuring materials and subcomponents and, in some cases, higher costs and inventory level requirements. We have implemented measures to improve supply of critical materials and components and to mitigate the impact of higher input costs and believe that our higher levels of inventory are well matched to meet our shippable customer demand. However, it is not clear how long this supply chain condition will continue, how quickly it may recover, or the extent to which our mitigating actions will be able to improve supply or to compensate for our higher costs. As such, our forward-looking projections of revenues, earnings, and cash flow may be adversely impacted if the situation continues or further deteriorates. Please see the information under the caption "Risk Factors" in Item 1A of this Annual Report on Form 10-K for additional discussion on the potential impacts of the ongoing constraints in the global supply chain and COVID-19 to the future operations of our business.

We incorporated in Colorado in 1981 and reincorporated in Delaware in 1995. Our executive offices are located at 1595 Wynkoop Street, Suite 800, Denver, Colorado 80202, and our telephone number is (970) 407-6555.

Recent Acquisitions

On June 1, 2021, we acquired 100% of the issued and outstanding shares of capital stock of TEGAM, Inc., which is based in Geneva, Ohio. This acquisition added metrology and calibration instrumentation to Advanced Energy's RF process power solutions in our Semiconductor and Industrial and Medical markets.

On December 31, 2020, we acquired 100% of the issued and outstanding shares of capital stock of Versatile Power, Inc., which is based in Campbell, California. This acquisition added RF and programmable power supplies for medical and industrial applications to our product portfolio and further expands our presence in the medical market by adding proven technologies, deep customer relationships, expertise in medical design, and a medical-certified manufacturing center.

In September 2019, we completed the acquisition of Artesyn Embedded Technologies, Inc.'s embedded power business ("Artesyn"), which was one of the world's largest providers of highly engineered, application-specific AC-DC and DC-DC power supplies for demanding applications. This acquisition diversified our product portfolio and gave us access to attractive growth markets, including data centers (including hyperscale), telecom infrastructure in next generation 5G networks, embedded industrial power applications and medical diagnostic and treatment applications.

For additional information, see *Note 2. Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data."

Products and Services

PRODUCTS

Our precision power products and solutions are designed to enable new process technologies, improve productivity, lower the cost of ownership, and provide critical power capabilities for our customers. These products are designed to meet our customers' demanding requirements in efficiency, flexibility, performance, and reliability. We also provide repair and maintenance services for our products.

We principally serve global original equipment manufacturers ("OEM") and end customers in a wide range of semiconductor and industrial technology applications with a broad range of advanced and embedded power products. Our advanced power products include plasma power solutions, high voltage power systems, power control modules, temperature and other sensing solutions that are designed to deliver precise power, control and measurement of processes used in a diverse set of applications in semiconductor device manufacturing, thin film deposition of advanced materials, thermal power control, and instrumentation. Our embedded power products include a wide range of high and low voltage, AC-DC, DC-DC, and board mounted power ("BMP") solutions designed to provide stable and efficient power in mission critical applications across a variety of industrial technology applications such as telecommunication and networking equipment, data center servers and storage systems, medical equipment, robotics, motion control and test and measurement equipment.

Our plasma power solutions include RF power supplies, RF matching networks, RF instrumentation, direct current ("DC") power systems, pulsed DC power systems, low frequency alternating current ("AC") power systems, and remote plasma sources for reactive gas applications. These solutions are used in a wide range of thin film processes across multiple semiconductor applications, including plasma-based dry etch, dry strip, atomic layer etch, atomic layer deposition, chemical vapor deposition, physical vapor deposition, electro-chemical deposition, and ion implementation. In addition, these solutions are used in the processing of advanced materials in adjacent industries such as flat panel display, solar cell manufacturing, architectural glass coating, thin film coating, optical coating, and hard coatings.

Our power control modules and thermal instrumentation products are used in the semiconductor and adjacent industries, in which time-temperature cycles affect material properties, productivity, and yield. These products are used in processes such as rapid thermal processing, chemical vapor deposition, epitaxy, and crystal growing, which require non-contact temperature measurement. They are also used in many industrial production applications for chemical processing, the manufacturing of metal, carbon fiber, and glass, as well as numerous other industrial power applications.

Our RF power, micro-ohm, and temperature metrology instruments and calibration systems are used to make critical measurements and calibrate customer hardware with speed and high accuracy in a wide range of applications, such as semiconductor manufacturing, medical, aerospace, and food processing industries.

Our embedded power products are designed to maximize energy conversion efficiency, minimize physical sizes, and to meet a variety of standards, such as IEC 60601-1 for medical equipment or IEC 60950-1 for information technology equipment. Our lower power RF power supplies are designed into medical and surgical equipment for a range of therapeutic applications. Our low-voltage AC-DC and DC-DC power supplies are used in a wide variety of end markets such as data center computing, telecom, networking, medical equipment, and broad industrial electronics. These products feature industry leading efficiency and density, to maximize performance, lower energy costs, and minimize the form factor. These products target applications where energy usage is high, such as data centers, but also applications that require a highly reliable and rugged design for use in demanding climate conditions, such as a wireless cellular tower.

Our high and lower voltage DC-DC products are designed to meet the demanding requirements of OEMs worldwide. Our DC-DC solutions and custom-built power conversion products offer high and low 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 high voltage power systems and high voltage DC-DC products target applications including semiconductor wafer processing and metrology, electrostatic clamping of substrates, scientific instrumentation, mass spectrometry, and x-ray systems for industrial and analytical applications. The low voltage DC-DC board mounted solutions are designed for a wide range of industrial applications such as healthcare, telecommunications, test and measurement, instrumentation, industrial equipment and distributed power in server and storage systems. Our programmable DC power supplies provide accurate power delivery and measurement for use in a wide range of test and measurement as well as scientific research applications.

PowerInsight, our big data analytics solution, transforms the data acquired from our power delivery systems into useable insights, through a combination of enhanced data sets and advanced analytics. These capabilities allow our customers to maximize performance, reduce costs and improve yield in their manufacturing processes.

GLOBAL SUPPORT

Our global support services group offers in-warranty and out-of-warranty repair services in the regions in which we operate, providing us with revenue opportunities from repair, upgrades and retrofit offerings to our installed base. Our customers wish to lower the cost of ownership of their capital equipment and are increasingly sensitive to the significant costs of system downtime. They expect suppliers to offer comprehensive local repair service and customer support. In addition to product repairs our customers look for upgrade and retrofit offerings to extend the useable life of their capital equipment for additional technology generations. To meet these market requirements, we maintain a worldwide support organization in ten countries, including the United States ("U.S."), the People's Republic of China ("PRC"), Japan, Korea, Taiwan, Germany, Ireland, Singapore, Israel, and Great Britain. Support services include warranty and non-warranty repair services, upgrades, and refurbishments on the products we sell.

As of December 31, 2015, we discontinued the production, engineering, and sales of our solar inverter product line, which represented 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. 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. In May 2019, we divested the U.S. central inverter repair and support business to Bold Renewables. See *Note 4. Disposed and Discontinued Operations* in Part II, Item 8 "Financial Statements and Supplementary Data."

Markets

Our products compete in markets for high tech applications using capital equipment. The majority of our markets are not generally subject to significant seasonality; however, these markets are cyclical due to 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. 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. For more information related to the markets in which we compete and the current environment in those markets, see *Business Environment and Trends* in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

SEMICONDUCTOR EQUIPMENT MARKET

Growth in the Semiconductor Equipment market is driven by increasing integrated circuit content across many industries, higher demand for processing and storage in advanced applications such as artificial intelligence, cloud computing, and autonomous vehicles, and the rapid adoption of advanced mobile connectivity solutions, such as 5G, which enhances existing and enables new wireless applications. To address the long-term growing demand for semiconductor devices, the industry continues to invest in production capacities for both leading-edge and trailing-edge nodes, logic devices, the latest memory devices including 3D-NAND, DRAM, and new emerging memories such as MRAM, and back-end test and advanced wafer-level packaging. The industry's transition to advanced technology nodes in logic and DRAM and to increased layers in 3D-NAND memory devices require an increased number of plasma-based etch and deposition process tools and higher content of our advanced power solutions per tool. As etching and deposition processes become more challenging due to increasing aspect ratios in advanced 3D devices, more advanced RF, and DC technologies are needed. We are meeting these challenges by providing a broader range of more complex RF and DC power solutions. Beyond etch and deposition processes, the growing complexity at the advanced nodes also drive a higher number of other processes across the wafer fab, including inspection, metrology, thermal, ion implantation, and semiconductor test, where Advanced Energy actively participates as a critical technology provider. In addition, our global support services group offers comprehensive local repair service, upgrade, and retrofit offerings to extend the useable life of our customers' capital equipment for additional technology generations. The acquisition of Artesyn in September 2019 expanded our reach within the Semiconductor Equipment market by adding a broad range of low voltage applications as well as back-end test and assembly equipment customers.

INDUSTRIAL AND MEDICAL MARKET

Customers in the Industrial and Medical market incorporate our advanced power, embedded power, and measurement products into a wide variety of equipment used in applications such as advanced material processing, industrial production, medical devices, life science equipment, scientific analytical instrumentation, clean technology production, and a variety of industrial technology applications such as robotics, horticulture, motor drives, and connected light-emitting diodes. The acquisition of Artesyn in September 2019 substantially expanded Advanced Energy's portfolio of products and opportunities in the Industrial and Medical market.

OEM customers design equipment utilizing our advanced material process power technologies in a variety of industrial production applications including glass coating, glass manufacturing, flat panel displays, photovoltaics solar cell manufacturing, and similar thin film manufacturing, including data storage and decorative, hard and optical coatings. These applications employ similar technologies to those used in the Semiconductor Equipment market to deposit films on non-semiconductor substrates. Our strategy around these applications is to leverage our thin film deposition technologies into an expanded set of new materials and applications in adjacent markets.

Advanced Energy also serves the Industrial and Medical market with mission-critical power components that deliver high reliability, precise, low noise or differentiated power to the equipment they serve. Examples of products sold into the Industrial and Medical market includes high voltage products for analytical instrumentation, medical equipment, low voltage power supplies used in applications for medical devices, test and measurement, medical lasers, scientific instrumentation and industrial equipment, and power control modules and thermal instrumentation products for material fabrication, processing, and treatment. Our gas monitoring products serve multiple applications in the energy market, air quality monitoring, and automobile emission monitoring and testing. Our strategy in the Industrial and Medical market is to grow and expand our addressable market both organically through our global distribution channels and through acquisitions of products and technologies that are complimentary and adjacent to our core power conversion applications.

DATA CENTER COMPUTING MARKET

Following the acquisition of Artesyn in September 2019, Advanced Energy entered the Data Center Computing market with industry leading power conversion products and technologies, which we sell to original equipment manufacturers ("OEMs") and original design manufacturers ("ODMs") of data center server and storage systems, as well as cloud service providers and their partners. Driven by the growing adoption of cloud computing, market demand for server and storage equipment has shifted from enterprise on-premises computing to the data center, driving investments in data center infrastructure.

The data center industry has started to transition to 48 Volt infrastructure, where 48 Volt DC power replaces 12 Volt in server racks in order to improve overall power efficiency. Advanced Energy benefits from these trends by leading the industry in providing 48 V server power solutions to the data center industry. Further, demand for edge computing is growing, driven by the need for faster processing, lower latency, higher data security, and more reliability than traditional cloud computing. With its wide range of many unique configurations and requirements, edge computing creates additional opportunities for Advanced Energy. Lastly, the rapid growth and adoption of Artificial Intelligence and machine learning is driving accelerated demand for server and storage racks with increased power density and higher efficiency, which plays well to Advanced Energy's strengths. With a growing presence at both cloud service providers and industry leading data center server and storage vendors, we believe Advanced Energy is well positioned to continue to capitalize on the ongoing shift towards cloud computing.

TELECOM AND NETWORKING MARKET

The acquisition of Artesyn in September 2019 provided Advanced Energy with a portfolio of products and technologies that are used across the Telecom and Networking market. Our customers include many leading vendors of wireless infrastructure equipment, telecommunication equipment and computer networking. The wireless telecom market continues to evolve with more advanced mobile standards. 5G wireless technology promises to drive substantial growth opportunities for the telecom industry as it enables new advanced applications such as autonomous vehicles and

virtual/augmented reality. Telecom service providers have started to invest in 5G, and this trend is expected to drive demand of our products into the Telecom and Networking market. In datacom, demand is driven by networking investments by telecom service providers and enterprises upgrading their network, as well as cloud service providers and data centers investing in their networks for increased bandwidth.

Customers

Our products are sold worldwide to OEMs, integrators, distributors and directly to end users. The following table summarizes the percentage of our total sales derived from our ten largest customers:

	Years Ended December 31,		
	2021	2020	2019
Ten largest customers	58.3 %	58.0 %	57.3 %

The following table summarizes sales to and percentage of total sales to our two largest customers (in thousands):

	Years Ended December 31,					
	2021		2020		2019	
Applied Materials, Inc.	\$ 296,369	20.4 %	\$ 248,350	17.5 %	\$ 164,724	20.9 %
Lam Research Corporation	147,385	10.1 %	141,778	10.0 %	88,251	11.2 %

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. The loss of a large customer could have a material adverse effect on our results of operations.

Backlog

The following table summarizes our backlog:

	December 31,	December 31,	Change	
	2021	2020	Dollar	Percent
Backlog	\$ 927,810	\$ 290,681	\$ 637,129	219.2 %

Backlog orders are firm orders scheduled to be filled and shipped in the next 12 months. Backlog increased year over year based on strong demand across our portfolio, particularly in our Semiconductor and Industrial & Medical markets, combined with supply chain shortages for critical components which limited our revenues. Backlog orders are not necessarily an indicator of future sales levels because of variations in lead times and the significance of customer production demand pull systems to our business, which are not reflected in orders or backlog.

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."

Marketing, Sales and Distribution

We sell our products through direct and indirect sales channels. Our sales operations are primarily located in the U.S., the PRC, the United Kingdom, Germany, Israel, Japan, South Korea, India, Singapore, Philippines, Hong Kong, Ireland, and Taiwan. In addition to a direct sales force, we have independent sales representatives, channel partners 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 sales by geographic region. Sales are attributed to individual countries based on customer location (in thousands).

	Years Ended December 31,					
	2021		2020		2019	
United States	\$ 561,312	38.5 %	\$ 530,965	37.5 %	\$ 321,869	40.8 %
North America (excluding U.S.)	104,167	7.2	156,856	11.1	51,765	6.6
Asia	597,830	41.1	606,893	42.9	295,155	37.4
Europe	179,056	12.3	117,989	8.3	119,427	15.1
Other	13,589	0.9	3,123	0.2	732	0.1
Total	<u>\$ 1,455,954</u>	<u>100.0 %</u>	<u>\$ 1,415,826</u>	<u>100.0 %</u>	<u>\$ 788,948</u>	<u>100.0 %</u>

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

Manufacturing

The manufacturing of our products is primarily performed at our major sites in the PRC, Philippines, and Malaysia. In addition, we perform limited specialty manufacturing for some of our products in the U.S., United Kingdom, Germany, and Denmark. See Item 1A, "Risk Factors" for a discussion of certain risks related to our manufacturing operations.

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. During 2020 and 2021, COVID-19 impacted the availability of materials, parts, and subcomponents needed for production. In some cases, we paid premiums or expedite fees to obtain critical parts to meet urgent customer needs. In many instances, we passed these additional costs along to our customers. We expect the related supply chain challenges will continue into 2022. However, we seek to reduce costs, lower the risks of production and service interruptions, and mitigate key parts shortages 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 customers' processes. The qualification process for our process power products, particularly as it pertains to semiconductor customers, follows semiconductor industry standard practices, such as "copy exact";
- monitoring the financial condition and overall performance 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 where possible 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 325 U.S. issued patents and 419 foreign issued patents, and we have 429 patent applications pending in the U.S., Europe, and Asia. Most patents are active for 20 years, and our patents expire on various dates through 2040. A substantial majority of our patents are related to our process power products and solutions 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. We leverage our proprietary technology and trade secrets to deliver on our strategy of selling differentiated products for our most important customer solutions.

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. We face a wide variety of competitors, and 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 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. Competitors in each of our market verticals include, but are not limited to, the following:

<u>Semiconductor Equipment</u>	<u>Industrial and Medical</u>	<u>Data Center Computing</u>	<u>Telecom and Networking</u>
COMET Holding AG.	Cosel Co., Ltd.	Acbel Polytech Inc.	ABB Ltd.
Daihen Corp.	Delta Electronics, Inc.	Delta Electronics, Inc.	Delta Electronics, Inc.
Kyosan Electric Mfg. Co., Ltd.	MEAN WELL Enterprises	Flex Ltd.	Lite-On Technology Corp.
MKS Instruments, Inc.	TDK-Lambda Americas Inc.	Lite-On Technology Corp.	Murata Manufacturing
TRUMPF Hüttinger GmbH + Co. KG	TRUMPF Hüttinger GmbH + Co. KG	Vicor Corporation	Vapel
	XP Power Ltd.		

In addition, 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 compete successfully in these markets depends on our ability to make timely introduction of new products and enhancements to existing products, to localize these development and production activities in key world regions close to our customers, and to produce high 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

We perform research and development ("R&D") of products to develop new or emerging applications, technological advances 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 and related software 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.

The following table summarizes research and development expenses and the percentage of these expenses as compared to total sales (in thousands):

	Years Ended December 31,		
	2021	2020	2019
Research and Development Expenses	\$ 161,831	\$ 143,961	\$ 101,503
% of Sales	11.1%	10.2%	12.9%

Employees

As of December 31, 2021, we had approximately 10,000 employees. Our employees are not represented by unions, except for statutory organization rights applicable to our employees in the PRC and in Germany. We believe that our continued success depends, in part, on our ability to attract and retain qualified personnel. We recognize that our employees are critical to our ongoing success and endeavor to maintain positive relationships with our employees at all levels. We have a global diverse workforce with employees located in more than 24 countries across the globe and representative of many different cultural, racial, ethnic, and religious backgrounds. See Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" for a discussion of our human capital resources. Advanced Energy encourages diversity and recognizes that each person's background, experiences, and unique skill set are fundamental contributors to our success. As part of our efforts to promote diversity and develop emerging talent in STEM (science, technology, engineering, and mathematics), we launched the Advanced Energy STEM Diversity Scholarship Program in 2020 to provide college students with tuition assistance, mentoring, and internship opportunities.

Environmental Matters

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.

Advanced Energy is dedicated to reducing the impact of manufacturing and procurement activities on the environment by reducing waste in our operations and improving the energy efficiency of our global factories. Our factories in PRC and the Philippines monitor greenhouse gas emissions and report to the CDP, an international non-profit organization that helps companies disclose their environmental impact. We also strive to reduce our customers' emissions as we develop and deliver increasingly efficient power-delivery products in our customers' applications. We adhere to responsible minerals sourcing and commit to the social, environmental, and ethical standards set out in the Responsible Business Alliance Code of Conduct.

Available Information

Our website address is www.advancedenergy.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.

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 material 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.

COVID-19, natural disasters, and related risks

COVID-19 could further materially adversely affect our business, workforce, supply chain, results of operations, financial condition and/or cash flows.

The ongoing COVID-19 pandemic has adversely impacted our ability (a) to manufacture, test, service and ship our products, (b) to get required materials and sub-assemblies to build and service our products and (c) to staff labor and management for manufacturing, research and development, supply chain, service, and administrative operations. Further, we may continue to experience adverse impact with our global supply chain partners, critical subassembly suppliers, parts distributors, and transportation service providers, which may result in increased costs, material shortages, and the inability to fully meet our customers' demand. For example, in 2021, the combination of increased demand for semiconductor and other select components and the ongoing impact of COVID-19 has affected global electronics markets and impacted our ability to ship to our full demand levels. In addition, we have experienced higher input costs as we have incurred material premiums, expedite fees, price increases, and higher logistic costs. We expect these conditions will continue to adversely impact our ability to ship products to customers. Beyond 2021, it is not known how long or significant these global supply strain constraints will be, but it may continue to impact our results. Further foreign and domestic government actions restricting travel, commerce, and gathering could adversely affect our manufacturing locations. COVID-19 has also resulted in economic recessions and high unemployment in many countries, which could negatively impact future customer purchases of our products. In addition, a portion of our workforce continues to work remotely. While we have been successful in transitioning to this remote environment, the long-term impact on productivity and innovation is not yet clear. As a result, COVID-19 and its variants could continue to adversely impact our near-term and long-term revenues, earnings and cash flow and could require further expenditures. The COVID-19 situation continues to evolve and to the extent that it adversely affects our business, financial condition, operating results, and cash flows, it may also have the effect of heightening many of the other risks described in this "Risk Factors" section. Other impacts may arise that we are not aware of currently. We have an active rapid response team to mitigate risks we are aware of currently and as they arise.

Our orders of raw materials, parts, components, and subassemblies are based on demand forecasts and may be constrained by supply shortages caused by COVID-19 or other factors.

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.

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. Orders with our suppliers cannot always be amended in response. In addition, 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 number 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, 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 exceeds our customers' and our forecasts, we may not be able to timely obtain enough raw materials, parts, components, or subassemblies, on favorable terms or at all, to fulfill the excess demand. This may lead to customers cancelling orders prior to shipment causing a decrease in sales, which may have a material adverse effect on our business and results of operations. In addition, given the proprietary nature of our products, many of these parts are sole sourced or not easily interchangeable. For example, in 2021 there was a global shortage of certain electronics and semiconductor parts given the emerging higher global demand for technology goods and the impact of COVID-19 and other disruptions on the global supply chain. This has resulted in higher levels of inventory while we procure critical parts to complete full kits. If we are not able to obtain parts in a reasonable timeframe and at a reasonable cost our business may be adversely impacted. Further, if demand for our products does not continue at current levels, we might not be able to use all 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.

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.

Industry related risks

Our operations in the People's Republic of China and the Asia Pacific region 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 People's Republic of China ("PRC"), which exposes us to risks, such as exchange controls and currency restrictions, changes in local economic conditions, changes in customs regulations and tariffs, 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. At various times during recent years, the U.S. and PRC have had significant disagreements over geopolitical, trade and economic issues. Controversies may arise in the future between these two countries. Any escalating political controversies between the U.S. and PRC, whether or not directly related to our business, could 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.

Additionally, there is inherent risk, based on the complex relationships among PRC, Hong Kong, Taiwan, and the United States, that political, diplomatic, and national security influences might lead to trade, technology, or capital disputes, and/or disruptions, in particular those affecting the semiconductor industry. This would adversely affect our business with PRC, Hong Kong, and/or Taiwan and perhaps the entire Asia Pacific region or global economy.

Actions by the Chinese government extending its territorial claims, such as the passage of the national security law in Hong Kong and the potential establishment of an Air Defense Identification Zone over the South China Sea,

raises the fear of conflict that could result in international reprisal. Actions by the U.S. government on trade policy against the PRC and companies like Huawei Technologies Co., Ltd. have also escalated tensions. Lastly, the recent U.S. and PRC consulate closures and the continuing Hong Kong political unrest is creating more uncertainty. Should the PRC take any actions against Taiwan, we could see additional risks to diplomatic and trade relations that could inhibit our access to materials, parts, and customers and impair our ability to effectively operate in the region. Given our expanded presence in the PRC and Hong Kong, our business results, operations, and financial condition could be adversely affected by these developments and other changes to political, diplomatic, and social conditions. Moreover, PRC's policies towards, and treatment of, U.S. companies operating in PRC and Hong Kong could change quickly resulting in an adverse impact to us.

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

As a supplier to the global semiconductor equipment, telecom, networking, data center computing, industrial, and medical industries, we are subject to business cycles, the timing, length, and volatility of which can be difficult to predict. Certain of 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. 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 enough manufacturing capacity and inventory to fulfill customer orders, effectively manage our supply chain, and attract, retain, and motivate enough 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. For example, following record levels of demand in the first half of 2018, the Semiconductor Equipment market experienced a decline, and, as a result, Advanced Energy's revenue from the Semiconductor Equipment market declined 24.5% during 2019, as compared to 2018. Although the Semiconductor Equipment market improved during the fourth quarter of 2019 and throughout 2021, it is unclear how long this recovery will last. In addition, our Data Center Computing and Telecom and Networking markets are characterized by large program investments, which can cause variations in quarterly or annual revenues. For example, during 2020 our growth in Data Center Computing and Telecom and Networking was driven by share gains at specific customer accounts. Towards the end of 2020, we began to experience a period of digestion by our major customers that continued into early 2021, resulting in lower demand. We expect overall demand levels may continue to fluctuate each quarter through these business cycles. In 2021, demand was strong across our markets, however industry wide supply constraints for certain integrated circuit and other parts limited our ability to ship to our demand levels and resulted in increased cost as we procured material through open market and other purchases. It is unclear how long it will take before the supply chain environment improves, further impacting our financial results.

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 customer 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. Increasingly, we are required to accelerate our investment in research and development to meet time-to-market, performance and technology adoption cycle needs of our customers simply to compete for design wins. Given such up-front investments we make to develop, evaluate, and qualify products in the design win process, our success and future growth depend 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. If existing or new customers do not choose us during the design win process, our market share will be reduced, the potential revenues related to the lifespan of our customers' products, which can be five to ten years, will not be realized, and our business, financial condition and results of operations would be materially and adversely impacted.

Business model and capital structure related risks

Despite the continued evolution of our manufacturing footprint our product lines are manufactured at only a few sites and our sites are not generally interchangeable.

Our power products for the semiconductor industry are manufactured in Shenzhen, PRC and Penang, Malaysia. Our high voltage products are manufactured in Ronkonkoma and Lockport, New York, Littlehampton, United Kingdom and Shenzhen, PRC. Our thermal instrumentation products are manufactured in Vancouver, Washington, Littlehampton, United Kingdom and Frankfurt, Germany. Our pyrometry solutions are manufactured in Ballerup, Denmark, Frankfurt, Germany, Magdeburg, Germany and Vancouver, Washington. Our telecom, networking, data center computing, and medical products are manufactured in Zhongshan, PRC, Rosario, Philippines and Santa Rosa, Philippines. Most facilities are under operating leases 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 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 or disrupt our productivity at such site and could prevent us from meeting our customers' requirements in a timely manner, or at all.

Additionally, we have a plan to complete the relocation of our Shenzhen, PRC manufacturing facility in 2022. As a result, we have invested in a dual manufacturing facility in Penang, Malaysia capable of manufacturing our semiconductor and other products. We believe this investment will help to mitigate our exposure to regional risks, improve our business continuity profile and lower costs over time. We opened this facility in 2020; however, it may take additional time to realize the facility's full production capacity given the impact of COVID-19 and supply chain constraints. As this facility increases its volume capabilities, we may experience production inefficiencies, challenges related to material flow and workmanship, or other issues customary to ramping a new factory. If we are not able to fully and timely integrate our facility, our revenues may be negatively impacted until we are able to increase capacity or productivity.

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

We transitioned the purchasing of a substantial portion of components for our 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.

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. Our customers continually exert pressure on us to reduce our prices and extend payment terms and we may be required to enter into long term reduced pricing agreements, extended payment terms, exclusivity arrangements, or other unfavorable contract terms with our largest customers to remain competitive. In addition, we compete in markets in which customers may include dual or multi-sourcing of power. We believe some of our Asian competitors benefit from local governmental funding incentives and purchasing preferences from end-user customers in their respective countries. 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, product offerings and product costs accordingly, and if we are unable to do so, our business, financial condition, and results of operations could be materially and adversely affected. Further, in 2021 we increased prices and implemented surcharges across many of our products to reflect our higher supply chain costs. Although these price changes have been accepted by our customers, the higher prices could make our products less competitive in the market over time and could have an adverse effect on our results of operations.

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

The following table summarizes the percentage of total sales derived from our ten largest customers:

	Years Ended December 31,		
	2021	2020	2019
Ten largest customers	58.3 %	58.0 %	57.3 %

The following table summarizes sales to and percentage of total sales from our two largest customers (in thousands):

	Years Ended December 31,					
	2021		2020		2019	
Applied Materials, Inc.	\$ 296,369	20.4 %	\$ 248,350	17.5 %	\$ 164,724	20.9 %
Lam Research Corporation	147,385	10.1 %	141,778	10.0 %	88,251	11.2 %

The following table summarizes the accounts receivable balances (in thousands) and percentages of the total accounts receivable from customers who individually accounted for 10% or more of accounts receivable:

	December 31,		December 31,	
	2021		2020	
Applied Materials, Inc.	\$ 42,425	17.9 %	\$ 33,402	14.2 %
Nidec Motor Corporation	*	* %	\$ 24,344	10.4 %

* Customer's balance was less than 10% of total

A significant decline in sales from these or other large customers, or our inability to collect on these sales, could materially and adversely impact our business, results of operations and financial condition.

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

Our success depends to a significant degree upon the continuing contributions of our management, technical, marketing, and sales employees. We may not be successful in retaining our employees or attracting or retaining additional skilled personnel as required. Failure to retain or attract personnel could significantly harm our results of operations and competitive position. Our success in hiring and retaining employees depends on a variety of factors, including the attractiveness of our compensation and benefit programs, global economic or political and industry conditions, our organizational structure, our reputation, culture and working environment, competition for talent and the availability of qualified employees, the availability of career development opportunities, and our ability to offer a

challenging and rewarding work environment. We must develop our personnel to provide succession plans capable of maintaining continuity during 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.

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.

Acquisition related risks

Our long-term success and results of operations depend on our ability to successfully integrate Artesyn's business and operations and realize the anticipated benefits from the acquisition.

In September 2019, we acquired Artesyn, and we are continuing to combine Artesyn's business with our business. The acquisition of Artesyn has significantly increased our embedded power product offerings, increased our exposure to the Industrial and Medical, Data Center Computing, and Telecom and Networking markets, and significantly increased the number of employees and facilities.

To realize the anticipated benefits of the acquisition, we must continue to combine our businesses in an efficient and effective manner and realize our synergy and cost-savings targets. Integrating Artesyn's business and operations with ours requires significant management attention, effort, and expenditures, and we may not be able to achieve the longer-term integration goals in an effective, complete, timely or cost-efficient manner.

Potential risks related to the successful integration of Artesyn's business include our ability to:

- maintain and improve Artesyn's financial and operating results while integrating and optimizing our combined sales, marketing, manufacturing, and corporate administrative organizations;
- optimize our combined worldwide manufacturing footprint while utilizing Artesyn's vertically integrated manufacturing model for a broader set of Company products;
- successfully eliminate fixed costs previously absorbed by other businesses prior to the transaction;
- recognize and capitalize on anticipated product sales and technology enhancement opportunities presented by our combined businesses;
- integrate our information technology systems to mitigate cyber-security risks and enable the management and operation of the combined business.

If we are unable to successfully or timely integrate the operations of Artesyn's business into our business over the long-term, we may be unable to realize the long-term revenue growth, synergies, cost-savings, and other anticipated benefits resulting from the acquisition and our business could be adversely affected. Additionally, we have and may

continue to incur transaction-related costs, including legal, regulatory, and other costs associated with implementing integration plans, including facilities and systems consolidation costs and employment-related costs. Artesyn's business and operations may not achieve the anticipated revenues and operating results. Any of the foregoing risks could materially harm our business, financial condition, and results of operations.

Our debt obligations and the restrictive covenants in the agreements governing our debt could limit our ability to operate our business or pursue our business strategies, could adversely affect our business, financial condition, results of operations, and cash flows, and could significantly reduce stockholder benefits from a change of control event.

Our debt obligations could make us more vulnerable to general adverse economic and industry conditions and could limit our flexibility in planning for, or reacting to, changes in our business and the industries in which we operate, thereby placing us at a disadvantage to our competitors that have less indebtedness.

Our debt obligations impose financial covenants on us and our subsidiaries that require us to maintain a certain leverage ratio. The financial covenants place certain restrictions on our business that may affect our ability to execute our business strategy successfully or take other actions that we believe would be in the best interests of our Company. These include limitations or restrictions, among other things, on our ability and the ability of our subsidiaries to:

- incur additional indebtedness;
- pay dividends or make distributions on our capital stock or certain other restricted payments or investments;
- make domestic and foreign investments and extend credit;
- engage in transactions with affiliates;
- transfer and sell assets;
- effect a consolidation or merger or sell, transfer, lease, or otherwise dispose of all or substantially all our assets; and
- create liens on our assets to secure debt.

Our debt obligations contain certain customary events of default. Any breach of the covenants or other event of default could cause a default on our debt obligations, which could restrict our ability to borrow under our revolving credit facility. If there were an event of default under certain provisions of our debt arrangements that was not cured or waived, the holders of the defaulted debt may be able to cause all amounts outstanding with respect to the debt instrument, plus any required settlement costs, to be due and payable immediately. Our assets and cash flow may not be sufficient to fully repay borrowings under our outstanding debt instruments if accelerated upon an event of default. If we are unable to repay, refinance, or restructure our indebtedness as required, or amend the covenants contained in these agreements, the lenders can exercise all rights and remedies available under our Credit Agreement or applicable laws or equity.

Activities necessary to integrate acquisitions may result in costs more than 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 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.

Commercial and financial related risks

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, because 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 usernames, 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 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.

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 customers or 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 by patents in several countries in which we do business, and we have limited patent protection in other countries, including the PRC. 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 are subject to risks inherent in international operations.

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 table below summarizes our sales by geographic area (in thousands). Sales to customers outside the United States represent a significant portion of our total revenue.

	Years Ended December 31,					
	2021		2020		2019	
United States	\$ 561,312	38.5 %	\$ 530,965	37.5 %	\$ 321,869	40.8 %
North America (excluding U.S.)	104,167	7.2	156,856	11.1	51,765	6.6
Asia	597,830	41.1	606,893	42.9	295,155	37.4
Europe	179,056	12.3	117,989	8.3	119,427	15.1
Other	13,589	0.9	3,123	0.2	732	0.1
Total	<u>\$ 1,455,954</u>	<u>100.0 %</u>	<u>\$ 1,415,826</u>	<u>100.0 %</u>	<u>\$ 788,948</u>	<u>100.0 %</u>

Our acquisitions 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;
- Our ability to procure parts from suppliers affected by geographic, geopolitical, pandemic, or other factors related to their local environment.
- 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 enough 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 significant balances in accounts receivable from foreign customers; and
- changes in tariffs, income tax, value added tax, 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.

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 and has negatively impacted the global demand for our products. Some of our key markets depend largely on consumer spending. Economic uncertainty exacerbates negative trends in consumer spending and may cause our customers to push out, cancel, or refrain from placing orders.

Difficulties or increased costs 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 including inflation, interest rates, availability of capital markets, consumer spending rates, energy availability and costs and the effects of government initiatives to manage 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.

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 impact of control failures in the event of non-compliance.

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 increasing claims from customers and suppliers and increasing litigation related to the legacy inverter product line. We review such claims and vigorously defend against such lawsuits in the ordinary course of our business. We cannot assure 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 income taxes" 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 they 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 4. Disposed and Discontinued Operations* in Part II, 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 (loss) from discontinued operations, net of income taxes." See *Note 4. Disposed and Discontinued Operations* in Part II, 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 operations could be materially and adversely affected. In addition, we have large, long-term liabilities such as local lease and pension liabilities in Europe and Asia creating more significant exposure to fluctuations in the value of the Euro, Philippine Peso, and Chinese Yuan. We do not attempt to hedge these exposures given the long-term nature of the underlying liabilities and the non-cash nature of the foreign exchange gain or loss.

The PRC government is continually pressured by its trading partners to allow its currency to float in a manner like other major currencies. Any change in the value of the Chinese yuan could significantly increase the labor and other costs incurred in the operation of our Shenzhen and Zhongshan facilities and the cost of raw materials, parts,

components, and subassemblies that we source in the PRC, which could materially and adversely affect our results of operations.

The United Kingdom's exit from 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 January 23, 2020, the UK left the EU, which is commonly referred to as "Brexit," and was in a transitional period through December 31, 2020. As of January 1, 2021, EU Trade Agreements no longer applied to the UK. The UK has taken steps to reproduce the effects of trading agreements that previously applied through the provisional application of new trade agreements not yet ratified and has introduced the UK Global Tariff. These changes resulted in increased regulatory complexities on imports and exports to and from the UK which may adversely affect our sales, operations, and financial results. Our operations in the UK may also be adversely affected by significant fluctuations in the UK exchange rates and increased administrative costs and tariffs on the importation of parts for manufacturing and repair services. Moreover, the imposition of import restrictions and duties levied on our UK products may make our products more expensive for such customers and less competitive from a pricing perspective.

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. The acquisition of Artesyn added additional information systems that are initially different from current systems. 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.

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 our 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. We have experienced increased litigation related to our legacy inverter product line. 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 our pension plan.

We currently have unfunded obligations to our pension plans. 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 17. Employee Retirement Plans and Postretirement Benefits* in Part II, Item 8 "Financial Statements and Supplementary Data" contained herein.

Our intangible assets may become impaired.

The following table summarizes our goodwill and intangible assets (in thousands):

	December 31, 2021
Goodwill	\$ 212,190
Intangible assets, net	159,406
Total	\$ 371,596

We periodically review the carrying value of our goodwill and the estimated useful lives of our 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.

International trade, tax, and regulatory related risks

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

U.S. government actions are imposing greater restrictions and economic disincentives on international trade. It has initiated the imposition of additional tariffs on certain foreign goods, including steel and aluminum, semiconductor manufacturing equipment and spare parts thereof and has also announced the imposition of import license requirements on aluminum articles. The government has amended and expanded export regulations regarding sales to companies on the U.S. Entity List. These changes prevent sales of foreign produced direct product of the U.S. that is manufactured using controlled U.S.-origin equipment, technology, and software located outside the United States to companies on the U.S. Entity List. Additionally, the U.S. Department of Defense continues to issue lists of companies it has determined to be owned or controlled by China’s People’s Liberation Army on which sanctions could be levied by executive order, and the Department of Commerce continues to expand the list of designated military end users from PRC and Russia for whom export licenses are now required.

Furthermore, the government has determined that the Special Administrative Region of Hong Kong is no longer sufficiently autonomous to justify being treated as separate from PRC and has eliminated certain license exceptions for the export of controlled goods to Hong Kong and has removed Hong Kong as a separate shipping destination under the Export Administration Regulations ("EAR").

In response to U.S. Government actions, PRC passed numerous regulations, including the Export Control Law of the People’s Republic of China, effective December 1, 2020, the Rules on Counteracting Unjustified Extra-territorial Application of Foreign Legislation and Other Measures promulgated on January 9, 2021, and the Anti-Foreign Sanctions Law of the People’s Republic of China, released on July 24, 2021. These laws provide the PRC government with the framework to ban exports of strategic materials and advanced technologies to specific foreign entities on its Control List, block application of foreign laws, impose its own sanctions on entities and countries and provides a counterweight to the U.S. government’s restrictions through provisions for retaliatory action and extraterritorial jurisdiction.

Changes in U.S. trade policy could result in one or more U.S. trading partners adopting responsive trade policy making it more difficult or costly for us to export our products to those countries. As indicated above, these measures could also result in increased costs for goods imported into the U.S. This in turn could require us to increase prices to our customers which may reduce demand, or, if we are unable to increase prices, result in lowering our margin on goods and

services sold. To the extent that trade tariffs and other restrictions imposed by the U.S. increase the price of semiconductor equipment and related parts imported into the U.S., the cost of our materials may be adversely affected and the demand from customers for products and services may be diminished, which could adversely affect our revenues and profitability.

The adoption and expansion of trade restrictions, the occurrence of a trade war, or other governmental action related to tariffs, trade agreements, or policies has the potential to adversely impact demand for our products, our costs, our customers, our suppliers, and the U.S. economy, which in turn could adversely impact our business, financial condition, and results of operations.

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.

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 by their nature are complex and 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. As both domestic and foreign governments contemplate or make changes in tax law to raise more revenues, our results could be negatively affected. Further, 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 several other countries are actively considering changes in this regard.

Changes in our provision for income taxes or adverse outcomes resulting from examination of our income tax returns could adversely affect our results.

Our provision for income taxes is subject to volatility and could be adversely affected by earnings being lower than anticipated in countries that have lower tax rates and higher than anticipated in countries that have higher tax rates; by changes in the valuation of our deferred tax assets and liabilities; by changes, regulations, and interpretations of foreign-derived intangible income ("FDII"), global intangible low-tax income ("GILTI") and base erosion and anti-abuse tax laws ("BEAT"); by expiration of or lapses in tax incentives; by transfer pricing adjustments, including the effect of acquisitions on our legal structure; by tax effects of nondeductible compensation; by tax costs related to intercompany realignments; by changes in accounting principles; or by changes in tax laws and regulations, treaties, or interpretations thereof, including changes to the taxation of earnings of our foreign subsidiaries, the deductibility of expenses attributable to foreign income, and the foreign tax credit rules. Significant judgment is required to determine the

recognition and measurement attribute prescribed in the accounting guidance for uncertainty in income taxes. The Organization for Economic Co-operation and Development ("OECD"), an international association comprised of 36 countries, including the United States, has made changes to numerous long-standing tax principles. There can be no assurance that these changes, once adopted by countries, will not have an adverse impact on our provision for income taxes. Further, because of certain of our ongoing employment and capital investment actions and commitments, our income in certain countries is subject to reduced tax rates. Our failure to meet these commitments could adversely impact our provision for income taxes. In addition, we are the subject of regular examination of our income tax returns by tax authorities. We regularly assess the likelihood of adverse outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. There can be no assurance that the outcomes from these continuous examinations will not have an adverse effect on our operating results and financial condition.

Our business is subject to complex and evolving U.S. and international laws and regulations regarding privacy and data protection. Many of these laws and regulations are subject to change and uncertain interpretation and could result in claims, changes to our business practices, penalties, increased cost of operations, or declines in user growth or engagement, or otherwise harm our business.

Regulatory authorities around the world have implemented or are considering several legislative and regulatory proposals concerning data protection, including measures to ensure that encryption of users' data does not hinder law enforcement agencies' access to that data. In addition, the interpretation and application of consumer and data protection laws in the U.S., Europe and elsewhere are often uncertain and in flux. It is possible that these laws may be interpreted and applied in a manner that is inconsistent with our data practices. These legislative and regulatory proposals, if adopted, and such interpretations could, in addition to the possibility of fines, result in an order requiring that we change our data practices, which could have an adverse effect on our business and results of operations. Complying with these various laws could cause us to incur substantial costs or require us to change our business practices in a manner adverse to our business.

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. In addition, with our December 31, 2020 acquisition of Versatile Power, Inc., we expanded our presence in the medical market to include more highly regulated applications and added its medical-certified manufacturing center to our operating footprint. We may encounter increased costs to maintain compliance with the quality systems and other regulations and requirements that apply to the acquired business. 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 numerous imports, exports, 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 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 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 such minerals originate from the Democratic Republic of Congo and adjoining countries. We must perform sufficient due diligence to determine whether such minerals are 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 the components of our products are certified as conflict mineral free.

General Risk Factors

Our failure to maintain appropriate environmental, social, and governance ("ESG") practices and disclosures could result in reputational harm, a loss of customer and investor confidence, and adverse business and financial results.

Governments, investors, customers, and employees are enhancing their focus on ESG practices and disclosures, and expectations in this area are rapidly evolving and increasing. While we monitor the various and evolving standards and associated reporting requirements, failure to adequately maintain appropriate ESG practices that meet diverse stakeholder expectations may result in the loss of business, diluted market valuation, an inability to attract customers, and an inability to attract and retain top talent.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Information concerning our principal properties is set forth below:

Location	Principal Activity	Ownership
Denver, Colorado	Corporate headquarters, general and administrative	Leased
Fort Collins, Colorado	Research and development, distribution, sales, and service	Leased
Lockport, New York	Manufacturing, distribution, service, and research and development	Leased
Shenzhen, China	Manufacturing, distribution, service, and research and development	Leased
Zhongshan, China	Manufacturing	Leased
Penang, Malaysia	Manufacturing and distribution	Leased
Quezon, Philippines	Engineering, research and development, administration, and support	Leased
Rosario, Philippines	Manufacturing	Owned
Santa Rosa, Philippines	Manufacturing	Leased
Taipei, Taiwan	Sales, distribution, and service	Leased
Metzingen, Germany	Distribution, sales, and service	Leased
Hong Kong, Hong Kong	Distribution and general and administrative	Leased
Singapore, Singapore	Global operations headquarters (sales, service, and research and development)	Leased

In addition to the above principal properties, we have several other facilities throughout the US, North America, Europe, and Asia. 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 and a supplier 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. For further information see *Note 19. Commitments and Contingencies* in Part II, Item 8 "Financial Statements and Supplementary Data."

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

Principal Market

Our common stock is listed on the NASDAQ Global Select Market under the symbol "AEIS." On January 31, 2022, the number of common stockholders of record was approximately 300. This does not include stockholders whose shares are held in "street name" through brokers or other nominees.

Dividend Policy

In December 2020, the Board of Directors ("the Board") approved a dividend program, pursuant to which we intend to pay a regular quarterly cash dividend of \$0.10 per share of capital stock. In March 2021, we paid the first quarterly cash dividend since our inception as a public company. During the year ended December 31, 2021, we paid cash dividends totaling \$15.4 million. Future dividend payments are subject to the Board's approval.

Purchases of Equity Securities by the Issuer

The following table summarizes actions by our Board of Directors in relation to the stock repurchase program:

<u>Date</u>	<u>Action</u>
September 2015	Authorized a program to repurchase up to \$150.0 million of our common stock
May 2018	Approved a \$50.0 million increase in the repurchase program
December 2019	Authorized the removal of the expiration date and increased the balance available for the repurchase program by \$25.1 million
July 2021	Approved an increase to the repurchase program, which authorized the Company to repurchase up to \$200.0 million with no time limitation

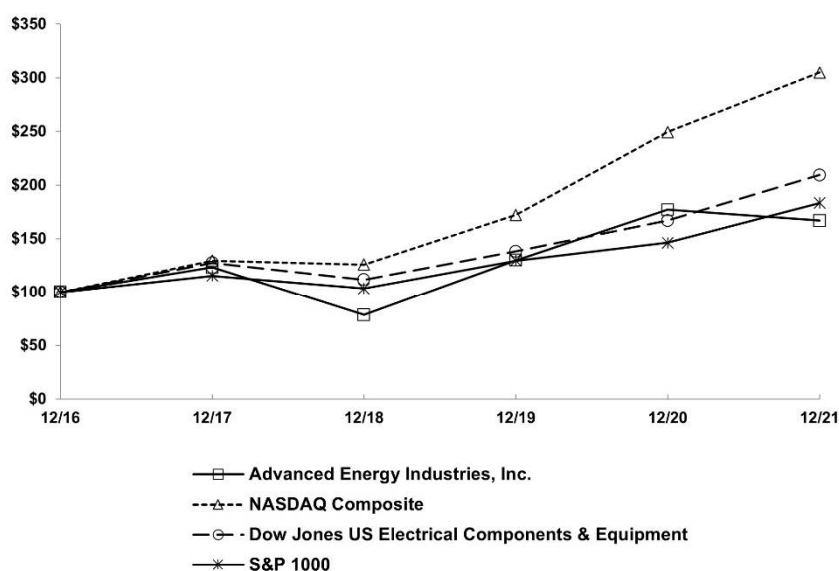
To execute the repurchase of shares of our common stock, we periodically enter into stock repurchase agreements. The following table summarizes these repurchases during the year ended December 31, 2021:

Month	Total Number of Shares Purchased	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs
	(in thousands, except price per share data)			
January	—	\$ —	—	\$ 38,369
February	—	\$ —	—	\$ 38,369
March	—	\$ —	—	\$ 38,369
First quarter	—	\$ —	—	
April	—	\$ —	—	\$ 38,369
May	72	\$ 90.34	72	\$ 31,866
June	—	\$ —	—	\$ 31,866
Second quarter	72	\$ 90.34	72	
July	8	\$ 94.34	8	\$ 199,218
August	338	\$ 86.45	338	\$ 170,002
September	259	\$ 87.32	259	\$ 147,444
Third quarter	605	\$ 85.12	605	
October	121	\$ 85.76	121	\$ 137,076
November	—	\$ —	—	\$ 137,076
December	103	\$ 84.38	103	\$ 128,377
Fourth quarter	224	\$ 85.12	224	
Total	901	\$ 86.76	901	\$ 128,377

Performance Graph

The performance graph below shows the five-year cumulative total stockholder return on our common stock in comparison to certain other indices during the period from December 31, 2016 through December 31, 2021. The comparison assumes \$100 invested on December 31, 2016 in Advanced Energy common stock and in each of the 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.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*
Among Advanced Energy Industries, Inc., the NASDAQ Composite, the Dow Jones US Electrical Components & Equipment Index and the S&P 1000 Index



*\$100 invested on 12/31/16 in stock or index, including reinvestment of dividends. Fiscal year ending December 31.

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	December 31,					
	2016	2017	2018	2019	2020	2021
Advanced Energy Industries, Inc.	\$ 100.00	\$ 123.25	\$ 78.41	\$ 130.05	\$ 177.11	\$ 167.03
NASDAQ Composite	100.00	129.64	125.96	172.17	249.51	304.85
Dow Jones US Electrical Components & Equipment	100.00	127.46	111.82	138.30	166.99	209.33
S&P 1000	100.00	115.33	103.45	129.46	146.26	183.34

Information relating to compensation plans under which our equity securities are authorized for issuance is set forth in Part III, Item 12 "Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters" of this Annual Report on Form 10-K.

ITEM 6. RESERVED

Not applicable.

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 this Annual Report on Form 10-K for additional factors relating to such statements and see "*Risk Factors*" in Part I, Item 1A for a discussion of certain risks applicable to our business, financial condition, and results of operations.

The following section discusses our results of operations for 2021 and 2020 and year-to-year comparisons between those periods. Discussions of 2019 and year-to-year comparisons between 2020 and 2019 are not included in this Form 10-K and can be found within Part II, Item 7 "Management's Discussion and Analysis for Financial Condition and Results of Operations" in our 2020 Form 10-K for the year ended December 31, 2020.

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, refine, and modify the raw electrical power coming from either the utility or the building facility and convert it into various types of highly controllable, usable power that is predictable, repeatable, and customizable to meet the necessary requirements for powering a wide range of complex equipment. Our power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition, high and low voltage applications such as semiconductor process control, data center computing, networking, telecommunication, medical equipment, life science applications, industrial technology and production, scientific instruments, clean technology production, advanced material production and temperature-critical thermal applications. We also supply related sensing, controls, and instrumentation products for advanced measurement and calibration of RF power and temperature, electrostatic instrumentation products for test and measurement applications, and gas sensing and monitoring solutions for multiple industrial markets. Our network of global service support centers provides a recurring revenue opportunity as we offer repair services, conversions, upgrades, refurbishments, and used equipment to companies using our products.

Our products are sold into the Semiconductor Equipment, Industrial and Medical, Data Center Computing, and Telecom and Networking markets, and we have provided market revenue data in this Annual Report on Form 10-K to enable tracking of trends. Advanced Energy is organized on a global, functional basis and operates in a single segment structure for power electronics conversion products.

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 us to make judgments, assumptions, and estimates that affect the amounts reported. *Note 1. Operations and Summary of Significant Accounting Policies and Estimates* in Part II, 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.

Business Combinations

We record the assets acquired and liabilities assumed in a business combination at their acquisition date fair values. Fair values of assets acquired, and liabilities assumed are based upon available information and may involve engaging an independent third party to perform an appraisal. Estimating fair values can be complex and subject to significant business judgment. We must also identify and include in the allocation all acquired tangible and intangible assets that meet certain criteria, including assets that were not previously recorded by the acquired entity. The estimates most commonly involve property, plant and equipment and intangible assets. The estimates also include the fair value of contracts including commodity purchase and sale agreements, storage contracts, and transportation contracts. The excess

of the purchase price over the net fair value of acquired assets and assumed liabilities is recorded as goodwill, which is not amortized but instead is evaluated for impairment at least annually. Pursuant to U.S. GAAP, an entity is allowed a reasonable period of time (not to exceed one year) to obtain the information necessary to identify and measure the fair value of the assets acquired and liabilities assumed in a business combination.

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 adjust 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 5. Income Taxes* in Part II, Item 8 "Financial Statements and Supplementary Data."

Inventory

We value our inventory at the lower of cost (first-in, first-out method) or net realizable value. 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. Our industry is subject to technological change, new product developments, and changes in end-user demand for our products which can fluctuate significantly. Any significant changes in end-user demand, technology or new product developments could have a significant impact on the value of our inventory and our reported operating results.

Defined Benefit Pension Plans

Accounting for pension plans requires that we make assumptions that involve considerable judgment which are significant inputs in the actuarial models that measure our net pension obligations and ultimately impact our earnings. These include the discount rate, long-term expected rate of return on assets, compensation trends, inflation considerations, health care cost trends and other assumptions, as well as determining the fair value of assets in our funded plans. Specifically, the discount rates, as well as the expected rates of return on assets and plan asset fair value determination, are important assumptions used in determining the plans' funded status and annual net periodic pension and benefit costs. We evaluate these critical assumptions at least annually on a plan and country-specific basis. We also, with the help of actuaries, periodically evaluate other assumptions involving demographic factors, such as retirement age, mortality, and turnover, and update them to reflect our experience and expectations for the future. We believe the accounting estimates related to our pension plans are critical accounting estimates because they are highly susceptible to change from period to period based on the performance of plan assets, actuarial valuations, market conditions and contracted benefit changes. While we believe that our assumptions are appropriate, significant differences in our actual

experience or significant changes in our assumptions may materially affect our net pension and postretirement benefit obligations and related expense.

Human Capital Resources

Our corporate citizenship, social responsibility and commitment to our employees extends beyond the products we make. We conduct anonymous surveys to seek feedback from our employees on important topics related to confidence in company leadership, career growth opportunities, and improvements on how we can make our company a great place to work. In addition, we share the results of the survey with our Board. To further increase our commitment to diversity and equity, in 2020 we announced the launch of our inaugural Advanced Energy STEM Diversity Scholarship, which is aimed at developing emerging talent and promoting greater ethnic, racial and gender diversity in STEM. The annual program accepts applications from undergraduate and post-graduate students attending five leading institutions in the field of power technologies.

Total Rewards

As part of our total rewards philosophy, we believe in offering and maintaining competitive compensation and benefits programs for our employees in order to attract and retain a talented, highly engaged workforce. Our compensation programs are focused on equitable, fair pay practices including market-based base pay, an annual pay-for-performance incentive plan, and discounted employee stock purchase plan. In addition to our competitive compensation practices, we offer a strong benefits package in each of the countries in which we operate. In the majority of our non-U.S. operations, we offer additional benefits that supplement governmental statutory benefits. In the U.S., we offer a competitive benefits package that includes four different health care plan options with employee premiums lower than the market average, dental, vision, disability and life insurance, health savings and flexible spending accounts, paid time off, 8-weeks of paid parental leave for both parents, company matched 401(k) contributions, flexible work schedules, expanded mental health coverage, and employee assistance programs. With the challenging times created by COVID-19, we continued our commitment to ensure our employees maintained financial security and provided certain employees the ability to work from home, paid leave time for our employees who may have been impacted by temporary site closures, and paid leave time for vaccinations.

Learning and Development

To support our employees in reaching their full potential and to build internal capabilities, we offer a wide range of internal and external learning and development opportunities. We have a program for education assistance reimbursement that provides financial support to employees who seek to expand their skills and abilities. We also have an internship program designed to help support a talent pipeline. We have a robust succession planning process to develop internal leadership capabilities and technical bench strength, ensuring we have a strong workforce for the future.

Diversity, Equity & Inclusion

In 2021, we relaunched our Corporate Inclusion, Diversity and Equity Steering Committee, which was tasked with researching, developing, and proposing strategies and initiatives aimed at creating and fostering engagement, awareness, respect, and inclusion for our employees, customers, vendors, and communities. This committee provides global guidance and direction while enabling local activities to develop specific, targeted initiatives as appropriate.

Health and Safety

We are committed to providing a safe work environment for our employees. We provide regular health and safety training in both on-site format and through our virtual training tool that assigns training requirements based on job profiles and site-specific requirements. Our Environmental, Health and Safety organization is a global team responsible for health and safety related to on-site operations, including hazard and risk identification. Workplace safety is also addressed in operations meetings and monthly business reviews. We are also committed to the standards of the Responsible Business Alliance Code of Conduct, which promotes labor, health and safety, environmental and ethics best practices.

Community Involvement

Our charitable contributions committee, founded in 2010, is supported and led by our employees. The committee provides financial support for 501(c)(3) corporations, non-profit institutions, and organizations that improve education, the environment, health, and social services across the communities in which we operate and where our employees live. We provide financial support to workforce initiatives led by the local chamber of commerce in northern Colorado and partnered with a community college to provide equipment and funding to train technicians and develop skilled labor that may lead to employment opportunities with us or other local companies. We offer each employee eight hours of paid time off to volunteer with a 501(c)(3) organization of the employee's choosing. Our Educational Scholarship Program, available to children of Advanced Energy employees, celebrates education accomplishments and facilitates career and learning goals.

Business Environment and Trends

Advanced Energy operates in a single segment structure for power electronics conversion products. We operate in four vertical markets or applications and provide revenue information to enable tracking of market trends.

The demand environment in each of our markets is impacted by various market trends, customer buying patterns, design wins, macroeconomic and other factors. During 2021 we saw growth in our Semiconductor Equipment and Industrial and Medical markets but weakening demand in our Data Center Computing and Telecom and Networking markets.

At the beginning of 2020 we saw the spread of COVID-19, which grew into a global pandemic. Our focus on providing a healthy and safe working environment for our employees led to intermittent shutdowns of our manufacturing facilities to implement new health and safety protocols and additional investments to comply with government guidelines. During 2020 and 2021 there were periods when some of our manufacturing facilities were not operating or were operating at reduced capacity due to government mandates to restrict travel, maintain social distancing, and implement health and safety procedures. Additionally, ongoing restrictions related to COVID-19 and disruptions in an already challenged global supply chain limited the availability of certain materials, parts, subcomponents, and subassemblies needed for production during 2021, impacting our ability to ship product to meet customer demand. The shortage of critical components was caused in part by the pandemic-driven rise in consumer demand for technology goods, increased demand for electronic components used in a wide variety of industries, logistics-related disruptions in shipping, and capacity limitations at some suppliers due to COVID-19, its variants, labor shortages, and other factors. See Part I, Item 1A "Risk Factors" for a discussion of certain risks related to COVID-19.

SEMICONDUCTOR EQUIPMENT MARKET

Growth in the Semiconductor Equipment market is driven by growing integrated circuits content across many industries, increased demand for processing and storage in advanced applications such as artificial intelligence, cloud computing, and autonomous vehicles, and the rapid adoption of advanced mobile connectivity solutions such as 5G, which enhances existing and enables new wireless applications. To address the long-term growing demand for semiconductor devices, the industry continues to invest in production capacities for both leading-edge and trailing-edge nodes, logic devices, the latest memory devices including 3D-NAND, DRAM, and new emerging memories such as MRAM, and back-end test and advanced wafer-level packaging. The industry's transition to advanced technology nodes in logic and DRAM and to increased layers in 3D-NAND memory devices require an increased number of plasma-based etch and deposition process tools and higher content of our advanced power solutions per tool. As etching and deposition processes become more challenging due to increasing aspect ratios in advanced 3D devices, more advanced RF, and DC technologies are needed. We are meeting these challenges by providing a broader range of more complex RF and DC power solutions. Beyond etch and deposition processes, the growing complexity at the advanced nodes also drive a higher number of other processes across the wafer fab, including inspection, metrology, thermal, ion implantation, and semiconductor test, where Advanced Energy is actively participating as a critical technology provider. In addition, our global support services group offers comprehensive local repair service, upgrade, and retrofit offerings to extend the useable life of our customers' capital equipment for additional technology generations. The acquisition of Artesyn in September 2019 expanded Advanced Energy's reach within the Semiconductor Equipment market by adding a broad

range of low voltage applications as well as back-end test and assembly equipment makers. Our strategy in the Semiconductor Equipment market is to defend our proprietary positions in our core applications, grow our market position in applications where we have lower share, including remote plasma source and dielectric etch, and leverage our product portfolio in areas such as embedded power, high voltage power system, and critical sensing and controls to grow our share and contents at our key OEM customers.

The Semiconductor Equipment market is experiencing continued demand growth since 2019, driven by higher semiconductor contents across many industries, increased capital intensity at the leading-edge process nodes, semiconductor device makers investing in the trailing-edge nodes due to supply constraints and increased regional investments of semiconductor capacities. Advanced Energy participated in this market growth by delivering record revenue from the Semiconductor Equipment market in 2021, even with the negative impact of limited availability of critical parts due to global supply constraints. In addition, increased demand for semiconductor devices for a wide range of applications as global economies begin to recover is expected to drive investment in new capacity throughout 2022.

INDUSTRIAL AND MEDICAL MARKET

Customers in the Industrial and Medical market incorporate our advanced power, embedded power, and measurement products into a wide variety of equipment used in applications such as advanced material fabrication, medical devices, analytical instrumentation, test and measurement equipment, robotics, horticulture, motor drives, and connected light-emitting diodes.

OEM customers design equipment utilizing our process power technologies in a variety of industrial production applications including glass coating, glass manufacturing, flat panel displays, photovoltaics solar cell manufacturing, and similar thin film manufacturing, including data storage and decorative, hard and optical coatings. These applications employ similar technologies to those used in the Semiconductor Equipment market to deposit films on non-semiconductor substrates. Our strategy around these applications is to leverage our thin film deposition technologies into an expanded set of new materials and applications in adjacent markets.

Advanced Energy serves the Industrial and Medical market with mission-critical power components that deliver high reliability, precise, low noise or differentiated power to the equipment they serve. Examples of products sold into the Industrial and Medical market includes high voltage products for analytical instrumentation, medical equipment, low voltage power supplies used in applications for medical devices, test and measurement, medical lasers, scientific instrumentation and industrial equipment, and power control modules and thermal instrumentation products for material fabrication, processing, and treatment. Our gas monitoring products serve multiple applications in the energy market, air quality monitoring and automobile emission monitoring and testing. The acquisition of Artesyn in September 2019 substantially expanded Advanced Energy's portfolio of products and opportunities in the Industrial and Medical market. In the first half of 2020, the COVID-19 pandemic impacted demand for our products in this market, but demand started to recover in the second half of 2020. Our strategy in the Industrial and Medical market is to expand our product offerings and channel reach, leveraging common platforms, derivatives, and customizations to further penetrate a broader set of applications, such as medical, test and measurement, horticulture, and many other industrial applications.

During 2021, we saw improvement in industrial markets as global economic growth resumed and our customers were able to increase capacity after governmental restrictions were relaxed during the second half of 2020. Demand for medical products during 2020 was driven by critical care applications, offset by lower investment related to elective procedures. During 2021, demand for critical applications has declined while other demand has improved. During 2021, overall customer demand improved, but supply constraints of critical components limited our ability to ship product at the level of customer demand. However, even with the limited supply, revenue from the Industrial and Medical market grew in the year as a result of our growth strategy. We expect demand in the Industrial and Medical market to grow in 2022, but the supply constraint condition has extended into the year. It is not clear how long these supply shortages will persist or how quickly our supply will recover.

DATA CENTER COMPUTING MARKET

Following the acquisition of Artesyn in September 2019, Advanced Energy entered the Data Center Computing market with industry leading power conversion products and technologies, which we sell to OEMs and ODMs of data center server and storage systems, as well as cloud service providers and their partners. Driven by the growing adoption of cloud computing, market demand for server and storage equipment has shifted from enterprise on-premises computing to the data center, driving investments in data center infrastructure. In addition, the data center industry has started to transition to 48 Volt infrastructure, where 48 Volt DC power replaces 12 Volt in server racks in order to improve overall power efficiency. Advanced Energy benefits from these trends by leading the industry in providing 48 Volt server power solutions to the data center industry. Further, demand for edge computing is growing, driven by the need for faster processing, lower latency, higher data security, and more reliability than traditional cloud computing. With a wide range of many unique configurations and requirements, edge computing creates additional opportunities for Advanced Energy. Lastly, the rapid growth and adoption of Artificial Intelligence and machine learning is driving accelerated demand for server and storage racks with increased power density and higher efficiency, which plays well to Advanced Energy's strengths. With a growing presence at both cloud service providers and industry leading data center server and storage vendors, we believe Advanced Energy is well positioned to continue to capitalize on the ongoing shift towards cloud computing. Our strategy in the Data Center and Computing market is to penetrate additional customers and applications based on our differentiated capability and competitive strengths in power density, efficiency, and controls.

In late 2019 and through 2020, demand for our embedded power products in the Data Center Computing market increased significantly driven by our share gains and a capacity ramp at hyperscale customers. In addition, we believe as a consequence of COVID-19, hyperscale demand has risen in the near term given the increased need for cloud and network applications in the current environment. Demand declined in the second half of 2020 as a result of market digestion but started to recover during 2021. However, our 2021 revenue declined due to the limited availability of parts given global supply constraints, which prevented us from producing products to meet the growing demand. We expect demand in this market to grow in 2022, but the supply constraint condition has extended into this year. It is not clear how long these supply shortages will persist or how quickly our supply will recover.

TELECOM AND NETWORKING MARKET

The acquisition of Artesyn in September 2019 provided Advanced Energy with a portfolio of products and technologies that are used across the Telecom and Networking market. Our customers include many leading vendors of wireless infrastructure equipment, telecommunication equipment and computer networking. The wireless telecom market continues to evolve with more advanced mobile standards. 5G wireless technology promises to drive substantial growth opportunities for the telecom industry as it enables new advanced applications such as autonomous vehicles and virtual/augmented reality. Telecom service providers have started to invest in 5G, and this trend is expected to drive demand of our products into the Telecom and Networking market. In datacom, demand is driven by networking investments by telecom service providers and enterprises upgrading of their network, as well as cloud service providers and data centers investing in their networks for increased bandwidth. Our strategy in Telecom and Networking is to optimize our portfolio of products to more differentiated applications, and to focus on 5G infrastructure applications primarily with U.S. and European equipment providers.

Demand in late 2019 and the first half of 2020 was lower as geopolitical issues and consolidation of wireless telecom providers drove slower global investment in cellular and network infrastructure. Revenue increased sequentially in the third and fourth quarters of 2020, primarily as a result of modest improvement in market conditions and improved manufacturing capacity amid COVID-19. During 2021, revenue declined as a result of the limited availability of parts given global supply constraints and our internal decision to optimize our portfolio toward higher margin applications within the Telecom and Networking market. Going into 2022, we expect demand in this market to recover driven by increased investments in 5G infrastructure, but the supply constraint condition has extended into the year. It is not clear how long these supply shortages will persist or how quickly our supply will recover.

Results of Continuing Operations

The analysis presented below is organized to provide the information we believe will be helpful for 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 Part II, Item 8 "Financial Statements and Supplementary Data" of this Annual Report on Form 10-K. Also included in the following analysis are measures that are not in accordance with U.S. GAAP. A reconciliation of the non-GAAP measures to U.S. GAAP is provided below.

The following table sets forth certain data derived from our Consolidated Statements of Operations (in thousands):

	<u>Year Ended December 31,</u>	
	<u>2021</u>	<u>2020</u>
Sales	\$ 1,455,954	\$ 1,415,826
Gross profit	532,322	541,869
Operating expenses	<u>380,641</u>	<u>365,846</u>
Operating income from continuing operations	151,681	176,023
Other income (expense), net	<u>(2,970)</u>	<u>(17,876)</u>
Income from continuing operations before income taxes	148,711	158,147
Provision for income taxes	<u>14,004</u>	<u>22,996</u>
Income from continuing operations, net of income taxes	<u>\$ 134,707</u>	<u>\$ 135,151</u>

The following table sets forth the percentage of sales represented by certain items reflected in our Consolidated Statements of Operations:

	<u>Year Ended December 31,</u>	
	<u>2021</u>	<u>2020</u>
Sales	100.0 %	100.0 %
Gross profit	36.6	38.3
Operating expenses	<u>26.1</u>	<u>25.8</u>
Operating income from continuing operations	10.4	12.4
Other income (expense), net	<u>(0.2)</u>	<u>(1.3)</u>
Income from continuing operations before income taxes	10.2	11.2
Provision for income taxes	<u>1.0</u>	<u>1.6</u>
Income from continuing operations, net of income taxes	<u>9.3 %</u>	<u>9.5 %</u>

SALES, NET

The following tables summarize annual sales and percentages of sales by markets (in thousands):

	Year Ended December 31,		Change 2021 v. 2020	
	2021	2020	Dollar	Percent
Semiconductor Equipment	\$ 710,174	\$ 611,864	\$ 98,310	16.1 %
Industrial and Medical	341,176	313,646	27,530	8.8
Data Center Computing	270,924	322,539	(51,615)	(16.0)
Telecom and Networking	133,680	167,777	(34,097)	(20.3)
Total	\$ 1,455,954	\$ 1,415,826	\$ 40,128	2.8 %

	Years Ended December 31,	
	2021	2020
Semiconductor Equipment	48.8 %	43.2 %
Industrial and Medical	23.4	22.1
Data Center Computing	18.6	22.8
Telecom and Networking	9.2	11.9
Total	100.0 %	100.0 %

OPERATING EXPENSE

The following table summarizes our operating expense as a percentage of sales (in thousands):

	Years Ended December 31,			
	2021		2020	
Research and development	\$ 161,831	11.1 %	\$ 143,961	10.2 %
Selling, general, and administrative	191,998	13.2	188,590	13.3
Amortization of intangible assets	22,060	1.5	20,129	1.4
Restructuring charges	4,752	0.3	13,166	0.9
Total operating expenses	\$ 380,641	26.1 %	\$ 365,846	25.8 %

2021 Results Compared To 2020

SALES

Sales increased \$40.1 million, or 2.8%, to \$1,456.0 million, as compared to \$1,415.8 million in the prior year. The increase in sales was primarily due to increased demand and shipments in the Semiconductor Equipment and Industrial and Medical markets, offset by lower sales from the Data Center Computing market and the Telecom and Networking market. In addition, the first half of 2020 was negatively impacted by factory shutdowns related to COVID-19. Revenues in 2021 were negatively impacted across all of our markets by supply chain shortages for certain IC's and other components, which limited our ability to ship to our total demand.

Sales in the Semiconductor Equipment market increased \$98.3 million, or 16.1%, to \$710.2 million, as compared to \$611.9 million in the prior year. The increase in sales during 2021 is primarily due to an overall increase in demand for semiconductor equipment used in deposition and etch applications, increasing power content in semiconductor manufacturing tools, and market share gains in several areas across our portfolio.

Sales to the Industrial and Medical market increased \$27.5 million, or 8.8%, to \$341.2 million, as compared to \$313.6 million in the prior year. Our customers in this market are primarily global and regional original equipment and device manufacturers. The increase in sales year to date was primarily due to improving macroeconomic conditions and the continued recovery from the COVID-19 pandemic driving stronger demand.

Sales in the Data Center Computing market decreased \$51.6 million, or 16.0%, to \$270.9 million, as compared to \$322.5 million in the prior year. The decrease in Data Center Computing market sales is due in part to digestion of equipment at key accounts following strong revenue last year and supply constraints, which limited our ability to ship sufficiently to meet customer demand.

Sales in the Telecom and Networking market decreased \$34.1 million, or 20.3%, as compared to \$167.8 million in the prior year. The decrease in sales was due to in part to our decision to optimize our product portfolio towards higher margin applications and production limitations due to supply constraints. Over time, we expect that 5G infrastructure investments and upgrades to enterprise networks will drive growth in this market.

Our acquisitions of TEGAM and Versatile Power contributed \$12.1 million to 2021 sales. See *Note 2: Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data" for details.

BACKLOG

The following table summarizes our backlog (in thousands):

	December 31,	December 31,	Change	
	2021	2020	Dollar	Percent
Backlog	\$ 927,810	\$ 290,681	\$ 637,129	219.2 %

GROSS PROFIT

Gross profit decreased \$9.5 million to \$532.3 million, or 36.6% of revenue, as compared to \$541.9 million, or 38.3%, in the prior year. The decrease in gross profit as a percent of revenue is largely related to higher material and freight costs. Additional drivers of our decrease in gross profit include productivity inefficiencies resulting from supply constraints, COVID-19 capacity restrictions, and the transition of our Shenzhen, PRC manufacturing to Penang, Malaysia. These decrease drivers were partly offset by increased volume and favorable product mix.

OPERATING EXPENSE

Research and Development

We perform R&D to develop new or emerging applications, technological advances to provide higher performance, or significant enhancements. We believe that continued development of technological applications, as well as enhancements to existing products and related software 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.

R&D expenses increased \$17.9 million to \$161.8 million, as compared to \$144.0 million in the prior year. The increase in research and development expense is related to increased headcount and associated costs, outside technical services, and engineering materials as we invested in new programs to maintain and increase our technological leadership and provide solutions to our customers' evolving needs. Our recent acquisitions of Versatile Power and TEGAM resulted in a combined increase of \$2.5 million to R&D expenses. See *Note 2: Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data" for additional details.

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 \$3.4 million to \$192.0 million, as compared to \$188.6 million in the prior year. The increase in SG&A is principally related to acquisition related activity partially offset by a reduction in variable compensation. See *Note 2: Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data" for additional details.

Amortization of Intangibles

Amortization expense increased \$1.9 million to \$22.1 million, as compared to \$20.1 million in the prior year. The increase in 2021 was primarily driven by incremental amortization of newly acquired intangible assets. For additional information, see *Note 13. Intangible Assets* in Part II, Item 8 "Financial Statements and Supplementary Data."

Restructuring

Restructuring charges relate to previously announced management plans to optimize our manufacturing footprint to lower cost regions, improvements in operating efficiencies, and synergies related to acquisitions. For additional information, see *Note 14. Restructuring Costs* in Part II, Item 8 "Financial Statements and Supplementary Data."

Other Income (Expense), net

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), net was (\$3.0) million in 2021, as compared to (\$17.9) million in the prior year. The decrease between periods is primarily due to decreased interest expense related to our term note due to lower interest rates, as well as more favorable impacts from foreign exchange rate changes and gains on certain acquisition related reserves.

Provision for Income Taxes (in thousands)

	<u>Years Ended December 31,</u>		
	<u>2021</u>	<u>2020</u>	<u>2019</u>
Income from continuing operations, before income taxes	\$ 148,711	\$ 158,147	\$ 67,194
Provision for income taxes	\$ 14,004	\$ 22,996	\$ 10,699
Effective tax rate	9.4 %	14.5 %	15.9

Our effective tax rates differ from the U.S. federal statutory rate of 21% for the years ended December 31, 2021, 2020, and 2019, primarily due to the benefit of earnings in foreign jurisdictions which are subject to lower tax rates, as well as reductions in uncertain tax positions and tax credits, offset by net U.S. tax on foreign operations, withholding taxes, and audit settlements. The effective tax rate for 2021 was lower than the same period in 2020, primarily due to the mix of discrete events between the two periods.

Our future effective income tax rate depends on various factors, such as changes in tax laws, regulations, accounting principles, or interpretations thereof, and the geographic composition of our pre-tax income. We carefully monitor these factors and adjust our effective income tax rate accordingly.

Non-GAAP Results

Management uses non-GAAP operating income and non-GAAP earnings per share ("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 stock-based compensation and amortization of intangible assets. In addition, they exclude discontinued operations and other non-recurring items such as acquisition-related costs and restructuring expenses, 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 and effect of adoption of the Tax Cuts and Jobs Act.

Reconciliation of non-GAAP measure - operating expenses and operating income from continuing operations, excluding certain items (in thousands)	Years Ended December 31,	
	2021	2020
Gross profit from continuing operations, as reported	\$ 532,322	\$ 541,869
Adjustments to gross profit:		
Stock-based compensation	764	567
Facility expansion, relocation costs and other	6,189	4,349
Acquisition-related costs	3,585	5,381
Non-GAAP gross profit	542,860	552,166
Non-GAAP gross margin	37.3%	39.0%
Operating expenses from continuing operations, as reported	380,641	365,846
Adjustments:		
Amortization of intangible assets	(22,060)	(20,129)
Stock-based compensation	(14,975)	(11,705)
Acquisition-related costs	(6,803)	(10,209)
Facility expansion, relocation costs and other	(229)	(2,213)
Restructuring charges	(4,752)	(13,166)
Non-GAAP operating expenses	331,822	308,424
Non-GAAP operating income	\$ 211,038	\$ 243,742
Non-GAAP operating margin	14.5%	17.2%

Reconciliation of non-GAAP measure - income from continuing operations, excluding certain items (in thousands, except per share amounts)	Year Ended December 31,	
	2021	2020
Income from continuing operations, less non-controlling interest, net of income taxes	\$ 134,663	\$ 135,096
Adjustments:		
Amortization of intangible assets	22,060	20,129
Acquisition-related costs	10,388	15,590
Facility expansion, relocation costs, and other	6,418	6,562
Restructuring charges	4,752	13,166
Unrealized foreign currency (gain) loss	(3,543)	8,384
Acquisition-related costs and other included in other income (expense), net	(2,186)	716
Tax effect of non-GAAP adjustments	(1,346)	(7,611)
Non-GAAP income, net of income taxes, excluding stock-based compensation	171,206	192,032
Stock-based compensation, net of taxes	12,042	9,418
Non-GAAP income, net of income taxes	\$ 183,248	\$ 201,450
Non-GAAP diluted earnings per share	\$ 4.78	\$ 5.23

Impact of Inflation

In recent years, inflation has not had a significant impact on our operations. However, more recently we are experiencing price increases in select components driven by higher global demand, supply chain disruptions, and increased freight costs. 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. From time to time, we may also reduce prices to customers based on reductions in the cost structure of our products from cost improvement initiatives and decreases in component part prices.

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, cash generated from current operations, and available borrowing capacity under the Revolving Facility (defined below).

On December 31, 2021, we had \$546.7 million in cash, cash equivalents, and marketable securities.

We believe the above sources of liquidity will be adequate to meet anticipated working capital needs, anticipated levels of capital expenditures, contractual obligations, debt repayment, share repurchase programs, and dividends for the next twelve months and on a long-term basis. We may, however, depending upon the number or size of additional acquisitions, seek additional financing from time to time.

Credit Facility

In September 2019, in connection with the Artesyn Acquisition Agreement, we entered into a credit agreement ("Credit Agreement") that provided aggregate financing of \$500.0 million, consisting of a \$350.0 million senior unsecured term loan facility (the "Term Loan Facility") and a \$150.0 million senior unsecured revolving facility (the "Revolving Facility" and together with the Term Loan Facility, the "Credit Facility").

In April 2020, we executed interest rate swap contracts with independent financial institutions to partially reduce the variability of cash flows in LIBOR indexed debt interest payments on our Term Loan Facility (under our existing Credit Agreement dated September 10, 2019, as amended). The interest rate swap contracts fixed a portion of the outstanding principal balance on our term loan to a total interest rate of 1.271%. See *Note 8. Derivative Financial Instruments* in Part II, Item 8 "Financial Statements and Supplemental Data" for additional information.

In September 2021, we amended the Credit Agreement whereby we borrowed an additional \$85.0 million, which increased the aggregate amount outstanding under the Term Loan Facility to \$400.0 million. In addition, we increased the Revolving Facility capacity by \$50.0 million to \$200.0 million. Both the Term Loan Facility and Revolving Facility mature on September 9, 2026.

On December 31, 2021, we had \$200.0 million in available funding under the Revolving Facility. The Term Loan Facility requires quarterly repayments of \$5.0 million plus accrued interest, with the remaining balance due in September 2026. For more information on the Credit Facility, see *Note 21. Credit Facility* and *Note 8. Derivative Financial Instruments* in Part II, Item 8 "Financial Statements and Supplemental Data" for additional information.

Dividends

In December 2020, the Board approved a dividend program under which we began paying and intend to continue to pay a quarterly cash dividend of \$0.10 per share of capital stock. In March 2021, we paid the first quarterly cash dividend since our inception as a public company. During 2021, we paid cash dividends totaling \$15.4 million. Future dividend payments are subject to the Board's future discretion and approval.

Share Repurchase

To execute the repurchase of shares of our common stock, we periodically enter into stock repurchase agreements. The following table summarizes these repurchases:

(in thousands, except per share amounts)	Years Ended December 31,	
	2021	2020
Amount paid to repurchase shares	\$ 78,125	\$ 11,630
Number of shares repurchased	901	244
Average repurchase price per share	\$ 86.76	\$ 47.75
Remaining authorized by Board of Directors for future repurchases as of period end	\$ 128,377	\$ 38,369

On July 29, 2021, the Board approved an increase to the share repurchase program, which authorized the Company to repurchase up to \$200 million in shares of our common stock with no time limitation.

Cash Flows

A summary of our cash from operating, investing, and financing activities was as follows (in thousands):

	Years Ended December 31,	
	2021	2020
Net cash from operating activities from continuing operations	\$ 140,914	\$ 202,159
Net cash from operating activities from discontinued operations	(669)	(923)
Net cash from operating activities	140,245	201,236
Net cash from investing activities from continuing operations	(47,302)	(42,840)
Net cash from financing activities from continuing operations	(25,372)	(29,612)
Effect of currency translation on cash and cash equivalents	(3,567)	5,143
Increase in cash and cash equivalents	64,004	133,927
Cash and cash equivalents, beginning of period	480,368	346,441
Cash and cash equivalents, end of period	\$ 544,372	\$ 480,368

Net Cash From Operating Activities

Net cash from operating activities was \$140.9 million, a decrease of \$61.3 million, compared to \$202.2 million in the prior year. The decrease in net cash flows from operating activities as compared to 2020 was due to an unfavorable increase in net operating assets driven primarily by our increased investment in inventory as we attempted to mitigate supply chain constraints. This was partially offset by an increase in accounts payable.

Net Cash From Investing Activities

Net cash from investing activities in 2021 was (\$47.3) million, driven by the following:

- (\$31.9) million in purchases of property and equipment as we invested in our manufacturing footprint and capacity;
- (\$21.5) million for business combinations; and
- \$6.1 million related to receipts on notes receivable and proceeds from sale of assets.

Net cash from investing activities in 2020 was (\$42.8) million, and primarily related to investment in facilities and capacity.

Net Cash From Financing Activities

Net cash from financing activities in 2021 was (\$25.4) million and included:

- \$83.7 million in proceeds from borrowings, net of debt-issuance costs paid;
- (\$15.4) million for dividend payments;
- (\$13.8) million for repayment of long-term debt;
- (\$78.1) million related to repurchases of our common stock; and
- \$ (1.8) million in net payments related to stock-based award activities.

The net cash from financing activities in 2020 was (\$29.6) million and included:

- (\$17.5) million for repayment of long-term debt;
- (\$11.6) million related to repurchases of our common stock; and (\$0.5) million related to stock-based award activities.

Off-Balance Sheet Arrangements

As of December 31, 2021, we did not have any off-balance sheet arrangements, as defined in Item 303(a)(4)(ii) of Regulation S-K.

Contractual Obligations

In the normal course of business, we enter into contracts and commitments that obligate us to make payments in the future. Information regarding our obligations relating to income taxes, lease obligations, pension liabilities, and debt are provided in *Note 5. Income Taxes*, *Note 16. Leases*, *Note 17. Pension Liability* and *Note 21. Credit Facility*, respectively, in Part II, Item 8 "Financial Statements and Supplementary Data."

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 Part II, 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.

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.

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 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 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.

The functional currencies of our worldwide facilities primarily include the United States Dollar (USD), Euro, South Korean Won, New Taiwan Dollar, Japanese Yen, Pound Sterling, and Chinese Yuan. Our purchasing and sales activities are primarily denominated in the USD, Japanese Yen, Euro, and Chinese Yuan.

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.

As currencies fluctuate against each other we are exposed to foreign currency exchange rate risk on sales, purchasing transactions, and labor. Exchange rate fluctuations could require us to increase prices to foreign customers, which could result in lower net sales. 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. Changes in the relative buying power of our customers may impact sales volumes.

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 may be denominated in foreign currency. Changes in exchange rates therefore may have a material impact on their valuation in USD and 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.

Interest Rate Risk

Our market risk exposure relates primarily to changes in interest rates on our Credit Facility. The following table summarizes borrowings (in thousands) under our Credit Facility and the associated interest rate.

	December 31, 2021		
	Balance	Interest Rate	Unused Line Fee
Term Loan Facility subject to a fixed interest rate	\$ 255,719	1.271%	—
Term Loan Facility subject to a variable interest rate	139,281	0.890%	—
Revolving Facility subject to a variable interest rate	—	0.890%	0.10%
Total borrowings under the Credit Agreement	<u>\$ 395,000</u>		

For more information on the Term Loan Facility see *Note 21. Credit Facility* in Part II, Item 8 "Financial Statements and Supplementary Data." For more information on the interest rate swap that fixes the interest rate for a portion of our Term Loan Facility, see *Note 8. Derivative Financial Instruments* in Part II, Item 8 "Financial Statements and Supplementary Data." The Term Loan Facility and Revolving Facility bear interest, at our option, at a rate based on a reserve adjusted "Eurodollar Rate" or "Base Rate," as defined in the Credit Agreement, plus an applicable margin.

Our interest payments are impacted by interest rate fluctuations. With respect to the portion of our Credit Facility that is subject a variable interest rate, a hypothetical increase of 100 basis points (1%) in interest rates would have a \$1.4 million annual impact on our interest expense. A change in interest rates does not have a material impact upon our future earnings and cash flow for fixed rate debt. However, increases in interest rates could impact our ability to refinance existing maturities and acquire additional debt on favorable terms.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

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Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Advanced Energy Industries, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Advanced Energy Industries, Inc. (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2021, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 16, 2022 expressed an unqualified opinion thereon.

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 regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Description of the Matter **Accounting for income taxes**
For the year-ended December 31, 2021, the Company recognized a provision for income taxes of \$14.0 million. As described in Notes 1 and 5 to the consolidated financial statements, the Company is subject to income taxes in the United States and various foreign jurisdictions, which affect the Company's provision for income taxes. Management exercises judgment in interpretation and application of complex tax law when determining the Company's provision for income taxes.

Evaluating management's application of current tax regulations in various tax jurisdictions and the impact of those regulations on the Company's foreign and United States federal income tax provisions required complex auditor judgment and the use of tax subject matter professionals with specialized skills.

How We Addressed the Matter in Our Audit We obtained an understanding, evaluated the design and tested the operating effectiveness of the controls over the Company's accounting for income taxes. For example, we tested controls over management's review of the tax provision which includes their review of the underlying data used in the provision, foreign income inclusions reflected in the United States federal income tax provision and the basis by which the Company achieves certain tax holidays in foreign jurisdictions.

To test the Company's provision for income taxes, we performed audit procedures that included, among others, testing the calculation of the provision, including the completeness and accuracy of the underlying data. We tested the tax rates used by management in the computation of the provision including compliance with tax holiday requirements. We assessed the reasonableness of profit margin by tax jurisdiction related to intercompany transactions. We also tested calculations of foreign income inclusions included in the Company's United States federal income tax provision. As part of these procedures, we engaged tax subject matter professionals with knowledge of and experience with international and local income tax laws to evaluate the application of these regulations to the Company's tax positions. We have also evaluated the Company's income tax disclosures included in Note 5 of the consolidated financial statements in relation to these matters.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2019.

Denver, Colorado
March 16, 2022

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

	December 31, 2021	December 31, 2020
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 544,372	\$ 480,368
Marketable securities	2,296	2,654
Accounts and other receivable, net	237,227	235,178
Inventories	338,410	221,346
Income taxes receivable	10,768	4,804
Other current assets	29,161	35,899
Total current assets	<u>1,162,234</u>	<u>980,249</u>
Property and equipment, net	114,830	114,731
Operating lease right-of-use assets	101,769	103,858
Deposits and other assets	19,669	19,101
Goodwill	212,190	209,983
Intangible assets, net	159,406	168,939
Deferred income tax assets	47,242	50,801
TOTAL ASSETS	<u>\$ 1,817,340</u>	<u>\$ 1,647,662</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 193,708	\$ 125,224
Income taxes payable	9,226	11,850
Accrued payroll and employee benefits	55,833	63,487
Other accrued expenses	53,445	49,565
Customer deposits and other	22,141	12,179
Current portion of long-term debt	20,000	17,500
Current portion of operating lease liabilities	15,843	16,592
Total current liabilities	<u>370,196</u>	<u>296,397</u>
Long-term debt, net	372,733	304,546
Operating lease liabilities	95,180	95,993
Pension benefits	67,255	80,447
Deferred income tax liabilities	9,921	10,088
Uncertain tax positions	5,940	12,839
Long-term deferred revenue	6,200	7,352
Other long-term liabilities	18,419	24,660
Total liabilities	<u>945,844</u>	<u>832,322</u>
Commitments and contingencies (Note 19)		
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; 37,589 and 38,293 issued and outstanding at December 31, 2021 and 2020, respectively	38	38
Additional paid-in capital	115,706	105,009
Accumulated other comprehensive loss	(1,216)	(2,605)
Retained earnings	756,323	712,297
Advanced Energy stockholders' equity	<u>870,851</u>	<u>814,739</u>
Noncontrolling interest	645	601
Total stockholders' equity	<u>871,496</u>	<u>815,340</u>
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	<u>\$ 1,817,340</u>	<u>\$ 1,647,662</u>

The accompanying notes are an integral part of these consolidated financial statements

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

	Years Ended December 31,		
	2021	2020	2019
Sales, net	\$ 1,455,954	\$ 1,415,826	\$ 788,948
Cost of sales	923,632	873,957	473,296
Gross profit	532,322	541,869	315,652
Operating expenses:			
Research and development	161,831	143,961	101,503
Selling, general, and administrative	191,998	188,590	142,555
Amortization of intangible assets	22,060	20,129	12,168
Restructuring expense	4,752	13,166	5,038
Total operating expenses	380,641	365,846	261,264
Operating income	151,681	176,023	54,388
Other income (expense), net	(2,970)	(17,876)	12,806
Income from continuing operations, before income taxes	148,711	158,147	67,194
Provision for income taxes	14,004	22,996	10,699
Income from continuing operations	134,707	135,151	56,495
Income (loss) from discontinued operations, net of income taxes	73	(421)	8,480
Net income	\$ 134,780	\$ 134,730	\$ 64,975
Income from continuing operations attributable to noncontrolling interest	44	55	34
Net income attributable to Advanced Energy Industries, Inc.	\$ 134,736	\$ 134,675	\$ 64,941
Basic weighted-average common shares outstanding	38,143	38,314	38,281
Diluted weighted-average common shares outstanding	38,355	38,542	38,495
Earnings per share:			
Continuing operations:			
Basic earnings per share	\$ 3.53	\$ 3.53	\$ 1.47
Diluted earnings per share	\$ 3.51	\$ 3.51	\$ 1.47
Discontinued operations:			
Basic earnings (loss) per share	\$ —	\$ (0.01)	\$ 0.22
Diluted earnings (loss) per share	\$ —	\$ (0.01)	\$ 0.22
Net income:			
Basic earnings per share	\$ 3.53	\$ 3.52	\$ 1.70
Diluted earnings per share	\$ 3.51	\$ 3.50	\$ 1.69

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

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

	<u>Years Ended December 31,</u>		
	<u>2021</u>	<u>2020</u>	<u>2019</u>
Net income	\$ 134,780	\$ 134,730	\$ 64,975
Other comprehensive income (loss), net of income taxes			
Foreign currency translation	(12,262)	13,095	(2,523)
Change in fair value of cash flow hedges	4,246	(2,139)	—
Minimum benefit retirement liability	9,405	(7,664)	75
Comprehensive income	<u>136,169</u>	<u>138,022</u>	<u>62,527</u>
Comprehensive income attributable to noncontrolling interest	44	55	34
Comprehensive income attributable to Advanced Energy Industries, Inc.	<u>\$ 136,125</u>	<u>\$ 137,967</u>	<u>\$ 62,493</u>

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

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

Advanced Energy Industries, Inc. Stockholders' Equity

	<u>Common Stock</u>		<u>Additional Paid-in Capital</u>	<u>Accumulated Other Comprehensive Income</u>	<u>Retained Earnings</u>	<u>Non- controlling Interest</u>	<u>Total Stockholders' Equity</u>
	<u>Shares</u>	<u>Amount</u>					
Balances, December 31, 2018	38,164	\$ 38	\$ 97,418	\$ (3,449)	\$ 512,783	\$ 512	\$ 607,302
Stock issued from equity plans	194	—	104	—	—	—	104
Stock-based compensation	—	—	7,327	—	—	—	7,327
Other comprehensive income (loss)	—	—	—	(2,448)	—	—	(2,448)
Net income	—	—	—	—	64,941	34	64,975
Balances, December 31, 2019	38,358	38	104,849	(5,897)	577,724	546	677,260
Adoption of new accounting standards	—	—	—	—	(102)	—	(102)
Stock issued from equity plans	179	—	(482)	—	—	—	(482)
Stock-based compensation	—	—	12,272	—	—	—	12,272
Share repurchase	(244)	—	(11,630)	—	—	—	(11,630)
Other comprehensive income	—	—	—	3,292	—	—	3,292
Net income	—	—	—	—	134,675	55	134,730
Balances, December 31, 2020	38,293	38	105,009	(2,605)	712,297	601	815,340
Stock issued from equity plans	197	—	(1,931)	—	—	—	(1,931)
Stock-based compensation	—	—	15,428	—	—	—	15,428
Share repurchase	(901)	—	(2,800)	—	(75,325)	—	(78,125)
Dividends declared (\$0.10 per share)	—	—	—	—	(15,385)	—	(15,385)
Other comprehensive income	—	—	—	1,389	—	—	1,389
Net income	—	—	—	—	134,736	44	134,780
Balances, December 31, 2021	37,589	\$ 38	\$ 115,706	\$ (1,216)	\$ 756,323	\$ 645	\$ 871,496

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

ADVANCED ENERGY INDUSTRIES, INC.
Consolidated Statements of Cash Flows
(In thousands)

	Years Ended December 31,		
	2021	2020	2019
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net income	\$ 134,780	\$ 134,730	\$ 64,975
Less: income (loss) from discontinued operations, net of income taxes	73	(421)	8,480
Income from continuing operations, net of income taxes	134,707	135,151	56,495
Adjustments to reconcile net income to net cash from operating activities:			
Depreciation and amortization	52,893	47,770	26,147
Stock-based compensation expense	15,739	12,272	7,327
Provision for deferred income taxes	1,326	(622)	1,015
(Gain) loss from discount on notes receivable	(638)	721	1,100
Gain on sale of central inverter service business	—	—	(14,795)
Loss on disposal of assets	1,496	1,296	700
Changes in operating assets and liabilities, net of assets acquired:			
Accounts and other receivable, net	5,271	15,412	(18,879)
Inventories	(115,737)	11,658	3,687
Other assets	(2,910)	1,750	23,544
Accounts payable	67,111	(48,163)	(16,094)
Other liabilities and accrued expenses	(4,414)	24,520	(12,486)
Income taxes	(13,930)	394	(9,862)
Net cash from operating activities from continuing operations	140,914	202,159	47,899
Net cash from operating activities from discontinued operations	(669)	(923)	493
Net cash from operating activities	140,245	201,236	48,392
CASH FLOWS FROM INVESTING ACTIVITIES:			
Net proceeds from sale of marketable securities	—	3	1,742
Receipt (issuance) of notes receivable	3,050	(1,000)	(4,300)
Proceeds from sale of assets	3,060	116	—
Purchases of property and equipment	(31,877)	(36,483)	(25,188)
Acquisitions, net of cash acquired	(21,535)	(5,476)	(366,101)
Net cash from investing activities	(47,302)	(42,840)	(393,847)
CASH FLOWS FROM FINANCING ACTIVITIES:			
Proceeds from long-term borrowings	85,000	—	347,486
Payment of debt-issuance costs	(1,350)	—	—
Payments on long-term borrowings	(13,750)	(17,500)	(8,750)
Dividend payments	(15,385)	—	—
Purchase and retirement of common stock	(78,125)	(11,630)	—
Net payments related to stock-based awards	(1,762)	(482)	104
Net cash from financing activities	(25,372)	(29,612)	338,840
EFFECT OF CURRENCY TRANSLATION ON CASH AND CASH EQUIVALENTS	(3,567)	5,143	(1,496)
NET CHANGE IN CASH AND CASH EQUIVALENTS	64,004	133,927	(8,111)
CASH AND CASH EQUIVALENTS, beginning of period	480,368	346,441	354,552
CASH AND CASH EQUIVALENTS, end of period	\$ 544,372	\$ 480,368	\$ 346,441
SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION:			
Cash paid for interest	\$ 4,040	\$ 5,278	\$ 3,479
Cash paid for income taxes	32,543	21,032	18,594
Cash received for refunds of income taxes	12,506	1,569	1,762

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

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(in thousands, except per share amounts)

NOTE 1. OPERATIONS AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND ESTIMATES

Advanced Energy Industries, Inc., a Delaware corporation, and its wholly-owned subsidiaries ("we," "us," "our," "Advanced Energy," or the "Company") design, manufacture, sell, and support precision power products that transform, refine, and modify the raw electrical power coming from either the utility or the building facility and convert it into various types of highly controllable, usable power that is predictable, repeatable, and customizable to meet the necessary requirements for powering a wide range of complex equipment. Our power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition, high and low voltage applications such as semiconductor process control, data center computing, networking, telecommunication, medical equipment, life science applications, industrial technology and production, scientific instruments, clean technology production, advanced material production and temperature-critical thermal applications. We also supply related sensing, controls, and instrumentation products for advanced measurement and calibration of radio frequency ("RF") power and temperature, and electrostatic instrumentation products for test and measurement applications. Our network of global service support centers provides a recurring revenue opportunity as we offer repair services, conversions, upgrades, refurbishments, and used equipment to companies using our products.

In September 2019, we acquired the Artesyn Embedded Power business ("Artesyn"), which added new power products and technologies used in networking and computing, data center, including hyperscale, and industrial and medical applications. As of December 31, 2015, we discontinued our engineering, production, and sales of our inverter product line. As such, all inverter product revenues, costs, assets, and liabilities are reported in Discontinued Operations for all periods presented herein. See *Note 4. Disposed and Discontinued Operations* for more information. Ongoing inverter repair and service operations are reported as part of our continuing operations.

Principles of Consolidation — Our consolidated financial statements include our accounts and the accounts of our wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated. Our consolidated financial statements are stated in United States ("U.S.") Dollars and have been prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP").

Use of Estimates in the Preparation of the Consolidated Financial Statements — The preparation of our consolidated financial statements in conformity with U.S. GAAP requires us to make estimates, assumptions, and judgments that affect the reported amounts of assets and liabilities, the disclosure of contingent liabilities at the date of the financial statements, and the reported amounts of revenue and expenses during the reporting period. The significant estimates, assumptions, and judgments include, but are not limited to:

- excess and obsolete inventory;
- acquisitions and asset valuations, and
- pension obligations;
- taxes and other provisions.

Foreign Currency Translation — The functional currency of certain of our foreign subsidiaries is the local currency. Assets and liabilities of these foreign subsidiaries are translated to the United States Dollar at prevailing exchange rates on the balance sheet date. Revenues and expenses are translated at the average exchange rates in effect for each period. Translation adjustments resulting from this process are reported as a separate component of Other Comprehensive Income.

For certain other subsidiaries, the functional currency is the U.S. Dollar. Foreign currency transactions are recorded based on exchange rates at the time such transactions arise. Subsequent changes in exchange rates for foreign currency denominated monetary assets and liabilities result in foreign currency transaction gains and losses, which are reflected as unrealized (based on period end remeasurement) or realized (upon settlement of the transactions) in Other income (expense), net in our Consolidated Statements of Operations.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Derivatives — We use derivative financial instruments to manage risks associated with foreign currency and interest rate fluctuations. Unless we meet specific hedge accounting criteria, changes in the fair value of derivative financial instruments are recognized in the Consolidated Statements of Operations within Other income (expense), net.

For derivatives designated as cash flow hedges, changes in fair value are recorded to Accumulated other comprehensive loss on the Consolidated Balance Sheets and are reclassified to earnings when the underlying forecasted transaction affects earnings. We reassess the probability of the underlying forecasted transactions occurring on a quarterly basis.

Fair Value — We value our financial assets and liabilities using fair value measurements.

U.S. GAAP for fair value establishes a hierarchy that prioritizes fair value measurements based on the types of inputs used for the various valuation techniques (market approach, income approach, and cost approach). Our financial assets and liabilities are measured using inputs from the three levels of the fair value hierarchy. The three levels of the hierarchy and the related inputs are as follows:

- Level 1 — Quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access on the measurement date.
- Level 2 — Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.
- Level 3 — Unobservable inputs for the asset or liability.

We categorize fair value measurements within the fair value hierarchy based upon the lowest level of the most significant inputs used to determine fair value. Our assessment of the significance of a particular input to the fair value measurement requires judgment and may affect the valuation of the fair value of assets and liabilities and their placement within the fair value hierarchy levels.

The carrying amounts of our cash and cash equivalents, accounts receivable, accounts payable and other current assets and liabilities approximate fair value as recorded due to the short-term nature of these instruments.

Our non-financial assets, which primarily consist of property and equipment, goodwill, and other intangible assets, are not required to be carried at fair value on a recurring basis and are reported at carrying value. However, on a periodic basis or whenever events or changes in circumstances indicate that their carrying value may not be fully recoverable (and at least annually for goodwill), non-financial instruments are assessed for impairment and, if applicable, written down to and recorded at fair value. See *Note 12. Goodwill* and *Note 13. Intangible Assets* for further discussion and presentation of these amounts.

The fair value of borrowings approximates the recorded borrowing value based upon market interest rates for similar facilities. See *Note 21. Credit Facility* for additional information. The fair value of contingent consideration and other acquired assets and liabilities associated with our acquisitions are based on Level 3 inputs.

Cash, Cash Equivalents, and Marketable Securities — We consider all amounts on deposit with financial institutions and highly liquid investments with an original maturity of three months or less at the time of purchase to be cash equivalents. Cash and cash equivalents consist primarily of short-term money market instruments and demand deposits with insignificant interest rate risk.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

In some instances, we invest excess cash in money market funds not insured by the Federal Deposit Insurance Corporation. We believe the investments in money market funds are on deposit with credit-worthy financial institutions and the funds are highly liquid. These investments are reported at fair value and included in Cash and cash equivalents. We record interest income within Other income (expense), net in our Consolidated Statement of Operations.

We classify investments with stated maturities of greater than three months at time of purchase as marketable securities.

Concentrations of Credit Risk — Financial instruments which potentially subject us to credit risk include cash and cash equivalents, marketable securities, and trade accounts receivable. To preserve capital and maintain liquidity, we invest with financial institutions we deem to be of high quality and sound financial condition. Our investments are in low-risk instruments, and we limit our credit exposure in any one institution or type of investment instrument based upon criteria including creditworthiness.

We establish a reserve for credit losses based upon factors surrounding the credit risk of specific customers, historical trends, and other information.

Accounts Receivable and Reserve for Credit Losses — Accounts receivable are recorded at net realizable value. We maintain a credit approval process and we make significant judgments in connection with assessing our customers' ability to pay. 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. We do not require collateral from customers. Our principal customers are original equipment manufacturers ("OEM") and end user customers, which operate globally through wholly owned subsidiaries that purchase our products under substantially the same credit terms, with similar historical credit risks. As a result, we assess credit risks as a single group. We evaluate collection risk and establish expected credit loss primarily through a combination of the following: an assessment of customer credit risk ratings utilizing third party credit risk data, analysis of historical aging and credit loss experience, and customer specific information.

Inventories — Inventories are valued at the lower of cost (first-in, first-out method) or net realizable value and are presented net of reserves for excess and obsolete inventory. General market conditions, as well as our design activities, can cause certain products to become obsolete. We regularly review inventory quantity and write down excess and obsolete inventories based upon a regular analysis of inventory on hand compared to historical and projected end-user demands. The determination of projected end-user demand requires the use of estimates and assumptions related to projected unit sales for each product. Demand for our products can fluctuate significantly. A significant decrease in demand could result in an increase in the charges for excess inventory quantities on hand.

Property and Equipment — Property and equipment are stated at cost or estimated fair value if acquired in a business combination. Depreciation is computed over the estimated useful lives using the straight-line method. Additions and improvements are capitalized, while maintenance and repairs are expensed as incurred.

When depreciable assets are retired, or otherwise disposed of, the cost and related accumulated depreciation are removed from the accounts, and any related gains or losses are included in Other income (expense), net, in our Consolidated Statements of Operations.

Purchase accounting — Business combinations are accounted for using the purchase method of accounting. Under the purchase method, assets and liabilities, including intangible assets, are recorded at their fair values as of the acquisition date. Acquisition costs in excess of amounts assigned to assets acquired and liabilities assumed are recorded as goodwill. Transaction related costs associated with business combinations are expensed as incurred.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Leases — We lease manufacturing and office space under non-cancelable operating leases. Some of these leases contain provisions for landlord funded leasehold improvements, which we record as a reduction to right-of-use ("ROU") assets and the related operating lease liabilities. Our lease agreements generally contain lease and non-lease components, and we combine fixed payments for non-lease components with lease payments and account for them together as a single lease component. Certain lease agreements may contain variable payments, which are expensed as incurred and not included in the right-of-use lease assets and operating lease liabilities. When renewal options are reasonably certain of exercise, we include the renewal period in the lease term. In many cases, we have leases with a term of less than one year. We elected the practical expedient to exclude these short-term leases from our ROU assets and operating lease liabilities. On an ongoing basis, we negotiate and execute new leases to meet business objectives.

Right-of-use assets and operating lease liabilities are recognized at the present value of the future lease payments on the lease commencement date. The interest rate used to determine the present value of the future lease payments is our incremental borrowing rate because the interest rate implicit in our leases is not readily determinable. Our incremental borrowing rate is estimated to approximate the interest rate on a collateralized basis with similar terms and payments. We have a centrally managed treasury function; therefore, we apply a portfolio approach for determining the incremental borrowing rate applicable to the lease term. Operating lease expense is recognized on a straight-line basis over the lease term.

Intangible Assets, Goodwill, and Other Long-Lived Assets — As a result of our acquisitions, we identified and recorded intangible assets and goodwill. Intangible assets are valued based on estimates of future cash flows and amortized over their estimated useful lives. Goodwill is subject to annual impairment testing, as well as testing upon the occurrence of any event that indicates a potential impairment. Intangible assets and other long-lived assets are subject to an impairment test if there is an indicator of impairment. 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 and goodwill may be impaired and the resulting charge to operations may be material. 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.

The estimation of useful lives and expected cash flows requires us to make judgments regarding future periods that are subject to some factors outside of our control. Changes in these estimates can result in revisions to our carrying value of these assets and may result in material charges to our results of operations.

We conduct an annual goodwill impairment analysis 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, 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.

Debt Issuance Costs — We incurred debt issuance costs in connection with our debt facilities. Amounts paid directly to lenders are classified as issuance costs. Commitment fees and other costs directly associated with obtaining credit facilities are classified as deferred financing costs, which are recorded in the Consolidated Balance Sheets and amortized over the term of the facility. We allocated deferred debt issuance costs incurred for the current credit facility between the revolver and term loan based on their relative borrowing capacity. Deferred debt issuance costs associated with the revolving credit facility are recorded within Deposits and other assets and those associated with the term loan are recorded as a reduction of the carrying value of the debt on the Consolidated Balance Sheets. We amortize the majority of deferred debt issuance costs to interest expense using the effective interest rate method. Deferred debt issuance costs on the Line of Credit are amortized on the straight line basis over the life of the debt agreement.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Amortization of debt issuance costs is reflected in Other income (expense), net on the Consolidated Statements of Operations. See *Note 21. Credit Facility* for additional details.

Revenue Recognition — We recognize substantially all revenue at a point in time when we satisfy our performance obligations. Typically, this occurs on shipment of goods or completion of service because, at that point, we transfer control to our customer. The transaction price is based upon the standalone selling price. In most transactions, we have no obligations to our customers after the date products are shipped, other than pursuant to warranty obligations. Revenue is recognized net of any taxes collected from customers, which are subsequently remitted to governmental authorities. Surcharges, cost recoveries, and shipping and handling fees billed to customers, if any, are recognized as revenue. The related cost for shipping and handling fees is recognized in cost of sales. We expense incremental costs of obtaining contracts when the amortization period of the costs is less than one year. These costs are included in Selling, general, and administrative expenses in our Consolidated Statements of Operations. Payment terms for customers extended credit are typically net 30 days.

We maintain a worldwide support organization in ten countries, including the U.S., the People's Republic of China ("PRC"), Japan, Korea, Taiwan, Germany, Ireland, Singapore, Israel, and Great Britain. Support services include warranty and non-warranty repair services, upgrades, and refurbishments on the products we sell. Repairs that are covered under our standard warranty do not generate revenue.

Research and Development Expenses — Costs incurred to advance, test, or otherwise modify our proprietary technology or develop new technologies are considered research and development costs and are expensed when incurred. These costs are primarily comprised of costs associated with the operation of our laboratories and research facilities, including internal labor, materials, and overhead.

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 for up to 20 years. The 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 4. Disposed and Discontinued Operations* for more information. See *Note 15. Warranties* 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, considering 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.

Stock-Based Compensation — Accounting for stock-based compensation requires the measurement and recognition of compensation expense for all stock-based awards made to employees and directors based on estimated fair values.

We estimate the fair value of restricted stock units ("RSUs") on the grant date. For RSUs that contain a time-based and/or performance-based vesting condition, we estimate fair value using the closing share price on the grant date. We record stock-based compensation expense for awards with time-based vesting conditions over the term of the award. For awards with a performance-based vesting condition, we record stock-based compensation expense (based on management's assessment of the probability of meeting the performance conditions) over the estimated period to achieve the performance conditions. Upon forfeiture or expiration of these awards, we reverse the stock-based compensation expense.

Certain RSUs vest based on a market condition. We estimate the fair value and probability of achievement for each tranche of these awards using a Monte Carlo simulation. Because the probability of achievement is a factor in the

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Monte Carlo simulation, we recognize stock-based compensation expense over each tranche's estimated achievement period even if some or all of the shares never vest.

We estimate the fair value of the purchase rights in our employee stock purchase plan using a Black-Scholes Merton option pricing model and recognize compensation expense over the term of the purchase right. For all stock awards, we estimate forfeitures at the grant date and revise those estimates in subsequent periods if actual forfeitures differ from our estimates.

Income Taxes — We follow the liability method of accounting for income taxes under which deferred tax assets and liabilities are recognized for future tax consequences. A deferred tax asset or liability is computed for both the expected future impact of differences between the financial statement and tax basis of assets and liabilities and for the expected future tax benefit to be derived from tax loss and tax credit carryforwards. Tax rate changes are reflected in the period such changes are enacted.

We assess the recoverability of our net deferred tax assets and the need for a valuation allowance on a quarterly basis. Our assessment includes several factors including historical results and taxable income projections for each jurisdiction. The ultimate realization of deferred income tax assets is dependent on the generation of taxable income in appropriate jurisdictions during the periods in which those temporary differences are deductible. We consider the scheduled reversal of deferred income tax liabilities, projected future taxable income, and tax planning strategies in determining the amount of the valuation allowance. Based on the level of historical taxable income and projections for future taxable income over the periods in which the deferred income tax assets are deductible, we determine if we will realize the benefits of these deductible differences.

Accounting for income taxes requires a two-step approach to recognize and measure uncertain tax positions. In general, we are subject to regular examination of our income tax returns by the Internal Revenue Service and other tax authorities. The first step is to evaluate the tax position for recognition by determining, if based on the technical merits, it is more likely than not that the position will be sustained upon audit, including resolutions of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount that is more than 50% likely of being realized upon ultimate settlement. We regularly assess the likelihood of favorable or unfavorable outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. This evaluation is based on factors including, but not limited to, changes in facts or circumstances, changes in tax law, effectively settled issues under audit, and new audit activity.

Under U.S. GAAP, an accounting policy election can be made to either recognize deferred taxes for temporary basis differences expected to reverse as global intangible low-tax income ("GILTI") in future years, or to provide for the tax expense related to GILTI in the year the tax is incurred as a period expense only. We have elected to account for GILTI in the year the tax is incurred.

Commitments and Contingencies — From time to time we are 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 in a particular period. An unfavorable decision, particularly 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. We accrue loss contingencies when it is probable that a loss has occurred or will occur, and the amount of the loss can be reasonably estimated. Our estimates of probability of losses are subjective, involve significant judgment and uncertainties, and are based on the best information we have at any given point in time. Resolution of these uncertainties in a manner inconsistent with our expectations could have a significant impact on our results of operations and financial condition.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NEW ACCOUNTING STANDARDS

New Accounting Standards

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, will not have a material impact on the consolidated financial statements upon adoption.

New Accounting Standards Adopted

In August 2018, the FASB issued ASU 2018-14, "Compensation—Retirement Benefits—Defined Benefit Plans—General (Subtopic 715-20)" ("ASU 2018-14"). ASU 2018-14 eliminates requirements for certain disclosures and requires additional disclosures under defined benefit pension plans and other post-retirement plans. ASU 2018-14 was effective for us on January 1, 2021. The impact of adoption was not material to our consolidated financial statements.

New Accounting Standards Issued But Not Yet Adopted

In March 2020, the FASB issued ASU 2020-04, "Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting" ("ASU 2020-04"). In January 2021, the FASB issued ASU 2021-01, "Reference Rate Reform (Topic 848): Scope" ("ASU 2021-01"). This collective guidance provides optional expedients and exceptions for applying GAAP to contract modifications and hedging relationships, subject to meeting certain criteria, that reference LIBOR or another reference rate that is expected to be discontinued. ASU 2020-04 and ASU 2021-01 will be in effect through December 31, 2022.

Our Credit Facility (refer to *Note 21. Credit Facility*) and interest rate swap agreements (refer to *Note 8. Derivative Financial Instruments*) reference the one-month USD LIBOR rate. Both agreements contain provisions for transition to a new reference rate upon discontinuance of LIBOR. We expect the one-month USD LIBOR rate to be available through June 2023. We are currently assessing the potential timing of transitioning to a replacement interest rate benchmark for our Credit Facility (See *Note 21. Credit Facility*) and do not expect ASU 2020-04 and ASU 2020-01 to materially impact our consolidated financial statements.

In October 2021, the FASB issued ASU 2021-08, "Business Combinations (Topic 806) Accounting for Contract Assets and Contract Liabilities from Contracts with Customers." The amendments in ASU 2021-08 will improve the accounting for acquired revenue contracts with customers in a business combination. This pronouncement will be effective for us on January 1, 2023. We are still evaluating the impact, if any, that the adoption of ASU 2021-08 may have on our consolidated financial statements.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 2. ACQUISITIONS

Intangible Assets Acquired

In January 2021, we acquired certain intangible assets related to the manufacturing of fiber optic sensing equipment. As of December 31, 2021, we paid \$6.1 million in cash and expect to pay an additional \$0.4 million within one year of the closing. These intangible assets have an estimated useful life of five years. See *Note 13. Intangible Assets* for additional details.

TEGAM, Inc.

On June 1, 2021, we acquired 100% of the issued and outstanding shares of capital stock of TEGAM, Inc., which is based in Geneva, Ohio. This acquisition added metrology and calibration instrumentation to Advanced Energy’s RF process power solutions in our Semiconductor and Industrial and Medical markets.

The components of the fair value of the total consideration transferred were as follows:

Cash paid for acquisition	\$ 15,430
Holdback	1,800
Total fair value of consideration transferred	<u>17,230</u>
Less cash acquired	(177)
Total purchase price	<u>\$ 17,053</u>

The following table summarizes the preliminary values of the assets acquired and liabilities assumed:

	Preliminary Fair Value
Current assets and liabilities, net	\$ 3,536
Property and equipment	734
Operating lease right-of-use assets	425
Intangible assets	6,900
Goodwill (deductible for tax purposes)	5,877
Other non-current assets	31
Total assets acquired	<u>17,503</u>
Other non-current liabilities	25
Operating lease liability	425
Total liabilities assumed	<u>450</u>
Total fair value of net assets acquired	<u>\$ 17,053</u>

A summary of the intangible assets acquired, amortization method, and estimated useful lives follows:

		Amortization Method	Useful Life
Technology	\$ 1,100	Straight-line	5
Customer relationships	5,500	Straight-line	15
Tradename	300	Straight-line	5
Total	<u>\$ 6,900</u>		

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Versatile Power, Inc

On December 31, 2020, we acquired 100% of the issued and outstanding shares of Versatile Power, Inc., which is based in Campbell, California. This acquisition added radio frequency ("RF") and programmable power supplies for medical and industrial applications to our product portfolio and further expands our presence in the medical market by adding proven technologies, deep customer relationships, expertise in medical design, and a medical-certified manufacturing center.

The components of the fair value of the total consideration transferred were as follows:

Cash paid for acquisition	\$	4,654
Holdback		950
Total fair value of consideration transferred		5,604
Less cash acquired		(245)
Total purchase price	\$	<u>5,359</u>

The following table summarizes the final values of the assets acquired and liabilities assumed:

	<u>Fair Value</u>
Current assets and liabilities, net	\$ 1,021
Property and equipment	35
Operating lease right-of-use assets	463
Intangible assets	4,000
Goodwill (deductible for tax purposes)	323
Total assets acquired	5,842
Other non-current liabilities	20
Operating lease liability	463
Total liabilities assumed	483
Total fair value of net assets acquired	\$ <u>5,359</u>

A summary of the intangible assets acquired, amortization method, and estimated useful lives follows:

		<u>Amortization</u>	<u>Useful Life</u>
		<u>Method</u>	
Technology	\$ 400	Straight-line	5
Customer relationships	3,600	Straight-line	15
Total	<u>\$ 4,000</u>		

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 3. REVENUE

Nature of goods and services

Products

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, refine, and modify the raw electrical power coming from either the utility or the building facility and convert it into various types of highly controllable, usable power that is predictable, repeatable, and customizable to meet the necessary requirements for powering a wide range of complex equipment.

Our power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition, high and low voltage applications such as process control, data center computing, networking, telecommunication, medical equipment, life science applications, industrial technology and production, scientific instruments, clean technology production, advanced material production and temperature-critical thermal applications such as material and chemical processing. We also supply related sensing, controls, and instrumentation products for advanced measurement and calibration of radio RF power and temperature, electrostatic instrumentation products for test and measurement applications, and gas sensing and monitoring solutions for multiple industrial markets. Our network of global service support centers provides a recurring revenue opportunity as we offer repair services, conversions, upgrades, refurbishments, and used equipment to companies using our products.

Services

Our services group offers warranty and after-market 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 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 in the U.S., the PRC, Japan, Korea, Taiwan, Germany, Ireland, Singapore, Israel, and Great Britain. Support services include warranty and non-warranty repair services, upgrades, and refurbishments on the products we sell.

As part of our ongoing service business, we satisfy our service obligations under preventative maintenance contracts and extended warranties which had previously been offered on our discontinued inverter products. Any up-front fees received for extended warranties or maintenance plans are deferred. Revenue under these arrangements is recognized ratably over the underlying terms as we do not have historical information which would allow us to project the estimated service usage pattern at this time.

The following table summarizes deferred revenue, which relates to extended warranties and service contracts. We expect to recognize this revenue ratably through the year 2031.

	December 31, 2021	December 31, 2020
Deferred revenue	\$ 7,067	\$ 8,671

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Disaggregation of Revenue

The following tables present additional information regarding our revenue:

	Years Ended December 31,		
	2021	2020	2019
Semiconductor Equipment	\$ 710,174	\$ 611,864	\$ 403,018
Industrial and Medical	341,176	313,646	245,992
Data Center Computing	270,924	322,539	91,438
Telecom and Networking	133,680	167,777	48,500
Total	\$ 1,455,954	\$ 1,415,826	\$ 788,948

	Years Ended December 31,					
	2021		2020		2019	
United States	\$ 561,312	38.5 %	\$ 530,965	37.5 %	\$ 321,869	40.8 %
North America (excluding U.S.)	104,167	7.2	156,856	11.1	51,765	6.6
Asia	597,830	41.1	606,893	42.9	295,155	37.4
Europe	179,056	12.3	117,989	8.3	119,427	15.1
Other	13,589	0.9	3,123	0.2	732	0.1
Total	\$ 1,455,954	100.0 %	\$ 1,415,826	100.0 %	\$ 788,948	100.0 %

	Years Ended December 31,		
	2021	2020	2019
Product	\$ 1,318,213	\$ 1,296,867	\$ 678,061
Services	137,741	118,959	110,887
Total	\$ 1,455,954	\$ 1,415,826	\$ 788,948

NOTE 4. DISPOSED AND DISCONTINUED OPERATIONS

Disposed Operations

In May 2019, we sold our grid-tied central solar inverter services business to Bold Renewables Holdings, LLC ("Bold") for \$1.00 dollar and Bold's assumption of certain product warranty obligations. In connection with this transaction, we entered into a Loan and Security Agreement whereby we loaned Bold an aggregate \$5.3 million between May 2019 and the first quarter of 2020. During the year ended December 31, 2021, Bold repaid the amount borrowed at a discounted amount in accordance with the terms of the agreement. The loan is now fully repaid, and the Loan and Security Agreement has been cancelled.

As a result of the transaction, during the year ended December 31, 2019, we reduced our discontinued operations liabilities by approximately \$10.9 million that were related to initial product warranty and reduced our other liabilities by approximately \$22.0 million that were related to extended warranty service obligations as well as reduced other assets and liabilities associated with the continuing grid-tied central solar inverter service and repair business. Accordingly, we recognized a \$14.8 million non-cash gain in Other income (expense) from continuing operations and an \$8.6 million non-cash gain, net of tax expense of \$2.4 million, in Income (loss) from discontinued operations.

Discontinued Operations

In December 2015, we completed the wind down of engineering, manufacturing, and sales of our solar inverter product line. Accordingly, the results of our inverter business are reflected as Income (loss) from discontinued operations, net of income taxes on our Consolidated Statements of Operations.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

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. We no longer offer extended warranties related to the inverter product line.

NOTE 5. INCOME TAXES

The geographic distribution of pretax income from continuing operations was as follows:

	Years Ended December 31,		
	2021	2020	2019
Domestic	\$ 24,541	\$ 17,526	\$ (20,597)
Foreign	124,170	140,621	87,791
	<u>\$ 148,711</u>	<u>\$ 158,147</u>	<u>\$ 67,194</u>

The provision for income taxes from continuing operations is summarized as follows:

	Years Ended December 31,		
	2021	2020	2019
Current:			
Federal	\$ (2,468)	\$ 5,475	\$ (9,627)
State	929	1,927	882
Foreign	14,217	16,216	18,429
Total current provision	<u>12,678</u>	<u>23,618</u>	<u>9,684</u>
Deferred:			
Federal	762	(312)	3,822
State	(200)	1,270	(178)
Foreign	764	(1,580)	(2,629)
Total deferred provision (benefit)	<u>1,326</u>	<u>(622)</u>	<u>1,015</u>
Total provision for income taxes	<u>\$ 14,004</u>	<u>\$ 22,996</u>	<u>\$ 10,699</u>

Our effective tax rates differ from the U.S. federal statutory rate of 21% for the years ended December 31, 2021, 2020, and 2019 primarily due to the benefit of earnings in foreign jurisdictions which are subject to lower tax rates as well as reductions in uncertain tax positions and tax credits, offset by net U.S. tax on foreign operations, withholding taxes, and audit settlements.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

The principal causes of the difference between the federal statutory rate and the effective income tax rate for each of the years below are as follows:

	Years Ended December 31,		
	2021	2020	2019
Income taxes per federal statutory rate	\$ 31,229	\$ 33,211	\$ 14,111
State income taxes, net of federal deduction	534	2,793	10
U.S. tax on foreign operations	5,786	9,666	5,805
Foreign derived intangible income deduction	(3,927)	(4,070)	—
Tax effect of foreign operations	(11,520)	(20,527)	(13,086)
Uncertain tax positions	(6,899)	(3,215)	(4,487)
Audit settlements	7,764	—	—
Unremitted earnings	261	(567)	1,624
Tax credits	(6,149)	(2,292)	(2,088)
Change in valuation allowance	(73)	(1,175)	7,222
Withholding taxes	756	4,265	6,500
Executive compensation limitation	1,926	1,070	356
Other permanent items, net	(5,684)	3,837	(5,268)
Total provision for income taxes	<u>\$ 14,004</u>	<u>\$ 22,996</u>	<u>\$ 10,699</u>

Deferred tax assets and liabilities are recognized for the future tax consequences of differences between the carrying amounts of assets and liabilities and their respective tax bases using enacted tax rates in effect for the year in which the differences are expected to be reversed. Significant deferred tax assets and liabilities consist of the following:

	Years Ended December 31,	
	2021	2020
Deferred tax assets		
Stock-based compensation	\$ 2,528	\$ 2,130
Net operating loss and tax credit carryforwards	54,210	57,590
Interest expense limitation	7,344	7,344
Pension obligation	10,778	14,297
Excess and obsolete inventory	3,325	3,722
Accrued restructuring	2,223	2,468
Deferred revenue	4,195	3,048
Employee bonuses and commissions	3,861	5,388
Amortization	26,358	28,786
Operating lease liabilities	19,405	20,267
Other	8,017	8,925
Deferred tax assets	<u>142,244</u>	<u>153,965</u>
Less: Valuation allowance	<u>(42,051)</u>	<u>(46,702)</u>
Net deferred tax assets	<u>100,193</u>	<u>107,263</u>
Deferred tax liabilities		
Depreciation and amortization	37,515	40,266
Unremitted earnings	4,435	4,173
Operating lease right-of-use assets	17,558	18,731
Other	3,364	3,380
Deferred tax liabilities	<u>62,872</u>	<u>66,550</u>
Net deferred tax assets	<u>\$ 37,321</u>	<u>\$ 40,713</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
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Of the \$37.3 million and \$40.7 million net deferred tax asset on December 31, 2021 and 2020, respectively, \$47.2 million and \$50.8 million is reflected as a net non-current deferred tax asset and \$9.9 million and \$10.1 million is reflected as a long-term liability on December 31, 2021 and 2020, respectively.

As of December 31, 2021, we have recorded a valuation allowance on \$4.0 million of our U.S. domestic deferred tax assets, largely attributable to state carryforward attributes that are expected to expire before sufficient income can be realized in those jurisdictions. The remaining valuation allowance on deferred tax assets approximates \$38.0 million and is associated primarily with operations in Germany, Hong Kong, and Switzerland. As of December 31, 2021, there is not sufficient positive evidence to conclude that such deferred tax assets, presently reduced by a valuation allowance, will be recognized. The December 31, 2021 valuation allowance balance reflects a decrease of \$4.7 million during the year. The change in the valuation allowance is primarily due to decreases from foreign exchange movements and current year activity.

As of December 31, 2021, we had U.S., foreign and state tax loss carryforwards of \$56.9 million, \$129.0 million, and \$117.1 million, respectively. Additionally, we had \$0.8 million and \$30.5 million of capital loss and interest expense limitation carryforwards, respectively. Finally, we had U.S. and state tax credit carryforwards of \$1.5 million and \$1.7 million, respectively. The U.S. and state net operating losses, tax credits, and interest expense limitation are subject to various utilization limitations under Section 382 of the Internal Revenue Code and applicable state laws. These Section 382 limited attributes have various expiration periods through 2036 or, in the case of the interest expense limitation amount, no expiration period. Much of the foreign jurisdiction, and \$8.0 million of the federal net operating loss carry forwards, have no expiration period.

We operate under a tax holiday in Singapore and China. These tax holidays are in effect through June 30, 2027 and December 31, 2022, respectively. The tax holiday is conditional upon our meeting certain employment and investment thresholds. The impact of the tax holidays decreased foreign taxes by \$13.3 million and \$13.0 million for 2021 and 2020, respectively. The benefit of the tax holiday on earnings per diluted share was \$0.35 and \$0.34 for 2021 and 2020, respectively.

As of December 31, 2021, we have undistributed earnings of certain foreign subsidiaries of approximately \$32.4 million that we have indefinitely invested, and on which we have not recognized deferred taxes. Estimating the amount of potential tax is not practicable because of the complexity and variety of assumptions necessary to compute the tax.

We account for uncertain tax positions by applying a minimum recognition threshold to tax positions before recognizing these positions in the financial statements. The reconciliation of our total gross unrecognized tax benefits is as follows:

	Years Ended December 31,		
	2021	2020	2019
Balance at beginning of period	\$ 9,673	\$ 13,009	\$ 13,162
Additions based on tax positions taken during a prior period	963	219	484
Additions based on tax positions taken during a prior period - acquisitions	—	—	4,479
Additions based on tax positions taken during the current period	566	—	—
Reductions based on tax positions taken during a prior period	—	—	(4,295)
Reductions related to a lapse of applicable statute of limitations	(4,575)	(3,555)	(821)
Reductions related to a settlement with taxing authorities	(1,114)	—	—
Balance at end of period	<u>\$ 5,513</u>	<u>\$ 9,673</u>	<u>\$ 13,009</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
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The unrecognized tax benefits of \$5.5 million, if recognized, will impact our effective tax rate. In accordance with our accounting policy, we recognize accrued interest and penalties related to unrecognized tax benefits as a component of tax expense. We had \$0.4 million and \$3.2 million of accrued interest and penalties on December 31, 2021 and 2020, respectively. With few exceptions, we are no longer subject to federal, state, or foreign income tax examinations by tax authorities for years before 2018.

NOTE 6. EARNINGS PER SHARE

We compute basic earnings per share ("EPS") by dividing income available to common stockholders by the weighted-average number of common shares outstanding during the period. The diluted EPS computation is similar to basic EPS except we increase the denominator to include the number of additional common shares that would have been outstanding (using the if-converted and treasury stock methods) if our outstanding stock options and restricted stock units had been converted to common shares (when such conversion is dilutive).

The following is a reconciliation of the weighted-average shares outstanding used in the calculation of basic and diluted earnings per share:

	<u>Years Ended December 31,</u>		
	<u>2021</u>	<u>2020</u>	<u>2019</u>
Income from continuing operations	\$ 134,707	\$ 135,151	\$ 56,495
Less: income from continuing operations attributable to noncontrolling interest	44	55	34
Income from continuing operations attributable to Advanced Energy Industries, Inc.	<u>\$ 134,663</u>	<u>\$ 135,096</u>	<u>\$ 56,461</u>
Basic weighted-average common shares outstanding	38,143	38,314	38,281
Assumed exercise of dilutive stock options and restricted stock units	212	228	214
Diluted weighted-average common shares outstanding	<u>38,355</u>	<u>38,542</u>	<u>38,495</u>
Continuing operations:			
Basic earnings per share	\$ 3.53	\$ 3.53	\$ 1.47
Diluted earnings per share	\$ 3.51	\$ 3.51	\$ 1.47

Share Repurchase

To execute the repurchase of shares of our common stock, we periodically enter into stock repurchase agreements. The following table summarizes these repurchases:

<u>(in thousands, except per share amounts)</u>	<u>Years Ended December 31,</u>	
	<u>2021</u>	<u>2020</u>
Amount paid to repurchase shares	\$ 78,125	\$ 11,630
Number of shares repurchased	901	244
Average repurchase price per share	\$ 86.76	\$ 47.75
Remaining authorized by Board of Directors for future repurchases as of period end	\$ 128,377	\$ 38,369

There were no shares repurchased from related parties. Repurchased shares were retired and assumed the status of authorized and unissued shares. On July 29, 2021, the Board of Directors approved an increase to the share repurchase program, which authorized the Company to repurchase up to \$200 million in shares of our common stock with no time limitation.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 7. FAIR VALUE MEASUREMENTS

The following tables present information about our assets and liabilities measured at fair value on a recurring basis.

Description	Balance Sheet Classification	December 31, 2021			Total Fair Value
		Level 1	Level 2	Level 3	
Assets:					
Certificates of deposit	Marketable securities	\$ —	2,296	—	\$ 2,296
Interest rate swaps	Deposits and other assets	—	2,739	—	2,739
Total assets measured at fair value on a recurring basis		<u>\$ —</u>	<u>\$ 5,035</u>	<u>\$ —</u>	<u>\$ 5,035</u>
Liabilities:					
Contingent consideration	Other current liabilities	\$ —	—	1,738	\$ 1,738
Total liabilities measured at fair value on a recurring basis		<u>\$ —</u>	<u>\$ —</u>	<u>\$ 1,738</u>	<u>\$ 1,738</u>
Description	Balance Sheet Classification	December 31, 2020			Total Fair Value
		Level 1	Level 2	Level 3	
Assets:					
Certificates of deposit	Marketable securities	\$ —	\$ 2,654	\$ —	\$ 2,654
Total assets measured at fair value on a recurring basis		<u>\$ —</u>	<u>\$ 2,654</u>	<u>\$ —</u>	<u>\$ 2,654</u>
Liabilities:					
Contingent consideration	Other current liabilities	\$ —	\$ —	\$ 2,009	\$ 2,009
Contingent consideration	Other long-term liabilities	—	—	2,940	2,940
Interest rate swaps	Other long-term liabilities	—	2,811	—	2,811
Total liabilities measured at fair value on a recurring basis		<u>\$ —</u>	<u>\$ 2,811</u>	<u>\$ 4,949</u>	<u>\$ 7,760</u>

The fair value of foreign currency forward contracts is based on the movement in the forward rates of foreign currency cash flows in which the hedging instrument is denominated. We determine the fair value of interest rate swaps by estimating the net present value of the expected cash flows based on market rates and associated yield curves, adjusted for non-performance credit risk, as applicable. See *Note 8. Derivative Financial Instruments* for additional information. The fair value of contingent consideration is determined by estimating the net present value of the expected cash flows based on the probability of expected payment. For all periods presented, there were no transfers into or out of Level 3.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 8. DERIVATIVE FINANCIAL INSTRUMENTS

Changes in foreign currency exchange rates impact us. We may manage these risks through the use of derivative financial instruments, primarily forward contracts with banks. These forward contracts manage the exchange rate risk associated with assets and liabilities denominated in nonfunctional currencies. These derivative instruments are typically executed for one-month periods and not designated as hedges; however, they do economically offset the fluctuations of our assets and liabilities due to foreign exchange rate changes.

Gains and losses related to foreign currency exchange contracts were offset by corresponding gains and losses on the revaluation of the underlying assets and liabilities. Both are included as a component of Other income (expense), net in our Consolidated Statements of Operations. As of December 31, 2021 and 2020, there were no foreign currency forward contracts outstanding.

In April 2020, we executed interest rate swap contracts with independent financial institutions to partially reduce the variability of cash flows in LIBOR indexed debt interest payments on our Term Loan Facility (under our existing Credit Agreement dated September 10, 2019, as amended). These transactions are accounted for as cash flow hedging instruments. The interest rate swap contracts fixed a portion of the outstanding principal balance on our term loan to a total interest rate of 1.271%. This is comprised of 0.521% average fixed rate per annum in exchange for a variable interest rate based on one-month USD-LIBOR-BBA plus the credit spread in our existing Credit Agreement, which is 75 basis points at current leverage ratios.

The following table summarizes the notional amount of our qualified hedging instruments:

	December 31, 2021	December 31, 2020
Interest rate swap contracts	\$ 255,719	\$ 273,219

The following table summarizes the amounts recorded in Accumulated other comprehensive loss on the Consolidated Balance Sheets for qualifying hedges.

	December 31, 2021	December 31, 2020
Interest rate swap contracts - gains (losses)	\$ 2,107	\$ (2,139)

See *Note 7. Fair Value Measurements* for information regarding fair value of derivative instruments.

As a result of using derivative financial instruments, we are exposed to the risk that counterparties to contracts could fail to meet their contractual obligations. We manage this risk by reviewing counterparty creditworthiness on a regular basis and limiting exposure to any single counterparty.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 9. ACCOUNTS AND OTHER RECEIVABLE, NET

We record accounts and other receivable at net realizable value. Components of accounts and other receivable, net of reserves, were as follows:

	<u>December 31, 2021</u>	<u>December 31, 2020</u>
Amounts billed, net	\$ 217,549	\$ 213,560
Unbilled receivables	19,678	21,618
Total receivables, net	<u>\$ 237,227</u>	<u>\$ 235,178</u>

"Amounts billed, net" represents amounts invoiced to customers in accordance with our terms and conditions and reflects an allowance for expected credit losses. These receivables are short term in nature and do not include any financing components.

"Unbilled receivables" consist of amounts where we satisfied our contractual obligations associated with customer inventory stocking agreements. Such amounts typically become billable upon the customer's consumption of the inventory. We anticipate invoicing and collecting substantially all unbilled receivables within the next twelve months.

The following table summarizes the changes in expected credit losses:

	<u>December 31, 2021</u>	<u>December 31, 2020</u>
Balance at beginning of period	\$ 7,602	\$ 7,745
Additions	135	368
Deductions - write-offs, net of recoveries	(687)	(511)
Foreign currency translation	(18)	—
Other	(1,248)	—
Balance at end of period	<u>\$ 5,784</u>	<u>\$ 7,602</u>

NOTE 10. INVENTORIES

We value inventories at the lower of cost or net realizable value and computed on a first-in, first-out basis. Components of inventories were as follows:

	<u>December 31, 2021</u>	<u>December 31, 2020</u>
Parts and raw materials	\$ 261,365	\$ 141,337
Work in process	24,222	13,702
Finished goods	52,823	66,307
Total	<u>\$ 338,410</u>	<u>\$ 221,346</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 11. PROPERTY AND EQUIPMENT, NET

Property and equipment, net is comprised of the following:

	Estimated Useful Life (in years)	December 31, 2021	December 31, 2020
Buildings	25	\$ 1,625	\$ 1,776
Machinery and equipment	5 to 8	133,010	115,404
Computer equipment, furniture, fixtures, and vehicles	3 to 5	33,490	31,237
Leasehold improvements	2 to 10	48,370	42,984
Construction in process		5,914	3,693
		222,409	195,094
Less: Accumulated depreciation		(107,579)	(80,363)
Property and equipment, net		<u>\$ 114,830</u>	<u>\$ 114,731</u>

The following table summarizes depreciation expense. All depreciation expense is recorded in income from continuing operations.

	Years Ended December 31,		
	2021	2020	2019
Depreciation expense	\$ 30,833	\$ 27,641	\$ 13,979

NOTE 12. GOODWILL

The following table summarizes the changes in goodwill:

	December 31, 2021	December 31, 2020
Balance at beginning of period	\$ 209,983	\$ 202,932
Measurement period adjustments to purchase price allocations	(1,426)	1,957
Additions from acquisition	5,877	1,749
Foreign currency translation	(2,244)	3,345
Balance at end of period	<u>\$ 212,190</u>	<u>\$ 209,983</u>

Additions and adjustments are the result of business combinations. Refer to *Note 2. Acquisitions*.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 13. INTANGIBLE ASSETS

Intangible assets consisted of the following:

	December 31, 2021		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Technology	\$ 91,461	\$ (35,854)	\$ 55,607
Customer relationships	118,706	(34,187)	84,519
Trademarks and other	27,244	(7,964)	19,280
Total	\$ 237,411	\$ (78,005)	\$ 159,406

	December 31, 2020		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Technology	\$ 85,075	\$ (24,999)	\$ 60,076
Customer relationships	114,171	(26,880)	87,291
Trademarks and other	27,021	(5,449)	21,572
Total	\$ 226,267	\$ (57,328)	\$ 168,939

At December 31, 2021, the weighted average remaining useful life of intangibles subject to amortization was approximately 9.8 years.

Amortization expense related to intangible assets was as follows:

	Years Ended December 31,		
	2021	2020	2019
Amortization expense	\$ 22,060	\$ 20,129	\$ 12,168

Estimated amortization expense related to intangibles is as follows:

Year Ending December 31,	
2022	22,025
2023	22,007
2024	19,148
2025	14,653
2026	12,937
Thereafter	68,636
Total	\$ 159,406

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 14. RESTRUCTURING COSTS

During 2018, we committed to a restructuring plan to optimize our manufacturing footprint and to improve our operating efficiencies and synergies related to our recent acquisitions. For the periods presented, we incurred severance costs primarily related to the transition and exit of our facility in Shenzhen, PRC and actions associated with synergies related to the Artesyn acquisition. The table below summarizes restructuring charges:

	Years Ended December 31,		
	2021	2020	2019
Severance and related charges	\$ 3,467	\$ 9,632	\$ 3,042
Facility relocation and closure charges	1,285	3,534	1,996
Total restructuring charges	\$ 4,752	\$ 13,166	\$ 5,038
			Cumulative Cost Through December 31, 2021
Severance and related charges			\$ 20,380
Facility relocation and closure charges			6,815
Total restructuring charges			\$ 27,195

Our restructuring liabilities are included in other accrued expenses in our Consolidated Balance Sheets and related primarily to severance and associated costs. Changes in restructuring liabilities were as follows:

	December 31, 2021	December 31, 2020
Balance at beginning of period	\$ 10,641	\$ 2,172
Costs incurred and charged to expense	4,752	13,166
Costs paid or otherwise settled	(6,127)	(4,714)
Effects of changes in exchange rate	(3)	17
Balance at end of period	\$ 9,263	\$ 10,641

NOTE 15. WARRANTIES

Our sales agreements include customary product warranty provisions, which range from 12 to 24 months after shipment. We record the estimated warranty obligations cost when we recognize revenue. This estimate is based on historical experience by product and configuration.

Our estimated warranty obligation is included in other accrued expenses in our Consolidated Balance Sheets. Changes in our product warranty obligation were as follows:

	Years Ended December 31,	
	2021	2020
Balance at beginning of period	\$ 4,780	\$ 6,413
Warranty acquired in business combinations	—	15
Increases to accruals	3,165	2,996
Warranty expenditures	(4,587)	(4,688)
Effect of changes in exchange rates	(8)	44
Balance at end of period	\$ 3,350	\$ 4,780

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 16. LEASES

Components of operating lease cost were as follows:

	Years Ended December 31,		
	2021	2020	2019
Operating lease cost	\$ 23,443	\$ 22,920	\$ 11,052
Short-term and variable lease cost	2,555	1,895	4,726
Total operating lease cost	<u>\$ 25,998</u>	<u>\$ 24,815</u>	<u>\$ 15,778</u>

Maturities of our operating lease liabilities are as follows:

Year Ending December 31,	
2022	\$ 20,416
2023	17,230
2024	14,812
2025	12,426
2026	11,079
Thereafter	65,785
Total lease payments	141,748
Less: Interest	(30,725)
Present value of lease liabilities	<u>\$ 111,023</u>

We have lease agreements that commence in the future between 2022 and 2023 with total payments of \$4.3 million through 2029.

	Year Ended December 31,	
	2021	2020
Weighted average remaining lease term (in years)	9.81	10.65
Weighted average discount rate	4.51 %	4.63 %

	Year Ended December 31,		
	2021	2020	2019
Cash paid for operating leases	\$ 23,668	\$ 21,877	\$ 12,101
Right-of-use assets obtained in exchange for operating lease liabilities	\$ 16,399	\$ 33,741	\$ 84,551

NOTE 17. EMPLOYEE RETIREMENT PLANS AND POSTRETIREMENT BENEFITS

Defined Contribution Plans

We have a 401(k) profit-sharing and retirement savings plan covering substantially all full-time U.S. employees. Participants may defer up to the maximum amount allowed permitted by law. Effective January 1, 2022, participants are immediately vested in both their own contributions and profit-sharing contributions. Profit-sharing contributions, which are discretionary, are approved by the Board of Directors. For the years ended December 31, 2021, 2020, and 2019 we based our profit-sharing contribution on matching 50% of employee contributions up to 6% of the employee's compensation.

During the years ended December 31, 2021, 2020, and 2019 we recognized total defined contribution plan costs of \$3.1 million, \$2.6 million, and \$1.6 million, respectively.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
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Defined Benefit Plan

We maintain defined benefit pension plans for certain of our non-U.S. employees in the U.K., Germany, and Philippines. Each plan is managed locally and in accordance with respective local laws and regulations.

To measure the expense and related benefit obligation, we make various assumptions, including discount rates used to value the obligation, expected return on plan assets used to fund these expenses, and estimated future inflation rates. We base these assumptions on historical experience as well as facts and circumstances. We use an actuarial analysis to measure the expense and liability associated with pension benefits.

The information provided below includes one pension plan which is part of discontinued operations. As such, for all periods presented, all related expenses are reported in discontinued operations in the Consolidated Statements of Operations.

Our projected benefit obligation and plan assets for defined benefit pension plans and the related assumptions used to determine the related liabilities are as follows:

	Years Ended December 31,	
	2021	2020
Projected benefit obligation, beginning of year	\$ 97,740	\$ 83,262
Service cost	1,282	1,068
Interest cost	1,452	1,716
Actuarial (gain) loss	(8,682)	7,591
Benefits paid	(2,010)	(1,199)
Translation adjustment	(4,006)	5,302
Projected benefit obligation, end of year	<u>\$ 85,776</u>	<u>\$ 97,740</u>
Fair value of plan assets, beginning of year	\$ 17,293	\$ 14,903
Actual return on plan assets	641	682
Contributions	1,775	1,827
Benefits paid	(1,112)	(993)
Actuarial gain	71	180
Translation adjustment	(147)	694
Fair value of plan assets, end of year	<u>\$ 18,521</u>	<u>\$ 17,293</u>
Funded status of plan	<u>\$ (67,255)</u>	<u>\$ (80,447)</u>

The components of net periodic pension benefit cost recognized in our Consolidated Statements of Operations for the periods presented are as follows:

	Years Ended December 31,		
	2021	2020	2019
Service cost	\$ 1,282	\$ 1,068	\$ 272
Interest cost	1,452	1,716	1,211
Expected return on plan assets	(642)	(683)	(615)
Amortization of actuarial gains and losses	820	459	411
Net periodic pension cost	<u>\$ 2,912</u>	<u>\$ 2,560</u>	<u>\$ 1,279</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Assumptions used in the determination of the net periodic pension cost are:

	Years Ended December 31,		
	2021	2020	2019
Discount rate	1.6 %	1.8 %	2.7 %
Expected long-term return on plan assets	3.2 %	3.7 %	4.6 %

The fair value of our qualified pension plan assets by category was as follows:

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
Diversified Growth Fund	\$ —	\$ 12,249	\$ —	\$ 12,249
Corporate Bonds	—	4,640	—	4,640
Insurance Contracts	—	—	984	984
Cash	648	—	—	648
Total	\$ 648	\$ 16,889	\$ 984	\$ 18,521

	December 31, 2020			
	Level 1	Level 2	Level 3	Total
Multi-Asset Fund	\$ —	\$ 5,149	\$ —	\$ 5,149
Diversified Growth Fund	—	5,134	—	5,134
Corporate Bonds	—	4,906	—	4,906
Insurance Contracts	—	—	1,109	1,109
Cash	995	—	—	995
Total	\$ 995	\$ 15,189	\$ 1,109	\$ 17,293

On December 31, 2021, our plan's assets of \$18.5 million were invested in cash plus three separate funds including, a diversified growth fund (66.1%), corporate bonds (25.1%), and insurance contracts (5.3%). The growth fund aims to generate an "equity-like" return over an economic cycle with significantly reduced volatility relative to equity markets and has the scope to use a diverse range of asset classes, including equities, bonds, cash, and alternatives (e.g., property, infrastructure, high yield bonds, floating rate debt, private, equity, hedge funds and currency). These investments are intended to provide a degree of protection against changes in the value of our plan's liabilities related to changes in long-term expectations for interest rates and inflation expectations.

Expected future payments during the next ten years for our defined benefit pension plans are as follows:

Year Ending December 31,	
2022	\$ 1,778
2023	2,068
2024	2,847
2025	2,299
2026	5,395
2027 to 2031	18,739

ADVANCED ENERGY INDUSTRIES, INC.
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(in thousands, except per share amounts)

NOTE 18. STOCK-BASED COMPENSATION

As of December 31, 2021, we had two active stock-based incentive compensation plan: the 2017 Omnibus Incentive Plan ("the 2017 Plan") and the Employee Stock Purchase Plan ("ESPP"). We issue all new equity compensation grants under these two plans; however, outstanding awards previously issued under inactive plans will continue to vest and remain exercisable in accordance with the terms of the respective plans. Our stock plans are administered by the Board of Directors Compensation Committee. On December 31, 2021, there were 3.3 million shares reserved and 2.6 million shares available for future grant under our stock-based incentive plans.

On May 4, 2017, the stockholders approved the 2017 Plan, and all shares that were then available for issuance under the 2008 Omnibus Incentive Plan ("the 2008 Plan") are now available for issuance under the 2017 Plan. The 2017 Plan and 2008 Plan provide for the grant of stock options, stock appreciation rights, restricted stock, stock units (including deferred stock units), unrestricted stock, and dividend equivalent rights. Any of the awards issued may be issued as performance-based awards to align stock compensation awards to the attainment of annual or long-term performance goals. As of December 31, 2021, there were 1.9 million shares available for grant under the 2017 Plan.

Stock-based Compensation Expense

We recognize stock-based compensation expense based on the fair value of the awards issued and the functional area of the employee receiving the award. Stock-based compensation was as follows:

	Years Ended December 31,		
	2021	2020	2019
Equity classified awards	\$ 15,428	\$ 12,272	\$ 7,327
Liability classified awards	311	—	—
Stock-based compensation expense	<u>\$ 15,739</u>	<u>\$ 12,272</u>	<u>\$ 7,327</u>

Estimated forfeiture rates for our stock-based compensation expense applicable to stock options and RSUs were approximately 8%, 5% and 10% for the years ended December 31, 2021, 2020 and 2019, respectively.

Restricted Stock Units

Generally, we grant RSUs with a three-year time-based vesting schedule. Certain RSUs contain performance-based or market-based vesting conditions in addition to the time-based vesting requirements.

Changes in our unvested RSUs were as follows:

	Year Ended December 31, 2021	
	Number of RSUs	Weighted- Average Grant Date Fair Value
RSUs outstanding at beginning of period	608	\$ 58.15
RSUs granted	406	\$ 94.60
RSUs vested	(178)	\$ 62.82
RSUs forfeited	(209)	\$ 70.34
RSUs outstanding at end of period	<u>627</u>	<u>\$ 76.37</u>

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

The total intrinsic value of RSUs converted to shares for the years ended December 31, 2021, 2020 and 2019 were \$19.2 million, \$9.2 million, and \$8.3 million, respectively. As of December 31, 2021, there was \$21.4 million of total unrecognized compensation cost, net of expected forfeitures related to non-vested RSUs granted, which is expected to be recognized through December 2024, with a weighted-average remaining vesting period of 1.1 years.

Stock Options

Generally, we grant stock option awards with an exercise price equal to the market price of our stock at the date of grant and with either a three or four-year vesting schedule or performance-based vesting; however, no stock options were granted in 2021. Stock option awards generally have a term of ten years.

Changes in our stock options were as follows:

	<u>Year Ended December 31, 2021</u>	
	<u>Number of Options</u>	<u>Weighted-Average Exercise Price per Share</u>
Options outstanding at beginning of period	147	\$ 23.63
Options exercised	(35)	\$ 21.10
Options outstanding at end of period	<u>112</u>	<u>\$ 24.41</u>

The total intrinsic value of options exercised for the years ended December 31, 2021, 2020 and 2019 was \$2.6 million, \$1.9 million, and \$1.6 million, respectively. All options outstanding on December 31, 2021 are vested and have aggregate intrinsic value of \$7.5 million and weighted-average remaining contractual life of 3.0 years.

The following table summarizes information about the stock options outstanding on December 31, 2021:

<u>Range of Exercise Prices</u>	<u>Options Outstanding and Exercisable</u>		
	<u>Number Outstanding (In 000's)</u>	<u>Weighted-Average Remaining Contractual Life</u>	<u>Weighted-Average Exercise Price</u>
\$18.77	28	2.75 years	\$ 18.77
\$26.32	84	3.10 years	\$ 26.32
\$18.77 to \$26.32	<u>112</u>	<u>3.01 years</u>	<u>\$ 24.41</u>

Employee Stock Purchase Plan

The ESPP, a stockholder-approved plan, provides for the issuance of rights to purchase up to 1,000,000 shares of common stock. In May 2010, stockholders approved an increase from 500,000 to 1,000,000 shares authorized for sale under our ESPP. Employees below the Vice President level are eligible to participate in the ESPP if employed by us for at least 20 hours per week during at least five months per calendar year. Participating employees may contribute up to the lesser of 15% of their eligible earnings or \$5,000 during each plan period. Currently, the plan period is six months. The purchase price of common stock purchased under the ESPP is currently equal to the lower of 1) 85% of the fair market value of our common stock on the commencement date of each plan period or 2) 85% of the fair market value of our common shares on each plan period purchase date. On December 31, 2021, 0.7 million shares remained available for future issuance under the ESPP.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

Purchase rights granted under the ESPP are valued using the Black-Scholes-Merton model. As of December 31, 2021, there was \$0.6 million of total unrecognized compensation cost related to the ESPP that we expect to recognize over a remaining period of five months. The following table summarizes compensation expense related to the ESPP.

	Years Ended December 31,		
	2021	2020	2019
Stock-based compensation expense related to the ESPP	\$ 1,114	\$ 856	\$ 475

The fair value of each purchase right granted under the ESPP was estimated on the date of grant using the Black-Scholes-Merton option pricing model with the following assumptions:

	Years Ended December 31,		
	2021	2020	2019
Risk-free interest rates	0.04% - 0.10 %	0.10% - 0.18% %	1.62% - 2.31 %
Expected dividend yield rates	— %	— %	— %
Expected term	0.5 years	0.5 years	0.5 years
Expected volatility	42.7 %	70.1 %	41.3 %

The risk-free interest rate is based on the six-month U.S. Treasury Bill at the time of the grant. Our term is 0.5 years as purchases are made biannually. We utilize our historical experience in determining the volatility of our common stock over the expected term.

NOTE 19. COMMITMENTS AND CONTINGENCIES

We are 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 also 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. 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. We are not currently a party to any legal action that we believe would reasonably have a material adverse impact on our business, financial condition, results of operations or cash flows.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

NOTE 20. GEOGRAPHIC AND SIGNIFICANT CUSTOMER INFORMATION

The following table summarizes sales and percentages of total sales from customers who individually accounted for 10% or more of our sales:

	Years Ended December 31,					
	2021		2020		2019	
Applied Materials, Inc.	\$ 296,369	20.4 %	\$ 248,350	17.5 %	\$ 164,724	20.9 %
Lam Research Corporation	147,385	10.1 %	141,778	10.0 %	88,251	11.2 %

The following table summarizes the accounts receivable balances and percentages of the total accounts receivable from customers who individually accounted for 10% or more of accounts receivable:

	December 31, 2021		December 31, 2020	
	Applied Materials, Inc.	\$ 42,425	17.9 %	\$ 33,402
Nidec Motor Corporation	*	* %	\$ 24,344	10.4 %

* Customer's balance was less than 10% of total

Our sales to Applied Materials, Inc. and Lam Research Corporation are reflected in the Semiconductor Equipment and Industrial and Medical market. Our sales to Nidec Motor Corporation are reflected in the Industrial and Medical market. For more information on our markets, see *Note 3. Revenue*.

No other customer accounted for 10% or more of our sales or accounts receivable balances during these periods.

The following table summarizes long-lived assets by geographic area:

	December 31,	
	2021	2020
United States	\$ 255,791	\$ 253,115
Asia	275,260	283,549
Europe	57,144	60,847
Total	<u>\$ 588,195</u>	<u>\$ 597,511</u>

Long-lived assets include property and equipment, operating lease right-of-use assets, goodwill, and intangible assets.

NOTE 21. CREDIT FACILITY

In September 2019, in connection with the Artesyn Acquisition Agreement, we entered into a credit agreement ("Credit Agreement") that provided aggregate financing of \$500.0 million, consisting of a \$350.0 million senior unsecured term loan facility (the "Term Loan Facility") and a \$150.0 million senior unsecured revolving facility (the "Revolving Facility" and together with the Term Loan Facility, the "Credit Facility").

In September 2021, we amended the Credit Agreement whereby we borrowed an additional \$85.0 million, which increased the aggregate amount outstanding under the Term Loan Facility to \$400.0 million. In addition, we increased the Revolving Facility capacity by \$50.0 million to \$200.0 million. Both the Term Loan Facility and Revolving Facility mature on September 9, 2026.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – (continued)
(in thousands, except per share amounts)

The following table summarizes borrowings under our Credit Facility and the associated interest rate.

	December 31, 2021		
	Balance	Interest Rate	Unused Line Fee
Term Loan Facility subject to a fixed interest rate	\$ 255,719	1.271%	—
Term Loan Facility subject to a variable interest rate	139,281	0.890%	—
Revolving Facility subject to a variable interest rate	—	0.890%	0.10%
Total borrowings under the Credit Agreement	<u>\$ 395,000</u>		

For more information on the interest rate swap that fixes the interest rate for a portion of our Term Loan Facility, see *Note 8. Derivative Financial Instruments*. The Term Loan Facility and Revolving Facility bear interest, at our option, at a rate based on a reserve adjusted "Eurodollar Rate" or "Base Rate," as defined in the Credit Agreement, plus an applicable margin.

For all periods presented, we were in compliance with the Credit Agreement covenants. As of December 31, 2021 and December 31, 2020, we had \$200.0 million and \$150.0 million, respectively, available to withdraw on the Revolving Facility.

The fair value of the Term Loan Facility approximates the outstanding balance of \$395.0 million as of December 31, 2021.

The debt obligation on our Consolidated Balance Sheets consists of the following:

	December 31, 2021	December 31, 2020
Term Loan Facility	\$ 395,000	\$ 323,750
Less: debt issuance costs	(2,267)	(1,704)
Total debt	392,733	322,046
Less current portion of long-term debt	(20,000)	(17,500)
Total long-term debt	<u>\$ 372,733</u>	<u>\$ 304,546</u>

Contractual maturities of our debt obligations, excluding amortization of debt issuance costs, are as follows:

Year Ending December 31,	
2022	\$ 20,000
2023	20,000
2024	20,000
2025	20,000
2026	315,000
Total	<u>\$ 395,000</u>

Interest expense and unused line of credit fees were recorded in Other income (expense), net in our Consolidated Statements of Operations as follows:

	Years Ended December 31,		
	2021	2020	2019
Interest expense	\$ 3,969	\$ 5,080	\$ 2,994
Amortization of debt issuance costs	822	519	186
Unused line of credit fees and other	168	153	236
Total interest expense	<u>\$ 4,959</u>	<u>\$ 5,752</u>	<u>\$ 3,416</u>

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

Not applicable.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We have established disclosure controls and procedures, which are designed to ensure that information required to be disclosed in reports filed or submitted under the Securities Exchange Act of 1934 ("Act") is recorded, processed, summarized, and reported, within the time periods specified in the Securities and Exchange Commission's rules and forms. These disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed in the reports that we file or submit under the Act is accumulated and communicated to management, including our Principal Executive Officer (Stephen D. Kelley, President and Chief Executive Officer) and Principal Financial Officer (Paul Oldham, Chief Financial Officer), as appropriate, to allow timely decisions regarding required disclosures.

As of the end of the period covered by this report, we conducted an evaluation, with the participation of management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of the disclosure controls and procedures pursuant to the Exchange Act Rule 13a-15(b). Based upon this evaluation, the Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2021. The conclusions of the Chief Executive Officer and Chief Financial Officer from this evaluation were communicated to the Audit Committee. We intend to continue to review and document our disclosure controls and procedures, including our internal controls over financial reporting, and may from time to time make changes aimed at enhancing their effectiveness and to ensure that our systems evolve with our business.

Management's Annual Report on Internal Control over Financial Reporting

It is management's responsibility to establish and maintain effective internal control over our financial reporting, which is a process designed under the supervision of our Chief Executive Officer and Chief Financial Officer and effected by our Board of Directors, management, and other personnel. Our internal control over financial reporting is designed to provide reasonable assurance concerning the reliability of our financial reporting and the preparation of our financial statements for external purposes in accordance with generally accepted accounting principles.

In June 2021, we acquired TEGAM, Inc. Refer to *Note 2. Acquisitions* in Part II, Item 8 "Financial Statements and Supplementary Data" for additional information. TEGAM's objectives regarding internal controls over financial reporting are consistent, in all material respects, with Advanced Energy's objectives. We are in the process of completing a more comprehensive review of TEGAM's internal control over financial reporting and will be implementing changes to better align their reporting and controls with the rest of Advanced Energy. As a result of the timing of the acquisition, anticipated changes, and general guidance issued by the SEC regarding exclusion of certain acquired businesses, we excluded TEGAM from Advanced Energy's December 31, 2021 assessment of internal controls over financial reporting. TEGAM accounted for approximately 1% of our total assets at December 31, 2021, and 1% of our total net sales for the year ended December 31, 2021.

Management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our internal control over financial reporting as of December 31, 2021, using the criteria described in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based upon this evaluation, management concluded that our internal control over financial reporting was effective as of December 31, 2021.

Ernst & Young LLP, an independent registered public accounting firm, has audited our consolidated financial statements included in this Form 10-K, and as part of the audit, has issued an audit report, included herein, on the effectiveness of our internal control over financial reporting as of December 31, 2021.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting that occurred during 2021 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Limitations on Controls and Procedures

Management has concluded that our disclosure controls and procedures and internal control over financial reporting provide reasonable assurance that the objectives of our control system are met. We do not expect, however, that our disclosure controls and procedures or internal control over financial reporting will prevent or detect all misstatements, errors, or fraud, if any. All control systems, no matter how well designed and implemented, have inherent limitations, and therefore no evaluation can provide absolute assurance that every misstatement, error, or instance of fraud, if any, or risk thereof, has been or will be prevented or detected. The occurrence of a misstatement, error, or fraud, if any, would not necessarily require a conclusion that our controls and procedures are not effective.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Advanced Energy Industries, Inc.

Opinion on Internal Control Over Financial Reporting

We have audited Advanced Energy Industries, Inc.'s internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Advanced Energy Industries, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on the COSO criteria.

As indicated in the accompanying Management's Annual Report on Internal Control over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of TEGAM, Inc., which is included in the 2021 consolidated financial statements of the Company and constituted 1% and 2% of total and net assets, respectively, as of December 31, 2021 and 0.6% and 0.5% of revenues and net income, respectively, for the year then ended. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of TEGAM, Inc.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2021, and the related notes and our report dated March 16, 2022 expressed an unqualified opinion thereon.

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 Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

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

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

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

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

/s/ Ernst & Young LLP

Denver, Colorado
March 16, 2022

ITEM 9B. OTHER INFORMATION

Not applicable.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

In accordance with General Instruction G(3) of Form 10-K, certain information required by this Part III is incorporated by reference to the definitive proxy statement relating to our 2022 annual meeting of stockholders (the "2022 Proxy Statement"), as set forth below. The 2022 Proxy Statement will be filed with the Securities and Exchange Commission within 120 days after the end of our fiscal year.

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

The information set forth in the 2022 Proxy Statement under the headings "Management" and "Proposal No. 1 - Election of Directors" is incorporated herein by reference.

We adopted a Code of Ethical Conduct that applies to all employees, including our Chief Executive Officer, Chief Financial Officer, and others performing similar functions. We posted a copy of the Code of Ethical Conduct on our website at www.advancedenergy.com, and such Code of Ethical Conduct is available, in print, without charge, to any stockholder who requests it from the Company's Secretary. We intend to satisfy the disclosure requirements under Item 5.05 of Form 8-K regarding amendments to, or waivers from, the Code of Ethical Conduct by posting such

information on our website at www.advancedenergy.com. We are not including the information contained on our website as part of, or incorporating it by reference into, this report.

ITEM 11. EXECUTIVE COMPENSATION

The information set forth in the 2022 Proxy Statement under the headings "Executive Compensation" is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information set forth in the 2022 Proxy Statement under the headings "Security Ownership of Certain Beneficial Owners and Management" and "Equity Compensation Plan Information" is incorporated herein by reference.

Securities Authorized for Issuance under Equity Compensation Plans

The following table summarizes information about the equity incentive compensation plans as of December 31, 2021. All outstanding awards relate to our common stock.

Plan Category	(A) Number of securities to be issued upon exercise of outstanding options, warrants and rights	(B) Weighted average exercise price of outstanding options, warrants and rights	(C) Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column A)
		(in thousands, except exercise price per share)	
Equity compensation plans approved by security holders	112	\$ 24.41	2,554 (1)
Equity compensation plans not approved by security holders	—	—	—
Total	112	\$ 24.41	2,554

(1) This number includes 665 thousand shares available for future issuance under the Employee Stock Purchase Plan

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Not applicable.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information set forth in the 2022 Proxy Statement under the caption "Proposal No. 2 - Ratification of the Appointment of Ernst & Young LLP as Advanced Energy's Independent Registered Public Accounting Firm for 2022" is incorporated herein by reference.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(A) Documents filed as part of this Annual Report on Form 10-K are as follows:

1. Financial Statements:

See Index to Financial Statements at Part II, Item 8 herein.

2. Financial Statement Schedules for the years ended December 31, 2021, 2020 and 2019

NOTE: All schedules have been omitted because they are either not applicable or the required information is included in the financial statements and notes thereto.

(B) Exhibits:

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
2.1	Stock Purchase Agreement by and among Advanced Energy Industries, Inc., Artesyn Embedded Technologies, Inc., Pontus Intermediate Holdings II, LLC and Pontus Holdings, LLC, dated May 14, 2019 **	8-K	000 - 26966	2.1	May 15, 2019
2.2	First Amendment to the Stock Purchase Agreement by and among Advanced Energy Industries, Inc., Artesyn Embedded Technologies, Inc., Pontus Intermediate Holdings II, LLC and Pontus Holdings, LLC, dated September 9, 2019 **	8-K	000 - 26966	2.2	September 10, 2019
3.1	Amended and Restated Certificate of Incorporation of Advanced Energy Industries, Inc.	10-Q	000 - 26966	3.1	August 5, 2019
3.2	Second Amended and Restated By-Laws of Advanced Energy Industries, Inc.	8-K	000 - 26966	3.1	May 20, 2020
4.1	Form of Specimen Certificate for Common Stock	S-1	33 - 97188	4.1	September 21, 1995
4.2	Description of Advanced Energy Industries, Inc. Securities	10-K	000 - 26966	4.2	March 2, 2020
10.1	Lease dated January 16, 2003, by and between China Great Wall Computer Shenzhen Co., Ltd., Great Wall Limited and Advanced Energy Industries (Shenzhen) Co., Ltd., for a building located in Shenzhen, China	10-K	000 - 26966	10.18	February 24, 2004
10.2	Form of Indemnification Agreement	S-1	33 - 97188	10.2	September 21, 1995
10.3	Form of Director Indemnification Agreement	8-K	000 - 26966	10.1	December 14, 2009
10.4	Form of Notice of Grant for Restricted Stock Unit *	8-K	000 - 26966	10.1	May 10, 2013
10.5	Form of Restricted Stock Unit Agreement *	8-K	000 - 26966	10.2	May 10, 2013
10.6	Form of Notice of Grant of Stock Option *	8-K	000 - 26966	10.3	May 10, 2013
10.7	Form of Incentive Stock Option Agreement *	8-K	000 - 26966	10.4	May 10, 2013
10.8	Form of Non-Qualified Stock Option Agreement *	8-K	000 - 26966	10.5	May 10, 2013
10.9	Form of LTI Notice of Grant *	8-K	000 - 26966	10.6	May 10, 2013
10.10	Form of LTI Performance Stock Option Agreement pursuant to the 2008 Omnibus Incentive Plan *	8-K	000 - 26966	10.7	May 10, 2013
10.11	Form of LTI Performance Stock Unit Agreement pursuant to the 2008 Omnibus Incentive Plan *	8-K	000 - 26966	10.8	May 10, 2013

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
10.12	Form of 2020 Short-Term Incentive Plan *	10-K	000 - 26966	10.13	March 2, 2020
10.13	2017 Long-Term Incentive (LTI) Plan *	DEF 14A	000 - 26966	Appendix A	March 14, 2017
10.14	2017 Short-Term Incentive (STI) Plan *	DEF 14A	000 - 26966	Appendix B	March 14, 2017
10.15	2017 Omnibus Incentive Plan *	DEF 14A	000 - 26966	Appendix A	March 14, 2017
10.16	2008 Omnibus Incentive Plan, as amended May 4, 2010 *	10-K	000 - 26966	10.37	March 2, 2011
10.17	Employee Stock Purchase Plan *	S-1	33 - 97188	10.17	September 21, 1995
10.18	Transition and Retirement Agreement dated February 8, 2021 *	8-K	000 - 26966	10.1	February 10, 2021
10.19	Offer Letter dated February 8, 2021 *	8-K	000-26966	10.2	February 10, 2021
10.20	Global Supply Agreement by and between Advanced Energy Industries, Inc. and Applied Materials, Inc. dated August 29, 2005 +	10-Q	000 - 26966	10.1	November 7, 2005
10.21	Shipping Amendment to the Global Supply Agreement by and between Advanced Energy Industries, Inc. and Applied Materials, Inc. dated August 29, 2005 +	10-Q	000 - 26966	10.2	November 7, 2005
10.22	Bridge Amendment to the Global Supply Agreement by and between Advanced Energy Industries, Inc. and Applied Materials, Inc. dated January 28, 2011 +	10-Q	000 - 26966	10.1	May 6, 2011
10.23	Fixed Dollar Accelerated Share Repurchase Transaction, dated November 6, 2015, between Advanced Energy Industries, Inc. and Morgan Stanley & Co. LLC.	8-K	000 - 26966	10.1	November 6, 2015
10.24	Offer Letter to Paul Oldham, dated March 26, 2018 *	8-K	000 - 26966	10.1	March 29, 2018
10.25	Form of Executive Change in Control and General Severance Agreement	8-K	000 - 26966	10.1	August 6, 2018
10.26	Credit Agreement, dated September 10, 2019, by and among Advanced Energy Industries, Inc., Bank of America N.A. as the Administrative Agent, Bank of America N.A., Bank of the West and HSBC Bank USA, N.A. as the Joint Lead Arrangers and Joint Book Runners, and Citibank N.A., as the Co-Manager	8-K	000 - 26966	10.1	September 10, 2019
10.27	ISDA 2002 Master Agreement, by and between Advanced Energy Industries, Inc. and HSBC Bank USA, National Association, dated as of April 2, 2020 (the "HSBC ISDA Master Agreement")	8-K	000 - 26966	10.1	April 10, 2020

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
10.28	ISDA 2002 Master Agreement, by and between Advanced Energy Industries, Inc. and Citibank, N.A., dated as of April 7, 2020 (the "Citibank ISDA Master Agreement")	8-K	000 - 26966	10.2	April 10, 2020
10.29	Schedule to the HSBC ISDA Master Agreement	8-K	000 - 26966	10.3	April 10, 2020
10.30	Schedule to the Citibank ISDA Master Agreement	8-K	000 - 26966	10.4	April 10, 2020
10.31	Rate Swap Transaction Confirmation, by and between Advanced Energy Industries, Inc. and HSBC Bank USA, National Association, dated April 7, 2020	8-K	000 - 26966	10.5	April 10, 2020
10.32	Rate Swap Transaction Confirmation, by and between Advanced Energy Industries, Inc. and Citibank, N.A., dated April 9, 2020	8-K	000 - 26966	10.6	April 10, 2020
10.33	Amendment No. 1 to Credit Agreement, dated September 9, 2021, by and among Advanced Energy Industries, Inc., the guarantors party thereto, Bank of America N.A. as the Administrative Agent, and the lenders party thereto (which included the marked Credit Agreement as Exhibit A thereto)	8-K	000-26966	10.2	September 9, 2021
10.34	Offer of Employment to Eduardo Bernal Acebedo dated August 2, 2021 *	8-K	000-26966	10.1	September 8, 2021
10.35	Form of Long-Term Incentive Plan	8-K	000-26966	10.1	February 4, 2021
10.36	Transition and Separation Agreement of Mr. Dana Huth, dated July 7, 2021 *	10-Q	000-26966	10.1	November 9, 2021
10.37	Advanced Energy Industries, Inc. Deferred Compensation Plan *	10-Q	000-26966	10.4	November 9, 2021
21.1	Subsidiaries of Advanced Energy Industries, Inc.				Filed herewith
23.1	Consent of Independent Registered Public Accounting Firm				Filed herewith
31.1	Certification of the Chief Executive Officer Pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				Filed herewith
31.2	Certification of the Principal Financial Officer Pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				Filed herewith

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
32.1	Certification of the Chief Executive Officer Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002				Filed herewith
32.2	Certification of the Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002				Filed herewith
101.INS	Inline XBRL Instance Document				Filed herewith
101.SCH	Inline XBRL Taxonomy Extension Schema Document				Filed herewith
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document				Filed herewith
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document				Filed herewith
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document				Filed herewith
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document				Filed herewith
104	Cover Page Interactive Data File (formatted as Inline XBRL with applicable taxonomy extension information contained in Exhibits 101)				Filed herewith

* Compensation Plan

** Schedules have been omitted pursuant to Item 601(b)(2) of Regulation S-K.

+ Confidential treatment has been granted for portions of this agreement.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.

ADVANCED ENERGY INDUSTRIES, INC.
(Registrant)

/s/ Stephen D. Kelley
Stephen D. Kelley
Chief Executive Officer

Date: March 16, 2022

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

<u>Signatures</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Stephen D. Kelley</u> Stephen D. Kelley	Chief Executive Officer and Director (Principal Executive Officer)	March 16, 2022
<u>/s/ Paul Oldham</u> Paul Oldham	Chief Financial Officer and Executive Vice President (Principal Financial and Accounting Officer)	March 16, 2022
<u>/s/ Grant H. Beard</u> Grant H. Beard	Chairman of the Board	March 16, 2022
<u>/s/ Frederick A. Ball</u> Frederick A. Ball	Director	March 16, 2022
<u>/s/ Anne DelSanto</u> Anne DelSanto	Director	March 16, 2022
<u>/s/ Tina M. Donikowski</u> Tina M. Donikowski	Director	March 16, 2022
<u>/s/ Ronald C. Foster</u> Ronald C. Foster	Director	March 16, 2022
<u>/s/ Edward C. Grady</u> Edward C. Grady	Director	March 16, 2022
<u>/s/ Lanesha Minnix</u> Lanesha Minnix	Director	March 16, 2022
<u>/s/ David W. Reed</u> David W. Reed	Director	March 16, 2022
<u>/s/ John A. Roush</u> John A. Roush	Director	March 16, 2022
<u>/s/ Thomas M. Rohrs</u> Thomas M. Rohrs	Director	March 16, 2022

Advanced Energy Industries, Inc.
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