2024 Annual Report











Advanced Energy

A Message from Our CEO

Dear Stockholders:

In 2024, we delivered solid financial results in a dynamic environment. Demand in the Semiconductor and Data Center Computing markets improved, offset by inventory digestion in the Industrial and Medical and Telecom and Networking markets. After hitting a low point in the first quarter, revenue increased every quarter through year-end and returned to year-over-year growth in the fourth quarter. In addition, we improved our gross margins each quarter throughout the year as we executed our multi-year manufacturing consolidation plan.

During the year, we made significant progress across our strategic initiatives. We accelerated new product introductions by launching 35 new platform products, as well as numerous custom and modified standard products. We invested in R&D to meet the strong demand for our best-in-class semiconductor platforms, including eVoS™, eVerest™ and NavX™, and our high-power artificial intelligence data center solutions. Our design-win momentum in Industrial and Medical continued to build, fueled by a healthy stream of new products, an enhanced customer-friendly website, and increased engagement with our distribution partners. Lastly, we are executing our financial initiatives by driving higher gross margins, controlling costs to fund critical program investments, and growing our cash position.

Looking forward, I believe Advanced Energy will extend its leadership in the precision power market. Customer qualification activity has been strong, and we expect to gain meaningful share as the market recovers. We expect our manufacturing and cost optimization initiatives to enable structurally higher margins and meaningful cash flow generation. In addition, we will continue to pursue strategic acquisitions for inorganic growth and complementary technologies.

At our November 2024 Analyst Day, we outlined a 2030 target model, which calls for doubling revenue, expanding gross margin, and growing earnings per share. With a diverse set of attractive end markets, strong customer relationships, one of the broadest portfolios of power technologies, a large team of over 1,500 power engineers, and a highly capable factory network, I am confident in our ability to achieve those long-term goals.

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

Best regards,

/s/ Stephen D. Kelley

Stephen D. Kelley
President and Chief Executive Officer
March 14, 2025

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, 2024

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	**84-0846841**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
1595 Wynkoop Street, Suite 800, Denver, Colorado	**80202**
(Address of principal executive offices)	(Zip Code)

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

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, $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.

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. ☑

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to section 240.10D-1(b). ☐

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 $4,065,435,423 as of June 30, 2024, based upon the price at which such common stock was last sold on such date.

As of February 6, 2025, there were 37,721,671 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 2025 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, 2024).

ADVANCED ENERGY INDUSTRIES, INC.
FORM 10-K
TABLE OF CONTENTS

	PART I	4
ITEM 1.	BUSINESS	4
ITEM 1A.	RISK FACTORS	11
ITEM 1B.	UNRESOLVED STAFF COMMENTS	25
ITEM 1C.	CYBERSECURITY	26
ITEM 2.	PROPERTIES	27
ITEM 3.	LEGAL PROCEEDINGS	27
ITEM 4.	MINE SAFETY DISCLOSURES	27
	PART II	28
ITEM 5.	MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES	28
ITEM 6.	RESERVED	29
ITEM 7.	MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS	30
ITEM 7A.	QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK	41
ITEM 8.	FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA	43
ITEM 9.	CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE	85
ITEM 9A.	CONTROLS AND PROCEDURES	85
ITEM 9B.	OTHER INFORMATION	86
ITEM 9C.	DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS	86
	PART III	86
ITEM 10.	DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE	87
ITEM 11.	EXECUTIVE COMPENSATION	87
ITEM 12.	SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS	87
ITEM 13.	CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE	88
ITEM 14.	PRINCIPAL ACCOUNTING FEES AND SERVICES	88
	PART IV	88
ITEM 15.	EXHIBIT AND FINANCIAL STATEMENT SCHEDULES	88
ITEM 16.	FORM 10-K SUMMARY	92
	SIGNATURES	93

Special Note on Forward-Looking Statements

This annual report on Form 10-K contains, in addition to historical information, forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). Statements in this report that are not historical information are forward-looking statements. For example, statements relating to our beliefs, expectations and plans are forward-looking statements, as are statements that certain actions, conditions, events, or circumstances will continue. The inclusion of words such as "anticipate," "expect," "estimate," "can," "may," "might," "continue," "enable," "plan," "intend," "should," "could," "would," "will," "likely," "potential," "believe," and similar expressions and the negative versions thereof indicate forward-looking statements; however, not all forward-looking statements may contain such words or expressions. These forward-looking statements are based upon information available as of the date of this report and management's current estimates, forecasts, and assumptions. Although we believe that our expectations reflected in or suggested by these forward-looking statements are reasonable, we may not achieve the results, performance, plans, or objectives expressed or implied by such forward-looking statements. Forward-looking statements involve risks and uncertainties, which are difficult to predict and many of which are beyond our control.

Risks and uncertainties to which our forward-looking statements are subject include:

- volatility and business fluctuations in the industries in which we compete;
- our ability to achieve design wins with new and existing customers;
- our ability to accurately forecast and meet customer demand;
- risks related to global economic conditions, such as the impact of escalating global conflicts on macroeconomic conditions, economic uncertainty, market volatility, rising interest rates, inflation, lack of growth in our markets, or recession;
- customer price sensitivity;
- concentration of our customer base;
- risks associated with potential breach of our information security measures— either external breach or internal data theft;
- difficulties with the implementation of our enterprise resource planning and other enterprise-wide information technology system applications;
- our loss of or inability to attract and retain key personnel;
- risks associated with our manufacturing footprint optimization and movement of manufacturing locations for certain products;
- disruptions to our manufacturing operations or those of our customers or suppliers;
- our ability to successfully identify, close, integrate and realize anticipated benefits from our acquisitions;
- quality issues or unanticipated costs in fulfilling our warranty obligations (including our discontinued solar inverter product line);
- risks inherent in our international operations, including the effect of export controls, the impact of tariffs on our supply chain or products we sell, political and geographical risks, and fluctuations in currency exchange rates;
- our ability to enforce, protect and maintain our proprietary technology and intellectual property rights;
- regulatory risk related to our supply chain;
- legal matters, claims, investigations, and proceedings;
- changes to tax laws and regulations or our tax rates;

- changes in federal, state, local and foreign regulations, including with respect to trade compliance, privacy and data protection, supply chain, and environmental regulation;
- effect of our debt obligations and restrictive covenants on our ability to operate our business;
- risks related to our unfunded pension obligations;
- our estimates of the fair value of intangible assets; and
- the potential impact of dilution related to our convertible debt, hedge, and warrant transactions.

Actual results could differ materially and adversely from those expressed in any forward-looking statements, and readers are cautioned not to place undue reliance on forward-looking statements. Factors that could contribute to these differences or prove our forward-looking statements, by hindsight, to be overly optimistic or unachievable include, but are not limited to, the risks and uncertainties listed above and described in Part I, Item 1A "Risk Factors." We assume no obligation to update any forward-looking statement or provide the reasons why our actual results might differ.

Market and Industry Data

The market and industry information used in this annual report on Form 10-K is based on management's good faith estimates, which we derive from our review of internal information and independent sources. Although we believe these independent sources to be reliable, we have not 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," "our Company," "we," "us" or "our" refer to Advanced Energy Industries, Inc. and its consolidated subsidiaries.

ITEM 1. BUSINESS

Company Overview

Advanced Energy provides highly engineered, 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 products enable customers to reduce or optimize their energy consumption through increased power conversion efficiency, power density, power coupling, and process control across a wide range of applications.

We are organized on a global, functional basis and operate as a single segment of power electronics conversion products. Within this segment, our products are sold into the Semiconductor Equipment, Industrial and Medical, Data Center Computing, and Telecom and Networking markets.

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 Events

Airity Acquisition

On June 20, 2024, we acquired Airity Technologies, Inc. ("Airity"). This acquisition added high voltage power conversion technologies and products, broadening our range of targeted applications within the Semiconductor Equipment and Industrial and Medical markets. See *Note 2. Acquisition* in Part II, Item 8 "Financial Statements and Supplementary Data."

2024 Restructuring Plan

In 2024, we approved further manufacturing consolidation initiatives, including the closure of our Zhongshan, China manufacturing facility (the "2024 Plan"). In connection with the 2024 Plan, we recorded a $29.6 million charge primarily associated with expected employment-related charges and facility exit costs. See *Note 12. Restructuring, Asset Impairments, and Other Charges* in Part II, Item 8 "Financial Statements and Supplementary Data."

Credit Agreement Amendment

On September 9, 2024, we used existing cash on hand to prepay the full $345.0 million outstanding principal balance of the senior unsecured term loan facility (the "Term Loan Facility") under the credit agreement dated as of September 10, 2019, as amended (the "Credit Agreement"). On the same date, we entered into an additional amendment to the Credit Agreement to increase the capacity on our senior unsecured revolving facility (the "Revolving Facility") from $200.0 million to $600.0 million. As a result, as of December 31, 2024, our only outstanding debt was the Convertible Notes due in 2028. See *Note 18. Long-Term Debt* in Part II, Item 8 "Financial Statements and Supplementary Data."

Products and Services

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.

Our plasma power products enable innovation in complex semiconductor and thin film plasma processes such as dry etch and deposition. Our broad portfolio of high and low voltage power products is used in a wide range of applications, such as semiconductor equipment, industrial production, medical and life science equipment, data center computing, networking, and telecommunications. We also supply related sensing, controls, and instrumentation products primarily for advanced measurement and calibration of power and temperature for multiple industrial markets.

Our network of global service support centers provides repair services, calibration, conversions, upgrades, refurbishments, and used equipment to companies that use our products.

End Markets

Advanced Energy generates revenue from the sale of a broad range of advanced and system power products and services to global original equipment manufacturers ("OEMs") and end customers. Our customers select our products based on various performance metrics such as high power conversion efficiency, high power density, and low noise emission, as well as our ability to tailor our solutions to meet the unique requirements of their critical applications. The future growth and demand for our products is driven by a combination of factors within each of the end markets we serve, as follows:

Semiconductor Equipment Market

The Semiconductor Equipment market supports and enables the long-term growing need for more production capacity and new process technologies to meet expanding demand for semiconductor devices across many applications driven by megatrends such as artificial intelligence ("AI"), energy efficiency, automobile electrification and Internet of things ("IoT"). We believe long-term growth in the market will be driven by increased demand for wafer capacity, an increased number of etch and deposition process steps with new technology inflections, and the transition to advanced technology nodes requiring higher content of advanced power solutions per tool.

Our portfolio of power conversion and related products includes plasma power, high-voltage power, system power, and adjacent sensing solutions. Our plasma power solutions are used to create plasma-based etch and deposition processes. Our semiconductor market products are incorporated into a wide range of applications, including dry etch and strip, deposition, ion implant, inspection and metrology, thermal, epitaxy, and back-end test and packaging.

Our strategy is to outgrow the wafer fabrication equipment ("WFE") market by developing products for applications that are growing faster than market and through market share gains in both plasma power and adjacent semiconductor applications. We believe the plasma power market will grow faster than WFE due to increasing number of plasma etch and deposition process steps and growing demand for more complex and high power content. In addition, we are targeting to win customer adoptions of our new products to strengthen our positions in our core applications with leading market share, such as conductor etch and deposition, and to grow our market position in targeted applications with lower market share, such as dielectric etch. Finally, we are targeting to leverage our broad portfolio of system power, thermal and sensing, remote plasma source, and high voltage products to gain share in these adjacent semiconductor applications.

Industrial and Medical Market

The Industrial and Medical market is fueled by continued investment in complex manufacturing processes, increased adoption of new industrial technologies such as automation and clean energy, and increased breadth and precision requirements of medical devices and life science equipment.

We supply this market with critical, precision power conversion products that deliver precise and highly reliable, low noise and/or differentiated power. In addition, our sensing, control, and instrumentation products complement our power solutions. Our products are used in a wide variety of applications, such as advanced material fabrication, medical devices, analytical instrumentation, test and measurement equipment, robotics, industrial production, and large-scale connected light-emitting diode applications. We serve our broad customer base through both our direct sales force and indirect sales channels including independent sales representatives and distributors.

Our strategy in the market is to penetrate a broader set of applications by expanding our product offerings, leveraging common platforms, providing platform derivatives, and offering customizations. In addition, our strategy is to expand our customer reach in this large, fragmented market through a focused direct sales team on larger and strategic accounts, optimize and leverage our distribution channel, and expand visibility and access to our products through our digital footprint and website.

Data Center Computing Market

The Data Center Computing market is driven by shifts from traditional enterprise, on-premise computing to cloud computing, as well as the rapid growth of AI and related investments. The accelerated pace of higher power for next generation AI processors has increased the power requirement for AI-based servers and racks, accelerated the transition to high-power 48 volt power shelf infrastructure, and amplified the importance of high power efficiency, density, and reliability for server rack power solutions.

Advanced Energy serves as a leading provider of high-efficiency, high-density, server power conversion solutions and technologies with a proven track record of delivering production-ready products. Our products are designed into data center server and storage systems, as well as used by cloud service providers and their partners in their custom designed server racks and power shelves.

Our strategy in the market is to target high-end, high power, differentiated applications based on our competitive strengths in power density, efficiency, reliability, and speed in delivering next-generation, production-ready products.

Telecom and Networking Market

Demand in the Telecommunication and Networking market is driven by adoption of more advanced mobile standards, such as 5G technologies, networking investments by telecommunication service providers, enterprises upgrading their communication networks, and data centers investing in their networks for increased bandwidth.

We serve this market by providing application-specific AC-DC and DC-DC power conversion products to many leading OEMs of wireless infrastructure equipment and computer networking equipment. Our solutions are often customized with unique features such as ruggedization for mobile radio in the field.

Our strategy in the market is to optimize our power conversion products to more differentiated applications and leverage investments across our power portfolio to maintain a position in the most attractive customers and applications.

For more information related to our expectations for the markets we serve, see Business Environment and Trends in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Customers

Our products are sold worldwide to OEMs, distributors, and directly to end users.

During the year ended December 31, 2024, Applied Materials, Inc. and Lam Research Corporation accounted for 26% and 11%, respectively, of our total revenue. During the year ended December 31, 2023, Applied Materials, Inc. accounted for 22% of our total revenue. We expect that the sale of products to our largest customers will continue to account for a significant percentage of our revenue for the foreseeable future. The loss of a large customer could have a material adverse effect on our results of operations.

For more information related to our significant customers, see *Note 3. Revenue* in Part II, Item 8 "Financial Statements and Supplementary Data" and Part I, Item 1A "Risk Factors."

Marketing, Sales, and Distribution

We sell our products through direct and indirect sales channels. Our primary direct sales operations are located in the United States ("U.S."), Asia, and Europe.

In addition to a direct sales force, we have distributors that support our selling efforts. We maintain customer service offices in 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.

Refer to *Note 3. Revenue* in Part II, Item 8 "Financial Statements and Supplementary Data" for information regarding our revenue by geographic area. See Part I, Item 1A "Risk Factors" for a discussion of certain risks related to our sales and marketing operations.

Manufacturing

We manufacture our products primarily in the Philippines, Malaysia, Mexico, and China. We also perform limited specialty manufacturing for some of our products in the U.S., the United Kingdom, and Europe. In 2024, as part of our multi-year factory optimization and consolidation initiatives, we announced the closure of our Zhongshan, China manufacturing facility and several smaller manufacturing sites, expanded capacity in our Mexico factory, and progress on a new factory near Bangkok, Thailand, which we expect to be operational in 2026.

Our manufacturing requires a wide variety of mechanical and electrical components, which are often made 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 ensure that parts are available from multiple qualified suppliers and at the lowest possible cost, some key parts may only be obtained from a sole supplier or a limited group of suppliers. We address supply challenges and reduce the associated risks to production by endeavoring to select and qualify alternate suppliers for key parts, maintain appropriate inventories of critical components, and competitively source parts through electronic bidding tools to find the lowest possible total cost.

See Part I, Item 1A, "Risk Factors" for a discussion of certain risks related to our manufacturing operations.

Intellectual Property

Protection of our technology assets through intellectual property rights is important for our competitive position. We believe that continued research and development of technologically advanced solutions and applications is critical for us to compete effectively 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. Our investments in research and development enable us to create intellectual property, including patents and trade secrets. We hold numerous U.S. and foreign patents and have multiple patent applications pending in the U.S., Europe, and Asia.

See Part I, Item 1A, "Risk Factors" for a discussion of certain risks related to our reliance on our intellectual property.

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, meeting customer demand, and level of customer service and support.

We encounter substantial competition from foreign and domestic companies for each of our markets. Some of our competitors have greater financial and other resources than we do. Other competitors are smaller than we are but may be well established in specific product niches. Competitors in each of our market verticals include, but are not limited to, the following:

Semiconductor Equipment	Industrial and Medical	Data Center Computing	Telecom and Networking
COMET Holding AG.	Cosel Co., Ltd.	Acbel Polytech Inc.	Acbel Polytech Inc.
Daihen Corp.	Delta Electronics, Inc.	Delta Electronics, Inc.	Delta Electronics, Inc.
MKS Instruments, Inc.	MEAN WELL Enterprises	Flex Ltd.	Lite-On Technology Corp.
TRUMPF Hüttinger GmbH + Co. KG	TDK-Lambda Americas Inc.	Lite-On Technology Corp.	
	TRUMPF Hüttinger GmbH + Co. KG		
	XP Power Ltd.		

Research and Development

We perform research and development to develop products to address new or emerging applications, make technological advances to provide higher performance, lower cost, or create other attributes that we may expect to appeal to current or potential customers. 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 developing new products and enhancing existing products, and we expect these investments to continue. For the years ended December 31, 2024, 2023, and 2022 our research and development expenses were $211.8 million, $202.4 million, and $191.0 million, respectively and have ranged from 10.4% to 14.3% of our total revenue.

Human Capital

Our people are our strength. We have a globally diverse workforce with approximately 10,000 employees as of December 31, 2024. Our employees are located across the globe in 16 countries and are comprised of approximately 56% male and 44% female employees. Our employees are not represented by unions, except for statutory organization rights applicable to our employees in China, Germany, and Mexico.

Culture

We are committed to nurturing a culture grounded in our core values: innovation, integrity, empowerment, partnership, accountability, and execution. These core values are the foundation of how we operate. We stive to provide an inclusive work environment where all of our employees feel respected, valued, and empowered. We recognize that diverse perspectives and collaboration enable us to drive innovation and future growth for our global customers and we remain committed to diversity. Through a combination of merit-based internal promotions and external hiring, we have continued to see increases in the number of diverse employees represented at the director and above level, as compared with 2023. We have a Corporate Diversity & Inclusion Steering Committee which provides guidance, coordination, and support to local diversity and inclusion activities. We also have an active Women's Leadership Forum focused on career development and internal networking.

Health and Safety

We are committed to providing a safe work environment for our employees and have a global team that is responsible for health and safety related activities including hazard and risk identification. We also strive to follow the standards of the Responsible Business Alliance Code of Conduct at selected manufacturing sites, which promotes labor, health, safety, environmental, and ethics best practices.

Employee Engagement

We are committed to providing a collaborative and productive work environment for our employees. We periodically conduct confidential employee surveys to solicit feedback on confidence in Company leadership, ethical conduct, work environment, career growth opportunities, and we continually evaluate suggestions on how we can make Advanced Energy a great place to work. We communicate the results of these confidential employee surveys with our employees, leaders, executive team, and Board of Directors and use the feedback to identify opportunities to drive improvements across our Company. In 2024, we launched Powering Technology Together, our employee value proposition, to highlight our commitment to providing a best-in-class employee experience for our people across the globe and to differentiate ourselves as an employer of choice. We believe our employee value proposition will help us build our employer brand and attract and retain the best talent.

Total Rewards

We provide market-competitive compensation and benefits to our employees to attract and retain a talented, highly engaged workforce. Our compensation programs are focused on equitable and fair pay practices, including market-based compensation.

Learning and Development

We create growth and development opportunities to support our employees and offer internal and external learning and development opportunities. We also perform internal talent reviews and succession planning. We provide a 10-week leadership essential training program for our people leaders across all corporate levels. We also have internship and graduate development programs designed to develop a talent pipeline.

Community Involvement

We have an active Community Investment Steering Committee and offer employees paid time off to participate in Company organized initiatives and volunteer with non-profit organizations of their choice. Our Child of Employee Scholarship Program, available to children of Advanced Energy employees, celebrates education accomplishments and provides financial support for them to pursue their career and learning goals. We also offer an annual Advanced Energy STEM (science, technology, engineering, and mathematics) Scholarship in the U.S. to support and develop emerging talent in STEM.

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.

Available Information

Our website address is *www.advancedenergy.com*. We make available, free of charge on our website, our annual reports 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 adversely impact our results and 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 SEC.

Business and Industry Risks

The industries in which we compete are subject to unpredictable fluctuation or cycles, which may be volatile.

As a supplier to the global semiconductor equipment, industrial, medical, data center computing, telecommunication, and networking industries, we are subject to business fluctuations, the timing, length, and volatility of which can be difficult to predict. We are impacted by sudden changes in customers' manufacturing capacity requirements and spending, which depend in part on technology transitions, capacity utilization, demand for customers' products, inventory levels relative to demand, access to affordable capital, and changes in geopolitical factors, including tariffs. These changes have affected the timing and amount of customers' purchases and investments in technology, and continue to affect our orders, net revenue, operating expenses, and net income. In addition, several of the markets in which we compete are highly cyclical and experience downturns characterized by diminished product demand, production overcapacity, high inventory levels, and price erosion, which has caused, and in the future could cause, our revenue and gross margin to decline, adversely impacting our results of operations. It is difficult to predict the timing, length, and severity of such fluctuations and downturns, and we may not be able to respond adequately or quickly to the changes in demand.

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, the semiconductor industry appears to be recovering from a cyclical downturn, and the Industrial and Medical market and Telecom and Networking market are rebalancing elevated inventory levels, which have adversely impacted demand for our products. If the semiconductor industry's recovery does not continue as anticipated, if the length, severity, and/or volatility of the lower demand environments in the Industrial and Medical market and Telecom and Networking market exceeds our expectations, if we fail to achieve further growth in our other markets, our results of operations could be adversely impacted.

We must achieve design wins to retain our existing customers and to obtain new customers, although design wins achieved may not necessarily result in substantial revenue or gross profit.

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 designed for capital equipment manufacturers typically have a lifespan of many years. Increasingly, we are required to accelerate our investment in research and development to meet the 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, the design windows may be narrow, and there is no assurance we will succeed with new design wins for our existing customers or new customers' next generations of equipment. For example, in the last few years, we have made significant investments to launch new technology platforms and products into the semiconductor and industrial and medical markets. If existing or new customers do not choose our designs or we cannot agree to pricing, volumes, and other key commercial terms with these customers, our market share may decline, potential revenues related to the lifespan of our products may not be realized, and our business, financial condition, and results of operations could be materially and adversely impacted. Further, our ability to generate revenue or gross profit from design wins is in part or wholly dependent upon the success of our customers' solutions.

Failure to accurately forecast customer demand, supply chain disruptions, or manufacturing interruptions or delays could affect our ability to meet customer demand, lead to higher costs, or result in excess or obsolete inventory.

We place orders with many of our suppliers based on our expectations as to demand for our products and our customers' forecasts. As the quarter and the year progress, such demand and product mix can change rapidly or we may realize that our customers' expectations were overly optimistic or pessimistic, especially when industry or general economic conditions change.

Our sales are primarily made on a purchase order basis or are pulled from "just in time" bins or hubs by our customers, and we generally do not have long-term purchase commitments from our customers. As a result, we are limited in our ability to predict the level of future revenue 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. Customers may delay delivery of products or cancel orders prior to shipment and may not be subject to cancellation penalties. Delays in delivery schedules and/or customer changes to backlog orders during any particular period could cause a decrease in revenue and have a material adverse effect on our business and results of operations. Orders with our suppliers cannot always be amended in response to changing demand conditions.

In addition, to assure availability of certain components or 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 does not meet expected levels, we might not be able to use all of the components that we are required to purchase under these commitments and agreements, and our cost of revenue may increase, which could have a material adverse effect on our results of operations. If demand for our products exceeds our customers' and our forecasts, we may not be able to timely obtain enough raw materials, parts, components, or subassemblies, on favorable terms or at all, to fulfill the excess demand. Furthermore, some of our products have lengthy lifecycles and are subject to supplier parts obsolescence, and sole-sourced parts can create challenges in terms of purchasing parts on reasonable terms and lead-times. These situations may lead to customers cancelling orders prior to shipment causing a decrease in revenue, which may have a material adverse effect on our business and results of operations.

In recent years, there was a shortage of critical components caused by a variety of factors, including increased demand for electronic components used in a wide variety of industries, the pandemic-driven rise in consumer demand for technology goods, logistics-related disruptions in shipping, capacity limitations at some suppliers, and labor shortages. These supply constraints led to longer lead times in procuring materials and subcomponents and, in some cases, meaningfully higher costs for the subcomponents. Our revenues, earnings, and cash flow may be adversely impacted if these conditions reoccur.

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

Uncertain or adverse economic and business conditions, including uncertainties and volatility in the financial markets, rising inflation and interest rates, economic recession, national debt, and fiscal or monetary concerns, could

materially adversely impact our operating results and financial condition. Disruptions in the global economy or financial markets, higher interest rates and market volatility could have an adverse impact on our access to and cost of capital. Additionally, tightening of credit markets, turmoil in the financial markets, and a weakening global economy have contributed in the past and could again contribute to slowdowns in the industries in which we operate and adversely impact the global demand for our products. Some of our key markets ultimately depend on a combination of consumer and business spending. Economic uncertainty exacerbates negative trends in consumer and business spending and may cause our customers to delay, cancel, or refrain from placing orders. Difficulties or increased costs in obtaining capital and uncertain market conditions may also lead to customer liquidity constraints, a reduction of revenue, and greater instances of nonpayment or other failures to perform their obligations. Adverse or uncertain economic conditions may similarly affect our key suppliers, which could affect their ability to deliver parts and result in delays for our products. Further, these conditions and uncertainty about future economic conditions could also 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.

If we are unable to maintain our pricing strategy or adjust our business strategy successfully for some of our product lines to reflect our customers' price sensitivity, our business and financial condition could be harmed.

Our customers continually exert pressure on us to reduce our prices and extend payment terms and we have been and may be required to enter into long term reduced pricing agreements, extended payment terms, exclusivity arrangements, and other unfavorable contract terms. In addition, we compete in markets in which customers may dual or multi-source their power supply products. We believe some of our Asia-based 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 would 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. Conversely, in 2022, we not only increased prices but also implemented surcharges across many of our products to reflect our higher supply chain costs. Although these price changes were generally accepted by our customers, we did experience some loss of business. We continue to execute our pricing strategies and practices; however, any future price increases 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 revenue and accounts receivable are concentrated among a few customers.

Consistent with prior years, a limited number of customers accounted for a significant portion of our business, revenue and accounts receivable. A significant decline in revenue from these or our other large customers, the loss of these or other large customers, or any inability to collect from large customers could materially and adversely impact our business, results of operations, and financial condition.

We expect that revenue from a few large customers will continue to account for a significant percentage of our total revenue in future periods; however, we generally do not have long-term purchase commitments. If our largest customers do not place orders, or if they substantially reduce, delay, or cancel orders, we may not be able to replace their business on a timely basis or at all. As a result, our future success depends on our ability to maintain and strengthen our existing customer relationships, build new customer relationships, and diversify our customer base. For more information about our significant customers, see *Note 3. Revenue* in Part II, Item 8 "Financial Statements and Supplementary Data."

If our information security measures are breached, disrupted, or fail, we may incur significant legal and financial exposure and liabilities.

As part of our day-to-day business, we process, transmit and store our own confidential data and certain data about our customers and employees in our global information technology system. We are subject to ongoing data security threats, including phishing attempts, denial of service attacks, ransomware, viruses, and other malware, employee error or malfeasance, theft, natural disasters, and hardware or software malfunctions, any one of which could compromise our data security, cause the loss of critical data, or disrupt operations, which could materially adversely

affect our business and results of operations. Additionally, third parties may attempt to fraudulently induce employees or customers into disclosing sensitive information such as usernames, passwords, or other information to gain access to our customers' data or our data or our information technology systems. We and our third party providers have experienced, and expect to continue to experience, cybersecurity events or confidential information theft incidents, some of which could be devastating. We continue to devote significant resources to cybersecurity, IP protection, data encryption, and other measures to protect our systems and data from unauthorized external access or internal misuse, and we may be required to expend greater resources in the future for cybersecurity protection, compliance, and remediation, especially in the face of continuously evolving and increasingly sophisticated cybersecurity threats and privacy and data protection laws.

Despite our implementation of cybersecurity measures, there is no assurance that our actions will be sufficient to prevent future threats and incidents. 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. A cybersecurity event or other breach, disruption, or failure of our information and operational systems, could:

- result in the disclosure, misuse, corruption, or loss of our confidential business information, intellectual property including trade secrets, or our customers' data;
- damage our reputation;
- lead to a loss of confidence by our current and potential customers;
- adversely impact our future revenue;
- disrupt our business;
- divert management attention; and
- expose us to significant remediation costs, legal liability, and litigation risk.

Difficulties with the implementation or transition to our next generation enterprise resource planning and other new enterprise-wide information technology system applications could harm our business and impact our results of operations.

Our business could be adversely affected to the extent we fail to appropriately manage, expand, and update our information technology infrastructure. In particular, we are in the process of implementing a global enterprise resource planning ("ERP") system and other enterprise-wide applications that will upgrade and standardize our information systems. These implementations are expected to occur in phases over the next several years. Any delays, challenges, or failure to achieve our implementation goals may adversely impact our operations. In addition, the failure to anticipate the necessary readiness and training needs, manage the transition to systems, or appropriately convert historical and concurrent data could lead to business disruption and potential loss of business. Failure or abandonment of any part of the ERP system could result in a write-off of part or all of the costs that have been capitalized on the project.

The loss of and inability to attract and retain key personnel could significantly harm our results of operations and competitive position.

Our success depends to a significant degree upon the continuing contributions of our management, technical, marketing, and sales employees. We may not be successful in retaining our employees or attracting and retaining additional skilled personnel as required. If we are unable to attract, retain, and motivate qualified employees and leaders, we may be unable to fully capitalize on current and new market opportunities, which could adversely impact our business and results of operations. 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 readiness for and availability of career development opportunities, and our ability to offer a challenging and rewarding work environment. We have experienced, and may continue to experience, increasing costs to attract and retain needed talent, driven by macroeconomic conditions and a highly competitive labor market.

In addition, the loss or retirement of key employees presents particular challenges to the extent the departing employee had particularly valuable knowledge or experiences. This requires us to identify and train existing or new employees to perform necessary functions, which we may be unable to do, or which could result in unexpected costs, reduced productivity, or difficulties with respect to internal processes and controls. If we fail to have succession plans in place or our succession plans do not operate effectively, we may not be able to maintain continuity and our business could be adversely affected.

We are consolidating our manufacturing footprint, which brings risks.

Our manufacturing facilities are located globally, and the majority of our products are manufactured in a select few key facilities. 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. Additionally, we are currently restructuring to optimize and consolidate our manufacturing operations and improve operating efficiencies, and we continue to evaluate our manufacturing facilities and may decide to conduct additional optimization and consolidation initiatives. These plans and any future initiatives may or may not be successful in achieving our intended results. If the expected costs and charges are greater than anticipated, the estimated cost savings are lower than anticipated, or we experience a loss of continuity or inefficiency during transitional periods, our business and results of operations may be adversely affected.

Disruptions to our manufacturing or other operations or the operations of our customers or suppliers, due to natural or other disasters, uncontrollable events or other issues could affect our results of operations.

Certain of our manufacturing and other operations are in locations subject to natural disasters, such as severe weather and geological events, including earthquakes or tsunamis, which could disrupt operations. Natural disasters, uncontrollable occurrences (including the emergence of pandemics, epidemics, or widespread outbreaks of infectious disease), or other operational issues at any of our manufacturing or other facilities could significantly reduce or disrupt our productivity and could prevent us from meeting our customers' requirements in a timely manner, or at all. In addition, our suppliers and customers are also subject to natural and other disaster risk exposure. A natural disaster, fire, explosion, pandemic, 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, workforce, supply chain, results of operations, financial condition, or cash flows.

Our long-term success and results of operations depend on our ability to successfully identify, close, integrate, and realize the anticipated benefits from our acquisitions and strategic investments.

As part of our business strategy, we have and will likely continue to acquire companies or businesses and make investments to further our business. Risks associated with these transactions are many, including the following which could adversely affect our financial results:

- the inability to source or complete transactions timely or at all;
- any obligation to pay a termination fee or undergo litigation resulting from failed deals;
- the failure to perform adequate due diligence on target companies;
- the failure to realize expected revenues, gross and operating margins, net income, and other returns from acquired businesses;
- the inability to successfully integrate product and/or service offerings to realize anticipated benefits from business combinations;
- the inability to integrate acquired business into our existing enterprise resource planning and other global information technology systems to realize productivity improvement and cost efficiencies;
- we have incurred and will incur additional depreciation and amortization expense over the useful lives of certain assets acquired in connection with business combination and, to the extent that the value of

goodwill or intangible assets acquired in connection with a business combination becomes impaired, we may incur additional material charges related to impairment of those assets;

- deterioration in our effective tax rate;
- a failure to retain and motivate key employees of acquired businesses;
- our ability to maintain appropriate business processes, procedures, and internal controls at the acquired business;
- litigation or claims associated with a proposed or completed transaction; and
- unknown, underestimated, undisclosed or undetected commitments or liabilities or non-compliance by acquired business with laws, regulations, or policies.

Our products may suffer from defects or errors leading to increased costs, damages, or warranty claims.

Our products use complex system designs and components that may contain errors or defects in designs, manufacturing, firmware, software, component parts, or other materials. The manufacture of these products often involves a highly complex and precise process and the utilization of specially qualified components. The production of many of our products also requires highly skilled labor. As a result of the technical complexity of these products, design defects, skilled labor turnover, changes in our or our suppliers' manufacturing processes or the inadvertent use of defective or nonconforming materials or components by us or our suppliers could adversely affect our manufacturing quality and product reliability. To the extent our products are defective or fail, we might be required to repair, redesign, replace, or recall those products, pay damages (including liquidated damages), or fulfill warranty claims, and we could suffer significant expenses as well as harm to our reputation. Furthermore, some of our products are used in medical device applications where malfunction of the device could result in serious injury. 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.

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 product warranties ranging from one 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 have experienced claims from customers and suppliers and are involved in 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 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 our Consolidated Statements 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 contracts can be performed profitably, and our business 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 the cost of repair parts, among other factors.

International Operations Risks

We are subject to risks inherent in international operations.

We are a global organization. We have employees in 16 countries, our manufacturing facilities are located across the globe (mainly in the Asia-Pacific region), and revenue from customers outside the United States represented 66% of our total revenue during the year ended December 31, 2024.

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 adversely affected by liquidity, credit deterioration, inflation, foreign currency exchange rate fluctuations, financial results, economic risk, political risk, sovereign risk, or other factors.

Additionally, our success producing goods internationally and competing in international markets is subject to our ability to manage various operational 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;
- interruptions to our and/or our suppliers' supply chain;
- global trade issues and changes in and uncertainties with respect to trade and export regulations, trade policies and sanctions, tariffs, and international trade disputes, including export regulations for certain exports to China and any retaliatory measures;
- 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 contract rights;
- ineffective or inadequate legal and physical protection of intellectual property rights in certain countries;
- delays or restrictions on personnel travel and in shipping materials or finished products between and within countries;
- political instability, international hostilities, natural disasters, health epidemics, disruptions in financial markets, and deterioration of economic conditions;
- our ability to maintain appropriate business processes, procedures, and internal controls, and comply with environmental, health and safety, anti-corruption, and other regulatory requirements;
- customs regulations 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;
- changes in tariffs, income tax, value added tax, and foreign currency exchange rates; and
- laws and regulations regarding privacy, data use and processing, data privacy and protection, cybersecurity, and network security.

Our operations in the Asia Pacific region, including China, are subject to significant political and economic uncertainties over which we have little or no control and we may be unable to alter our business practice in time to avoid reductions in revenues.

A significant portion of our operations and supply chain outside the United States are located in the Asia Pacific region, including China, 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 local laws and regulations, possible retaliatory government actions, potential inability to enforce intellectual property protection or contracts terms, and changes in U.S. policy regarding overseas manufacturing and export controls. The U.S. and China regularly have significant disagreements over geopolitical, trade, and economic issues. Any escalating political controversies between the U.S. and China, whether or not directly related to our business, could have a material adverse effect on our operations, business, results of operations, and financial condition. Additionally, the Chinese government exercises substantial control over the Chinese economy, and our operations and supply chain in China may be subject to various government and regulatory interference. Policy changes, preferential treatment of local companies, or the imposition of new, stricter regulations or interpretations of existing regulations could require changes to our operating activities, increase our costs, or limit our ability to sell products in China. We continuously evaluate the risk of operations in China, including manufacturing and supply chain, and the potential financial impact to our operations.

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

Currency exchange rate fluctuations could have an adverse effect on our revenue and results of operations, and we could experience losses with respect to forward exchange contracts into which we may enter. Unfavorable currency fluctuations could significantly increase the labor and other costs incurred in the operation of our international facilities and the cost of raw materials, parts, components, and subassemblies that we source there, which could materially and adversely affect our results of operations. These increased costs could require us to increase prices to foreign customers, which could result in lower net revenue from 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 Asia and Europe creating more significant exposure to fluctuations in numerous currencies. 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.

Regulatory, Legal, Tax, and Compliance Related Risks

Continued restrictive global trade regulatory environment coupled with increasingly complex rules have adversely impacted our business, could further impact our business, and could erode the competitiveness of our products compared to local and global competitors.

As a global company, we are subject to the trade policies, export/import controls, and other rules and regulations, including tariffs, trade sanctions, and license requirements of the U.S. and other government authorities. We expect continued exposure to risk arising from ongoing activity in both the promulgation of newly imposed global trade regulations and increased enforcement of existing regulations. The implementation and interpretation of these complex rules and other regulatory actions is uncertain and evolving, trending towards continued increasing restrictions, which is deleterious to our business and challenging for us to manage our operations and forecast our operating results.

Since October 2022, we have been particularly affected by U.S. government-imposed export regulations on U.S. semiconductor and supercomputing technology and related parts and services sold in China. Over the past few years, the U.S. government has introduced several additional regulatory changes that impose extensive restrictions and compliance obligations, and Chinese customers may replace us with competitors who are not subject to U.S. export rules. Additionally, our ability to maintain business in China may be dependent at least in part on obtaining export licenses. Obtaining export licenses may be difficult, costly, and time-consuming, and there is no assurance we will be issued licenses in time to meet customer requirements or at all.

Recently, we were also subject to new anti-dumping and countervailing duty rates and increased Section 301 tariffs that took effect in 2024 and 2025 for certain products we import from China. The Trump Administration has threatened further tariffs on imports. If we are unable to mitigate the impact of these import restrictions, our costs and results of operations could be adversely affected.

We cannot predict the extent to which unfavorable international trade policies may be implemented in the future and to what extent our business may be impacted. Future regulatory changes that could materially and adversely affect our business include but are not limited to additional or increased tariffs, additions or updates to various restricted party lists, further restrictions on selling products to entities in certain countries whose actions or functions are intended to support policies contrary to U.S. national security, new customs rules or requirements, and retaliatory trade actions or trade wars. Additionally, with increasing geopolitical risks, we might experience customers or governments of our customers promoting their own domestic businesses and competitors. Any or all of the foregoing could decrease demand for our products, increase costs and decrease margins, reduce the competitiveness of our products, or restrict our ability to sell products, provide services or purchase necessary equipment and supplies, which in turn could have a material and adverse effect on our business, results of operations, or financial condition.

We are highly dependent on our intellectual property.

Our success depends significantly on our proprietary technology. We attempt to protect our intellectual property rights through a variety of methods including trade secrets, 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. Infringement, misappropriation, and unlawful use of our intellectual property rights, and resulting unauthorized manufacture or sale of equipment using our IP rights, could result in lost revenue. Monitoring and detecting any unauthorized use of intellectual property is difficult and costly and we cannot be certain that the protective measures we have implemented will completely prevent theft or misuse. If we are unable to protect our intellectual property successfully, our business, financial condition, and results of operations could be materially and adversely affected.

Patents, trademarks, and trade secret protection may not be adequate to deter infringement or misappropriation of our proprietary rights. For example, patents issued to us may be challenged, invalidated, or circumvented. The loss or expiration of any of our key patents could lead to a significant loss of sales of certain of our products and could materially affect our future operating results. The process of seeking patent protection can be time consuming and expensive and patents may not be issued for currently pending or future applications. Moreover, our existing patents or any new patents that may be issued may not be sufficient in scope or strength to provide meaningful protection or any commercial advantage to us. We may initiate claims, enforcement actions or litigation against third parties for infringement of our proprietary rights, which claims could result in costly litigation, the diversion of our technical and management personnel, and the assertion of counterclaims by defendants.

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 or no patent protection in other countries, including China. Consequently, manufacturing our products in China may subject us to an increased risk that unauthorized parties may attempt to copy our products or otherwise obtain or use our intellectual property. Generally, our efforts to obtain international patents have been concentrated in the European Union and Korea, Japan, and Taiwan.

Third parties may also assert claims against us and our products. Claims that our products infringe the rights of others, whether or not meritorious, can be expensive and time-consuming to defend and resolve, and may divert the efforts and attention of management and personnel. The inability to obtain rights to use third party intellectual property on commercially reasonable terms could also have an adverse impact on our business. In addition, we may face claims based on the theft or unauthorized use or disclosure of third party trade secrets and other confidential business information. Any such incidents and claims could severely harm our business and reputation, result in significant expenses, harm our competitive position, and prevent us from selling certain products, all of which could have a material and adverse impact on our business and results of operations.

Our supply chain is subject to regulatory risk.

Requirements applicable to our supply chain include rules aimed at promoting transparency as well as rules that restrict sourcing from certain locations or suppliers. For example, rules aimed at extinguishing forced labor require extensive efforts to map supply chains effectively and efficiently beyond tier 1 suppliers for any involvement in human rights abuses. Goods suspected of being manufactured with forced labor could be blocked from importation into the U.S., which could impact revenue. Another possible risk is foreign governments that restrict our access to supply; for example, if China were to further restrict export of rare earth minerals, our suppliers' ability to obtain such supply may be constrained and we may be unable to obtain sufficient quantities, or obtain supply in a timely manner, or at a commercially reasonable cost.

We are, and expect to continue to be, involved in litigation. Legal proceedings are costly and could have a material adverse effect on our commercial relationships, business, financial condition, and operating results.

We may be involved in legal proceedings, litigation, enforcement actions, or claims arising from our business, including, but not limited to, those regarding product performance, product warranty, product certification, product liability, patent infringement, misappropriation of trade secrets, other intellectual property rights, antitrust, environmental regulations, securities, contracts, unfair competition, employment, workplace safety, and other matters. Legal proceedings, enforcement actions and claims, whether with or without merit, and associated internal investigations, may be time-consuming and expensive to prosecute, defend or conduct; divert management's attention and other resources; inhibit our ability to sell our products or services; prevent us from using our technology; result in adverse judgments for damages, injunctive relief, penalties, and fines; and adversely affect our business. We can provide no assurance of the outcome of these legal proceedings, enforcement actions, or claims or that the insurance we maintain will provide coverage or be adequate to cover them.

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, our results could be adversely 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.

Furthermore, due to shifting economic and political conditions, tax policies, laws, or rates in various jurisdictions may be subject to significant changes in ways that could harm our financial condition and operating results. For example, various jurisdictions around the world have enacted or are considering revenue-based taxes such as digital services taxes and other targeted taxes, which could lead to inconsistent and potentially overlapping international tax regimes. The Organization for Economic Cooperation and Development is coordinating negotiations with the goal of achieving consensus around substantial changes to international tax policies, including the implementation of a minimum global effective tax rate of 15%. These changes could increase our effective tax rate and cash tax payments could increase in future years, create additional compliance burdens, and/or require changes to our tax compliance processes.

Increased governmental action on income tax regulations could adversely 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. As we are subject to examination by tax authorities in every jurisdiction where we do business, an unfavorable audit outcome could adversely affect us.

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 research and development capitalization and tax credit regulations, foreign-derived intangible income ("FDII"), global intangible low-tax income ("GILTI") and base erosion and anti-abuse tax ("BEAT") laws; 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 and related tax effects from 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, including the U.S., has made changes to numerous long-standing tax principles. There can be no assurance that these changes, once adopted by countries in which we operate, 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 customer 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. In addition, the interpretation and application of consumer and data protection laws in the U.S., Europe, China 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. Violation of any of these rules could result in fines or orders 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, through previous acquisitions, we expanded our presence in the medical market to include more highly regulated applications and added a 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.

We are subject to risks associated with environmental, health, and safety regulations.

We are subject to environmental, health, and safety regulations in connection with our global business operations, such as regulations related to the development, manufacture, sale, shipping, and use of our products; handling, discharge, recycling and disposal of hazardous materials used in our products or in producing our products; restrictions on the presence of certain substances in our products; the operation of our facilities; and the use of our real property. The failure or inability to comply with existing or future environmental, health and safety regulations, including with respect to energy consumption and climate change, could result in significant remediation or other legal liabilities; the imposition of penalties and fines; restrictions on the development, manufacture, sale, shipping, or use of certain of our products; limitations on the operation of our facilities or ability to use our real property; and a decrease in the value of our real property. We could also be required to alter our manufacturing, operations, and product design, and incur substantial expenses to comply with environmental, health and safety regulations. Any failure to comply with these regulations could subject us to significant costs and liabilities that could adversely affect our business, financial condition, and results of operations.

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.

Failure to adequately maintain appropriate ESG practices that meet diverse stakeholder expectations may result in an inability to attract customers, the loss of business, diluted market valuation, and an inability to attract and retain top talent. Maintaining possibly unlawful ESG programs could expose us to litigation threat. In addition, standards and processes for measuring and reporting carbon emissions and other sustainability metrics may change over time, resulting in inconsistent data, or could result in significant revisions to our sustainability commitments or our ability to achieve them. Any scrutiny of our carbon emissions or other sustainability disclosures or our failure to achieve related goals could adversely impact our reputation or performance. As governments impose greenhouse gas emission reporting and climate risk assessment requirements, along with other ESG-related laws, we are subject to at least some of these rules and concomitant regulatory risk exposure. Also, certain customers request ESG related performance data in relation to our products. ESG compliance and reporting costly, and we could be at a disadvantage compared to companies that do not have similar reporting requirements or that have more resources to devote to ESG efforts.

Commercial and Financial Related Risks

Our debt obligations and the restrictive covenants in certain of 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 debt. We may enter into additional debt obligations at any time.

Our Credit Agreement, including the associated revolving line of credit, imposes 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;
- conduct stock buybacks;
- 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.

Any breach of the covenants or other event of default could cause a default on our Credit Agreement, which could result in the entire outstanding balance at that time being immediately due and payable. Such breach or default may also constitute a default of our Convertible Notes, which could also result in the entire outstanding balance being immediately due and payable. 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 debt obligations or applicable laws or equity. There can be no assurance that we will have sufficient financial resources or be able to arrange financing to repay any borrowings at such time**.**

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 15. Employee Retirement Plans and Postretirement Benefits* in Part II, Item 8 “Financial Statements and Supplementary Data” contained herein.

Our intangible assets and goodwill may become impaired.

We periodically review the carrying value of our intangible assets and goodwill. We consider any events or circumstances that might result in either a diminished fair value, and 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.

The conditional conversion features of the Convertible Notes, if triggered, may adversely affect our financial condition and operating results.

In the event any of the conditional conversion features of the Convertible Notes are triggered, holders will be entitled to convert at any time during specified periods at their option. If one or more holders elect to convert, we would be required to settle any converted principal amount of such Convertible Notes through payment of cash, which could adversely affect our liquidity. In addition, even if holders do not elect to convert, we could be required under applicable accounting rules to reclassify all or a portion of the outstanding principal of the Convertible Notes as current rather than long-term liability, which would result in a material reduction of our net working capital.

Conversion of the Convertible Notes may dilute the ownership interest of our stockholders and the existence of the Convertible Notes may depress the price of our common stock.

The conversion of some or all of the Convertible Notes may dilute the ownership interests of our stockholders. Upon conversion, we have the option to pay or deliver, as the case may be, cash, shares of our common stock, or a combination of cash and shares of our common stock with respect to the remainder, if any, of our conversion obligation in excess of the aggregate principal amount of the Convertible Notes being converted. If we elect to settle the remainder, if any, of our conversion obligation in excess of the aggregate principal amount of the Convertible Notes being converted in shares of our common stock or a combination of cash and shares of our common stock, that action will dilute the ownership interest of our stockholders. Additionally, any sales in the public market of our common stock issuable upon such conversion could adversely affect prevailing market prices of our common stock.

In addition, the existence of the Convertible Notes may encourage short selling by market participants because the conversion could be used to satisfy short positions, and the anticipated conversion into shares of our common stock could depress the price of our common stock.

The hedges and warrants in our own common stock may adversely affect the common stock's trading price.

In September 2023, we entered into hedge and warrant transactions on our own common stock. These contracts are expected to reduce the potential dilution to our common stock upon any conversion of the Convertible Notes and/or offset any cash payments we are required to make in excess of the principal amount. The warrants could separately have a dilutive effect on our common stock to the extent that the market price per share of our common stock exceeds the exercise price.

In addition, the counterparties or their affiliates may modify their hedge positions by entering into or unwinding various derivatives with respect to our common stock and sell our common stock prior to the maturity of the Convertible Notes (and are likely to do so in connection with any conversion or redemption). This activity could cause fluctuations in the market price of our common stock.

We are subject to counterparty default risk with respect to the Note Hedges.

The counterparties are financial institutions, and we are subject to the risk that any or all of them might default. Our exposure is not secured by any collateral. If a counterparty becomes subject to insolvency proceedings, we will become an unsecured creditor. Our exposure will depend on many factors but, generally, an increase in our exposure will correlate to an increase in the market price and in the volatility of our common stock. In addition, counterparties may not be financially stable or viable. Upon a default by a counterparty, we may suffer adverse tax consequences and more dilution than we currently anticipate with respect to our common stock.

Risks Relating to Ownership of Our Common Stock

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 are 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.

We may not pay dividends on our common stock.

Holders of our common stock are only entitled to receive dividends when and if they are declared by our Board of Directors. Our Credit Agreement restricts our ability to pay dividends on our capital stock under certain circumstances. Although we have declared cash dividends on our common stock since 2021, we are not required to do so, and we may reduce or eliminate our cash dividend in the future. This could adversely affect the market price of our common stock. For information on our Credit Agreement, see *Note 18. Long-Term Debt* and *Note 7. Derivative Financial Instruments* in Part II, Item 8 "Financial Statements and Supplementary Data."

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 revenue 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.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 1C. CYBERSECURITY

Cybersecurity Risk Management and Assessment

Advanced Energy understands the importance of managing risks from cybersecurity threats and maintains a comprehensive cybersecurity program developed with reference to the National Institute of Standards and Technology ("NIST") cybersecurity framework. Our cybersecurity program includes administrative, organizational, technical, and physical safeguards reasonably designed to protect the confidentiality, integrity, and availability of our data. We devote significant resources to network, operations, and product security, data encryption, business continuity/disaster recovery, vulnerability management, event monitoring and incident response, and other measures to protect our systems and data from unauthorized external access or internal misuse, including, but not limited to, the following:

- Operational Security. Access to our systems is restricted to those who require access in accordance with the principle of least privilege. We also conduct background checks for our employees where permitted by local law, require signed confidentiality agreements and acceptable use agreements, and follow termination/access removal processes.
- Employee Training. We provide all employees with annual training on information security, data protection, and relevant Company policies so that they are empowered to identify cybersecurity risks and take action. To further enhance awareness and responsiveness to potential threats, we also conduct regular phishing simulations and email communications on cybersecurity trends awareness throughout the year.
- Third Party Assessment. We engage independent third party consultants to review the effectiveness and maturity of our cybersecurity program.
- Incident Response Plan. We maintain an incident response plan to respond to and mitigate the effects of an information security incident. The plan provides for the formation of a multi-functional incident response team led by the Chief Information Officer ("CIO") and comprised of IT, legal, corporate communications, internal audit, operational personnel, and members of the Board of Directors.
- Global Recovery. We have developed global cyber and disaster recovery processes for our information technology systems and critical information assets to preserve business continuity in the event of a cybersecurity incident.
- Third Parties. We have an assessment and audit process for third party vendors. Prior to granting key vendor access to our systems or data, we conduct pre-engagement diligence to ensure that each of our third party vendors involved in processing sensitive data have reasonable cybersecurity processes and procedures in place. We also have contractual provisions with key vendors for prompt notification of material cybersecurity incidents.
- Insurance. We maintain cyber insurance coverage to mitigate the risk of losses from a cybersecurity incident.
- Risk Monitoring. Management and our Board monitor cybersecurity and data protection developments, including new or forthcoming changes to the legislative and regulatory landscape as well as Advanced Energy's cybersecurity processes, investments, and actions as described below.

Cybersecurity risk is a component of Advanced Energy's broader risk management program and managed at the highest levels of the Company, starting with Advanced Energy's CIO, who meets with the Chief Executive Officer and other members of executive management regularly to discuss issues, assess risks, and coordinate Company-wide cybersecurity initiatives. Our CIO leads a dedicated cybersecurity technical team that manages, monitors, and enforces compliance with the cybersecurity program.

Although we have experienced non-material information security incidents from time to time in the past, in the last three years, we have not experienced any material cybersecurity incidents, nor has any incident had a material impact on our operations or financial condition. For a discussion of how risks from cybersecurity threats are reasonably likely to affect us, including our business strategy, results of operations, or financial condition, please see "If our information security measures are breached, disrupted, or fail, we may incur significant legal and financial exposure and liabilities" under the heading Part I, Item 1A "Risk Factors".

Cybersecurity Governance

Pursuant to its charter, the Audit and Finance Committee of our Board of Directors is principally responsible for oversight of managements' actions to monitor and control cybersecurity risk exposure. The CIO routinely reports to the Audit and Finance Committee on enterprise cybersecurity matters, including, as appropriate, information security strategy, policies, and procedures, status of cybersecurity initiatives, results of third party assessments, emerging cybersecurity threats and risks, steps taken to mitigate such threats and risks, and cybersecurity developments and trends. The Audit and Finance Committee reports to the full Board and, if warranted, coordinates with the Board to address material risks. In addition, two members of the Board have been delegated authority to serve as initial points of contact for the Board in the event of a severe information security incident. The full Board receives a cybersecurity briefing from the CIO annually.

As discussed above, our cybersecurity risk management and strategy are led by our CIO, who has extensive leadership experience with enterprise information technology in the manufacturing and telecom industries, where he has held various executive roles in which he developed and executed IT strategy, including cybersecurity programs, helped achieve and maintain Sarbanes-Oxley compliance, and brought companies into compliance with ISO 27001, among other things.

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
Penang, Malaysia	Manufacturing and distribution	Leased
Rosario, Philippines	Manufacturing	Owned
Santa Rosa, Philippines	Manufacturing	Leased
Zhongshan, China	Manufacturing (planned closure in 2025)	Leased
Mexicali, Mexico	Manufacturing	Leased
Bangkok, Thailand	Planned manufacturing	Leased
Littlehampton, United Kingdom	Manufacturing, distribution, sales, service, and research and development	Leased
Lockport, New York	Manufacturing, distribution, service, and research and development	Leased
Singapore, Singapore	Global operations headquarters (sales, service, and research and development)	Leased
Quezon, Philippines	Engineering, research and development, administration, and support	Leased
Taipei, Taiwan	Sales, distribution, and service	Leased
Sungnam City, South Korea	Sales, distribution, and service	Leased
Hong Kong, Hong Kong	Distribution and general and administrative	Leased

In addition to the above principal properties, we have several other facilities throughout 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 involved in disputes and legal actions arising in the normal course of our business. Although it is not possible to predict the outcome of these matters, we believe that the results of these proceedings will not have a material adverse effect on our financial condition, results of operations, or liquidity. For further information see *Note 17. 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

Market Information and Dividends

Our common stock is listed on the NASDAQ Global Select Market under the symbol "AEIS." On January 31, 2025, the number of common stockholders of record was 196. This does not include stockholders whose shares are held in "street name" through brokers or other nominees.

In each of the four quarters in 2024, we paid quarterly cash dividends of $0.10 per share, totaling $15.4 million for the full year. We currently anticipate that a quarterly cash dividend of $0.10 per share will continue to be paid on a quarterly basis, although the declaration of any future cash dividend is at the discretion of the Board and will depend on our financial condition, results of operations, capital requirements, business conditions, and other factors**.**

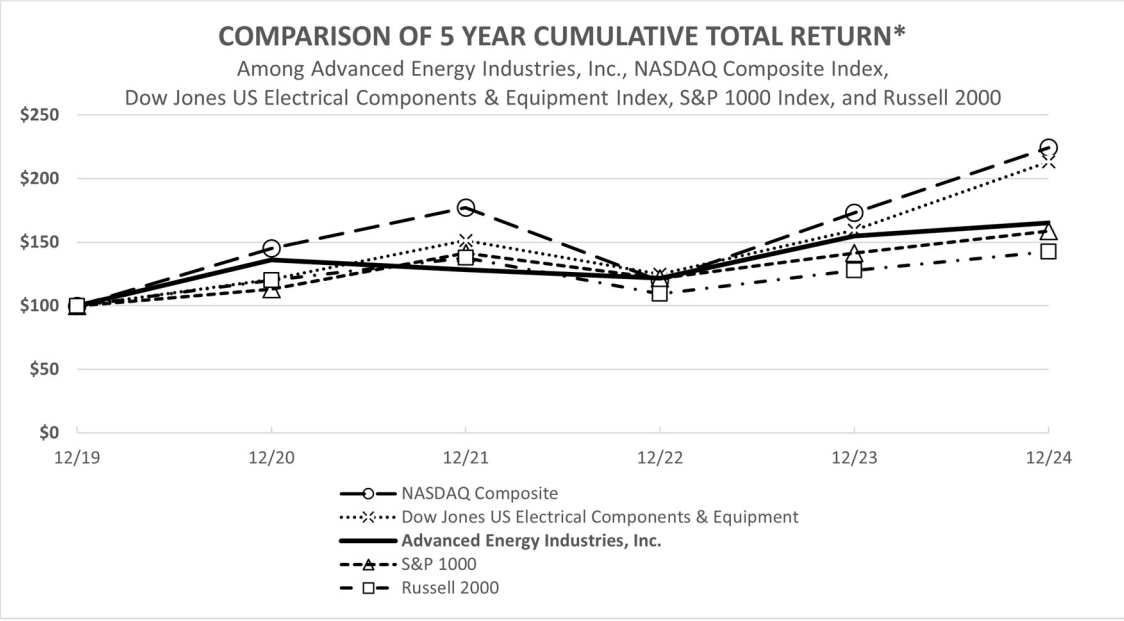
Purchases of Equity Securities by the Issuer

To repurchase shares of our common stock, we periodically enter into share repurchase agreements, open market transactions, and/or other transactions in accordance with applicable federal securities laws. Before repurchasing our shares, we consider the market price of our common stock, the nature of other investment opportunities, available liquidity, cash flows from operations, general business and economic conditions, and other relevant factors.

We did not repurchase any shares during the fourth quarter of 2024. At December 31, 2024, the remaining amount authorized by our Board for future share repurchases was $197.4 million with no time limitation.

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, 2019 through December 31, 2024. The comparison assumes $100 invested on December 31, 2019 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.



	December 31,					
	2019	2020	2021	2022	2023	2024
Advanced Energy Industries, Inc.	$ 100.00	$ 136.19	$ 128.44	$ 121.56	$ 154.97	$ 165.12
NASDAQ Composite	$ 100.00	$ 145.05	$ 177.27	$ 119.63	$ 173.11	$ 224.34
Dow Jones US Electrical Components & Equipment	$ 100.00	$ 120.75	$ 151.36	$ 124.87	$ 159.57	$ 213.20
S&P 1000	$ 100.00	$ 112.96	$ 141.54	$ 121.67	$ 141.49	$ 158.89
Russell 2000	$ 100.00	$ 119.93	$ 137.67	$ 109.50	$ 127.98	$ 142.73

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 2024 and 2023 and year-to-year comparisons between those periods.

Company Overview

Advanced Energy provides highly engineered, 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. Many of our products enable customers to reduce or optimize their energy consumption through increased power conversion efficiency, power density, power coupling, and process control across a wide range of applications.

We are organized on a global, functional basis and operate as a single segment of power electronics conversion products. Within this segment, our products are sold into the Semiconductor Equipment, Industrial and Medical, Data Center Computing, and Telecom and Networking markets.

On June 20, 2024, we acquired Airity Technologies, Inc. ("Airity"). This acquisition added high voltage power conversion technologies and products, broadening our range of targeted applications within the Semiconductor Equipment and Industrial and Medical markets. See *Note 2. Acquisition* in Part II, Item 8 "Financial Statements and Supplementary Data."

Business Environment and Trends

2024 Summary Results and Key Activities

For the year ended December 31, 2024, our revenue was $1,482.0 million, representing a decline of 10.5% as compared to 2023. The decline was attributable to lower revenue from our Industrial and Medical and Telecom and Networking markets due to customer inventory rebalancing, resulting in a lower demand environment. These declines were partially offset by higher revenues in the Semiconductor Equipment market, from the 2023 trough level, and growing AI-related demand in the Data Center Computing market. For more details on the trends in our end markets, see "End Markets Summary and Trends" elsewhere in this Item 7.

In 2024, we reported higher operating expenses of $492.7 million, an increase of $14.0 million primarily attributable to higher stock-based compensation expense, higher research and development ("R&D") program costs, higher restructuring charges from initiatives focused on optimizing manufacturing and support operations, partially offset by a general workforce reduction to align to our revenue levels. The restructuring actions should largely be completed in 2026 and are expected to enable a more efficient and cost-effective operating structure.

In the third quarter of 2024, we approved further manufacturing consolidation initiatives, including the closure of our Zhongshan, China manufacturing facility. In connection with the 2024 Plan, we recorded a $29.6 million charge primarily associated with expected employment-related charges and facility exit costs. See *Note 12. Restructuring, Asset Impairments, and Other Charges* in Part II, Item 8 "Financial Statements and Supplementary Data."

In the third quarter of 2024, we entered into an amendment to the Credit Agreement to increase the capacity on the Revolving Facility from $200.0 million to $600.0 million. This amendment was in connection with the concurrent prepayment, using existing cash on hand, of the full $345.0 million outstanding principal balance under our Term Loan Facility. See *Note 18. Long-Term Debt* in Part II, Item 8 "Financial Statements and Supplementary Data" and Liquidity and Capital Resources below.

During 2024, we continued progress on a new factory near Bangkok, Thailand, which we expect to be operational in 2026.

End Markets Summary and Trends

The demand environment in each of our markets is impacted by macroeconomic conditions, various market trends, customer buying patterns, design wins, and other factors. Although we are currently experiencing a lower demand environment in certain markets, we continue to believe that the long-term market growth drivers support our long-term strategy, research and development efforts, and capital investments. However, in the short-term it is unclear how certain macroeconomic conditions, including the effect of higher interest rates impacting end customers' capital investment, the timing of inventory digestion, and customer buying patterns, will affect customer demand and our revenue.

Semiconductor Equipment Market

The Semiconductor Equipment market appears to be slowly recovering from a cyclical downturn, which bottomed in 2023. Demand improved in 2024, but a number of external factors continue to limit the market recovery, including unfavorable macroeconomic conditions, prolonged weak demand for consumer electronics, low fab utilization, and U.S. export restrictions to China.

We continue to believe the long-term growth drivers will support cyclical growth for this market. Growth drivers include more manufacturing capacity needed to support increasing demand for semiconductor devices, increasing etch and deposition process steps with new technology inflections, and the transition to advanced technology nodes requiring higher content of advanced power solutions per tool. In addition, we believe our investment in new products can enable market share gains resulting in higher than market growth.

Industrial and Medical Market

Beginning in the second half of 2023, the impact of weaker macroeconomic conditions started to lower demand for our products in the Industrial and Medical market. In addition, in the previous two years, many customers built inventories of our products following the supply chain disruption and extended lead times. As lead times normalized in 2024, customers rebalanced their elevated inventory levels resulting in further decline in revenue. We expect these factors will continue to limit our revenue in the near term but believe that growth will return to this market after customer inventories return to normal levels and end markets recover.

Data Center Computing Market

Revenue in the Data Center Computing market was weak in the first quarter of 2024 driven by reduced investments by our hyperscale customers, lower demand for enterprise systems, and the timing of large customer orders. Starting in the second quarter of 2024, demand rebounded driven by accelerated investments in AI and customers starting to ramp new generations of high power solutions, resulting in revenue growth in 2024. We expect these factors will continue to support strong demand for the next few quarters.

Telecom and Networking Market

In 2023, improved supply of critical components drove a meaningful increase in revenue, which more than offset weakening market conditions in the Telecom and Networking market. End demand further weakened during 2024. In addition, customers rebalanced their elevated inventory levels as lead times normalized, resulting in a further decline in our revenue. We expect the current market conditions to continue for several quarters.

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 accounting principles generally accepted in the United States of America ("U.S. GAAP"). A reconciliation of the non-GAAP measures to U.S. GAAP is provided below.

The following table summarizes our Consolidated Statements of Operations and as a percentage of revenue:

	Years Ended December 31,		Change 2024 v. 2023	
	2024	2023	Dollar	Percent
	(in thousands)			
Revenue	$ 1,482,042	$ 1,655,810	$ (173,768)	(10.5)%
Gross profit	529,343	592,398	(63,055)	(10.6)%
Operating expenses	492,736	478,704	14,032	2.9 %
Operating income from continuing operations	36,607	113,694	(77,087)	(67.8)%
Interest income	42,860	27,092	15,768	58.2 %
Interest expense	(25,105)	(16,566)	(8,539)	51.5 %
Other income (expense), net	(1,985)	(1,759)	(226)	12.8 %
Income from continuing operations, before income tax	52,377	122,461	(70,084)	(57.2)%
Income tax benefit	(3,929)	(8,288)	4,359	(52.6)%
Income from continuing operations	$ 56,306	$ 130,749	$ (74,443)	(56.9)%

Revenue

The following tables summarize net revenue and percentages of revenue by markets:

	Years Ended December 31,				Change 2024 v. 2023	
	2024		2023		Dollar	Percent
	(in thousands)					
Semiconductor Equipment	$ 792,559	53.5 %	$ 743,794	44.9 %	$ 48,765	6.6 %
Industrial and Medical	316,177	21.3	474,449	28.7	(158,272)	(33.4)%
Data Center Computing	284,192	19.2	249,874	15.1	34,318	13.7 %
Telecom and Networking	89,114	6.0	187,693	11.3	(98,579)	(52.5)%
Total	$ 1,482,042	100.0 %	$ 1,655,810	100.0 %	$ (173,768)	(10.5)%

Total revenue decreased from the same period in the prior year due primarily to lower end demand and customer inventory rebalancing, resulting in lower demand in our Industrial and Medical and Telecom and Networking markets. The Semiconductor Equipment market modestly recovered from the cyclical trough in 2023, and revenue in the Data Center Computing market grew as hyperscale customers increased investments in AI.

Revenue by Market

Sales in the Semiconductor Equipment market increased $48.8 million, or 6.6%, to $792.6 million, as compared to $743.8 million in the prior year. The increase was primarily due to improved demand as we emerge from the cyclical trough in 2023.

Sales in the Industrial and Medical market decreased $158.3 million, or 33.4%, to $316.2 million, as compared to $474.4 million in the prior year. After a record year in 2023, the decrease was primarily due to lower end demand and customers working down their elevated inventories on shortened lead times following the supply chain disruption.

Sales in the Data Center Computing market increased $34.3 million, or 13.7%, to $284.2 million, as compared to $249.9 million in the prior year. The increase was due to accelerated hyperscale investments in AI and growing adoption of next generation high power solutions.

Sales in the Telecom and Networking market decreased $98.6 million, or 52.5%, to $89.1 million as compared to $187.7 million in the prior year. The decrease was due to the prior year benefiting from the improved supply of critical components. This enabled fulfillment of outstanding orders in 2023, which did not continue in 2024. In addition, we experienced a slow demand environment and inventory rebalancing at many of our customers, which we expect to continue.

Gross Profit and Gross Margin

	Years Ended December 31,		Change 2024 v. 2023	
	2024	2023	Dollar	Percent
	(in thousands)			
Gross profit	$ 529,343	$ 592,398	$ (63,055)	(10.6)%
Gross margin	35.7 %	35.8 %		

The decrease in gross profit was largely due to the decline in revenue, partially offset by reduction in manufacturing expenses. Gross margin declined mainly due to the impact of lower volume, largely offset by lower manufacturing, material, and other costs of 170 basis points and favorable mix of 150 basis points.

Operating Expenses

The following table summarizes our operating expenses:

	Years Ended December 31,		Change 2024 v. 2023	
	2024	2023	Dollar	Percent
	(in thousands)			
Research and development	$ 211,834	$ 202,439	$ 9,395	4.6 %
Selling, general, and administrative	224,538	221,034	3,504	1.6 %
Amortization of intangible assets	26,046	28,254	(2,208)	(7.8)%
Restructuring, asset impairments, and other charges	30,318	26,977	3,341	12.4 %
Total operating expenses	$ 492,736	$ 478,704	$ 14,032	2.9 %

Research and Development

Research and development expenses increased $9.4 million to $211.8 million, as compared to $202.4 million in the prior year. The increase is related to higher stock-based compensation expense as well as higher program and materials costs compared to the prior year. This was partially offset by lower variable compensation.

Selling, General and Administrative

Selling, general and administrative expenses increased $3.5 million to $224.5 million, as compared to $221.0 million in the prior year. The increase is primarily driven by higher stock-based compensation expense, partially offset by actions taken to control costs, including headcount reduction and lower variable compensation.

Amortization of Intangible Assets

Amortization expense decreased $2.2 million to $26.0 million, as compared to $28.3 million in the prior year. Certain intangible assets reached the end of their estimated useful life in the current year. This was partially offset by amortization of intangible assets acquired in the Airity acquisition. For additional information, see *Note 2. Acquisition* and *Note 11. Intangible Assets and Goodwill* in Part II, Item 8 “Financial Statements and Supplementary Data.”

Restructuring, Asset Impairments and Other Charges

In the third quarter of 2024, we approved further manufacturing consolidation initiatives, including the closure of our Zhongshan, China manufacturing facility. In connection with the 2024 Plan, we recorded a $29.6 million charge primarily associated with expected employment-related charges and facility exit costs. The amounts incurred as a result of the approved actions are estimates and actual results may differ, which could result in incremental restructuring charges in future periods. We anticipate the 2024 Plan will be substantially completed by the end of second quarter of 2025, with final activities expected to conclude in 2026.

For additional information about this and prior year restructuring plans, see *Note 12. Restructuring, Asset Impairments, and Other Charges* in Part II, Item 8 "Financial Statements and Supplementary Data."

Interest Income, Interest Expense, and Other Income (Expense), net

We experienced an increase in interest income on higher cash balances, due in part to proceeds from the issuance of the Convertible Notes in the third quarter of 2023, our ability to concentrate cash in investment accounts, and higher short term market interest rates.

Interest expense increased due to interest associated with the Convertible Notes and a higher interest rate on the portion of our Term Loan Facility subject to a variable interest rate. We prepaid in full the Term Loan Facility on September 9, 2024, and the interest rate swap contracts expired on September 10, 2024. Should we have future borrowings under our Term Loan Facility or Revolving Facility, those borrowings would be subject to a variable rate.

Other expense, net was $2.0 million in 2024, as compared to $1.8 million of expense in the prior year. Other expense, net consists primarily of foreign exchange gains and losses and other miscellaneous items. We had unrealized foreign exchange losses during the year 2024 compared to unrealized gains in the prior year. Additionally, in 2024, we incurred costs associated with foreign currency translation adjustments related to liquidated foreign operations and debt discount and fees associated with our Term Loan Facility prepayment. There were no such costs during the same periods in the prior year.

See *Note 18. Long-Term Debt* in Part II, Item 8 "Financial Statements and Supplementary Data" for information regarding our debt.

Income Tax Benefit

The following table summarizes tax benefit and the effective tax rate for our income from continuing operations:

	Years Ended December 31,	
	2024	2023
	(in thousands)	
Income from continuing operations, before income tax	$ 52,377	$ 122,461
Income tax benefit	$ (3,929)	$ (8,288)
Effective tax rate	(7.5)%	(6.8)%

Our effective tax rates differ from the U.S. federal statutory rate of 21% for the years ended December 31, 2024 and 2023, primarily due to the intercompany transfer of intellectual property among certain of our subsidiaries in 2024 and a valuation allowance release in 2023. Additionally, both 2024 and 2023 included the benefit of earnings in foreign jurisdictions which are subject to lower tax rates, as well as tax credits, partially offset by net U.S. tax on foreign operations.

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.

As of January 1, 2024, the Pillar II minimum global effective tax rate of 15% enacted by the Organization for Economic Cooperation and Development ("OECD") was effectuated. More than 140 countries agreed to enact the Pillar II global minimum tax. However, the timing of the implementation for each country varies. For the year ended December 31, 2024, we included an estimate of global minimum tax liability as a result of those countries where we conduct business that have adopted Pillar II. As countries continue to make revisions to their legislation and release additional guidance with respect to the global minimum tax, we continue to determine any potential impact in the countries in which we operate. The impact of these changes may have a material impact on our cash tax expense and tax rate.

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, and 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 prepared 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, amortization of intangible assets, and long-term unrealized foreign exchange gains and losses. In addition, we exclude discontinued operations and other non-recurring items such as acquisition-related costs, facility expansion and 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. Finally, non-GAAP results exclude one-time tax benefits and losses associated with changes in our legal entity structure or ownership of certain assets.

Reconciliation of non-GAAP measure
Operating expenses and operating income from continuing operations, excluding certain items

	Years Ended December 31,	
	2024	2023
	(in thousands)	
Gross profit from continuing operations, as reported	$ 529,343	$ 592,398
Adjustments to gross profit:		
Stock-based compensation	3,994	2,059
Facility expansion, relocation costs and other	4,421	2,334
Acquisition-related costs	(13)	238
Non-GAAP gross profit	537,745	597,029
Non-GAAP gross margin	36.3%	36.1%
Operating expenses from continuing operations, as reported	492,736	478,704
Adjustments:		
Amortization of intangible assets	(26,046)	(28,254)
Stock-based compensation	(41,946)	(28,942)
Acquisition-related costs	(5,965)	(4,026)
Facility expansion, relocation costs and other	(1,222)	(189)
Restructuring, asset impairments, and other charges	(30,318)	(26,977)
Non-GAAP operating expenses	387,239	390,316
Non-GAAP operating income	$ 150,506	$ 206,713
Non-GAAP operating margin	10.2%	12.5%

Reconciliation of non-GAAP measure
Income from continuing operations, excluding certain items

	Years Ended December 31,	
	2024	2023
	(in thousands)	
Income from continuing operations, less non-controlling interest, net of income tax	$ 56,306	$ 130,749
Adjustments:		
Amortization of intangible assets	26,046	28,254
Acquisition-related costs	5,952	4,264
Facility expansion, relocation costs, and other	5,643	2,523
Restructuring, asset impairments, and other charges	30,318	26,977
Unrealized foreign currency gain	(3,512)	(89)
Other costs included in other income (expense), net	2,812	(1,516)
Tax effect of non-GAAP adjustments, including certain discrete tax benefits	(19,563)	(31,303)
Non-GAAP income, net of income tax, excluding stock-based compensation	104,002	159,859
Stock-based compensation, net of tax	36,292	24,181
Non-GAAP income, net of income tax	$ 140,294	$ 184,040

Weighted-average common shares

	Years Ended December 31,	
	2024	2023
	(in thousands)	
Diluted weighted-average common shares outstanding	37,839	37,750

Reconciliation of non-GAAP measure
Per share earnings excluding certain items

	Years Ended December 31,	
	2024	2023
Diluted earnings per share from continuing operations, as reported	$ 1.49	$ 3.46
Add back:		
Per share impact of non-GAAP adjustments, net of tax	2.22	1.42
Non-GAAP earnings per share	$ 3.71	$ 4.88

Liquidity and Capital Resources

Liquidity

Adequate liquidity and cash generation are 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 continue to be our available cash, cash generated from operations, and available borrowing capacity under the Revolving Facility (refer to *Note 18. Long-Term Debt* in Part II, Item 8 "Financial Statements and Supplementary Data").

As of December 31, 2024, our cash and cash equivalents totaled $722.1 million, and our available funding under our Revolving Facility is $600.0 million. Additionally, we generated $132.9 million of cash flow from continuing operations in 2024. We believe our sources of liquidity will be adequate to meet anticipated debt service, share repurchase programs, and dividends. During the ordinary course of business, we evaluate our cash requirements and, if necessary, adjust our expenditures to reflect the current market conditions and our projected revenue and demand. Our capital expenditures are primarily directed towards manufacturing and operations and can materially influence our available cash for other initiatives.

In addition, we may seek additional debt or equity financing from time to time; however, such additional financing may not be available on acceptable terms, if at all.

Debt

On September 9, 2024, we used existing cash on hand to prepay the full $345.0 million outstanding principal balance under our Term Loan Facility. On the same date, we entered into an additional amendment to the Credit Agreement to increase the capacity on the Revolving Facility from $200.0 million to $600.0 million.

As of December 31, 2024, our only outstanding debt is the $575.0 million Convertible Notes, which mature on September 15, 2028 and carry a 2.5% interest rate.

The interest rate swap contracts previously entered into related to the Term Loan Facility expired on September 10, 2024. Should we have future borrowings under our Term Loan Facility or Revolving Facility, those borrowings would be subject to a variable rate.

As of December 31, 2024, no amounts were outstanding under the Revolving Facility, and we had $600.0 million in available funding.

In addition to the available capacity on the Revolving Facility, prior to the maturity date of the Credit Agreement, we may request an increase to the financing commitments in either the Term Loan Facility or Revolving Facility by an aggregate amount not to exceed $250.0 million. Any requested increase is subject to lender approval.

For more information see *Note 18. Long-Term Debt* in Part II, Item 8 "Financial Statements and Supplementary Data."

Dividends

During 2024, we paid quarterly cash dividends of $0.10 per share, totaling $15.4 million. We currently anticipate that a cash dividend of $0.10 per share will continue to be paid on a quarterly basis, although the declaration of any future cash dividend is at the discretion of the Board of Directors and will depend on our financial condition, results of operations, capital requirements, business conditions, and other factors.

Share Repurchases

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

	Years Ended December 31,		
	2024	2023	2022
	(in thousands, except per share amounts)		
Amount paid or accrued to repurchase shares	$ 1,770	$ 40,132	$ 26,635
Number of shares repurchased	19	378	356
Average repurchase price per share	$ 93.58	$ 105.74	$ 74.90

At December 31, 2024, the remaining amount authorized by the Board for future share repurchases was $197.4 million with no time limitation.

Cash Flows

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

	Years Ended December 31,	
	2024	2023
	(in thousands)	
Net cash from operating activities from continuing operations	$ 132,924	$ 212,925
Net cash used in operating activities from discontinued operations	(2,177)	(3,988)
Net cash from operating activities	130,747	208,937
Net cash used in investing activities	(73,541)	(64,751)
Net cash (used in) from financing activities	(377,093)	445,684
Effect of currency translation on cash and cash equivalents	(2,583)	(4,132)
Net change in cash and cash equivalents	(322,470)	585,738
Cash and cash equivalents, beginning of period	1,044,556	458,818
Cash and cash equivalents, end of period	$ 722,086	$ 1,044,556

Net Cash From Operating Activities

Net cash from operating activities from continuing operations was $132.9 million, a decrease of $80.0 million, compared to $212.9 million in the prior year. The decrease was primarily due to lower net income from continuing operations, primarily due to a decline in revenue. Additionally, during the current year, we had a significant use of cash for inventories due to a strategic inventory buildup. In addition, we had net cash usage related to accounts payable, accrued expenses, restructuring payments, and other liabilities.

Net Cash From Investing Activities

Net cash used in investing activities in 2024 was $73.5 million, an increase of $8.7 million, compared to $64.8 million in the prior year. The increase was primarily due to our acquisition of Airity for $13.8 million and continued capital investments in our Mexico and Thailand manufacturing facilities.

Net Cash From Financing Activities

Net cash used in financing activities in 2024 was $377.1 million, compared to a cash inflow of $445.7 million in the prior year. In 2024, we used existing cash on hand to make payments towards our Term Loan Facility for $355.0 million, including $10.0 million in principal payment made in the first half of the year and the September prepayment of the remaining $345.0 million outstanding principal balance, and repurchased common stock for $1.8 million. We do not have any scheduled debt maturities in the next twelve months.

During 2023, we received $561.1 million net proceeds from the issuance of long-term debt from our Convertible Note. In conjunction with the Convertible Note issuance, we also received $74.9 million proceeds from sale of warrants and made a $115.0 million payment for purchase of note hedges. We also repurchased $40.1 million of our common stock.

Critical Accounting Estimates

The preparation of consolidated financial statements and related disclosures in conformity with U.S. GAAP requires us to make judgments, assumptions, and estimates that affect the amounts reported. *Note 1. Summary of Operations and 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 policies and estimates require significant judgments and assumptions to be used in the preparation of the consolidated financial statements and actual results could differ materially from the amounts reported based on variability in factors affecting these estimates.

Inventories

We value inventories at the lower of cost or net realizable value, computed on a first-in, first-out basis. General market conditions, as well as our design activities, can cause certain products to become obsolete and we adjust our inventory carrying value for estimated excess and obsolescence equal to the difference between the cost of inventory and the estimated net realizable value based on projected end-user demand, which is determined by considering historical usage, customer orders and forecast, and qualitative considerations such as market and economic conditions. 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.

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 more likely than not realize the benefits of these deductible differences.

Due to uncertainties in any tax audit outcome, our estimates of the ultimate settlement of our unrecognized tax positions may change and the actual tax benefits may differ significantly from the estimates. 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.

For more details see Note 4. Income Taxes in Part II, Item 8 "Financial Statements and Supplementary Data."

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 intangible assets. 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**.**

Off-Balance Sheet Arrangements

As of December 31, 2024, we did not have any off-balance sheet arrangements pursuant to 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 is provided in *Note 4. Income Taxes*, *Note 14. Leases*, *Note 15. Employee Retirement Plans and Postretirement Benefits,* and *Note 18. Long-Term Debt*, respectively, in Part II, Item 8 "Financial Statements and Supplementary Data."

Recent Accounting Pronouncements

From time to time, updates to the Accounting Standards Codification are communicated through issuance of an Accounting Standards Update. 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 from the Financial Accounting Standards Board ("FASB") or other standards setting bodies, whether adopted or to be adopted, please review the information provided in *Note 1. Summary of Operations and 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 and Credit Agreement. We also have exposure to 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 revenue 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, Euro, South Korean Won, New Taiwan Dollar, Japanese Yen, Pound Sterling, and Chinese Yuan. We are subject to risks associated with revenue and purchasing activities and costs to operate that are denominated in currencies other than our functional currencies, such as the Singapore Dollar, Malaysian Ringgit, Mexican Peso, Philippine Peso, and Thai Baht. Historically, the impact of changes to these particular exchange rates has not been material to our operating results.

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

At the present time, a change in interest rates does not have an impact upon our future earnings and cash flow because our only outstanding debt is the Convertible Notes, which carry a fixed 2.5% interest rate. However, increases in interest rates could impact the decision to borrow under our Credit Agreement and our ability to refinance existing maturities or acquire additional debt on favorable terms.

For more information see *Note 18. Long-Term Debt* in Part II, Item 8 “Financial Statements and Supplementary Data.”

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm (PCAOB ID No. 42)	44
Consolidated Balance Sheets	48
Consolidated Statements of Operations	49
Consolidated Statements of Comprehensive Income	50
Consolidated Statements of Stockholders' Equity	51
Consolidated Statements of Cash Flows	52
Notes to Consolidated Financial Statements	53

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, 2024 and 2023, 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, 2024, 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, 2024 and 2023, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2024, 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, 2024, 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 February 18, 2025 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 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 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.

Inventory valuation

Description of the Matter

As more fully described in Notes 1 and 9 to the consolidated financial statements, the Company has inventories with a carrying value of $360.4 million as of December 31, 2024. The Company adjusts its inventory carrying value for estimated excess or obsolescence equal to the difference between the cost of inventory and the estimated net realizable value based on projected customer demand, which is determined by considering historical usage, customer orders and forecast, and qualitative considerations such as market and economic conditions.

Auditing management's inventory valuation was complex and involved judgment because a critical factor in determining excess and obsolete inventory requires management to determine projected customer demand, which could be impacted by future market and economic conditions.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of internal controls related to the Company's process for evaluating inventory valuation inclusive of controls related to the development of and management's review of the underlying data, including historical usage and the estimation of projected customer demand.

We evaluated certain inventories for excess or obsolescence by testing key inputs, including historical usage and projected customer demand, and by testing the completeness and accuracy of the underlying data supporting management's inventory valuation assessment. Specifically, we compared the Company's projected customer demand to historical sales and inventory usage. We assessed historical trends of management's estimates and performed analyses to evaluate management's excess and obsolete inventory estimates and underlying assumptions. We also performed a retrospective review of the prior year valuation assumptions, including inventory write-off history.

/s/ Ernst & Young LLP
We have served as the Company's auditor since 2019.
Denver, Colorado
February 18, 2025

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, 2024, 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, 2024, based on the COSO criteria.

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, 2024 and 2023, 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, 2024, and the related notes and our report dated February 18, 2025 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
February 18, 2025

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

	December 31, 2024	December 31, 2023
ASSETS		
Current assets:		
Cash and cash equivalents	$ 722,086	$ 1,044,556
Accounts receivable, net	265,315	282,430
Inventories	360,411	336,137
Other current assets	41,511	48,771
Total current assets	1,389,323	1,711,894
Property and equipment, net	185,604	167,665
Operating lease right-of-use assets	96,305	95,432
Other assets	155,269	136,448
Intangible assets, net	139,391	161,478
Goodwill	296,002	283,840
TOTAL ASSETS	$ 2,261,894	$ 2,556,757
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 143,502	$ 141,850
Accrued payroll and employee benefits	67,874	73,595
Other accrued expenses	73,552	66,662
Customer deposits and other	11,468	15,997
Current portion of long-term debt	—	20,000
Current portion of operating lease liabilities	17,826	17,744
Total current liabilities	314,222	335,848
Long-term debt, net	564,695	895,679
Operating lease liabilities	89,178	89,330
Defined employee benefit pension plan	49,555	49,135
Other long-term liabilities	37,534	42,583
Total liabilities	1,055,184	1,412,575
Deferred compensation	3,539	—
Commitments and contingencies (Note 17)		
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; 37,711 and 37,318 issued and outstanding at December 31, 2024 and December 31, 2023, respectively	38	37
Common stock associated with deferred compensation plan	(911)	—
Additional paid-in capital	189,144	148,300
Accumulated other comprehensive income (loss)	(11,784)	6,114
Retained earnings	1,026,684	989,731
Total stockholders' equity	1,203,171	1,144,182
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	$ 2,261,894	$ 2,556,757

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,		
	2024	2023	2022
Revenue, net	$ 1,482,042	$ 1,655,810	$ 1,845,422
Cost of revenue	952,699	1,063,412	1,169,916
Gross profit	529,343	592,398	675,506
Operating expenses:			
Research and development	211,834	202,439	191,020
Selling, general, and administrative	224,538	221,034	218,463
Amortization of intangible assets	26,046	28,254	26,114
Restructuring, asset impairments, and other charges	30,318	26,977	6,814
Total operating expenses	492,736	478,704	442,411
Operating income	36,607	113,694	233,095
Interest income	42,860	27,092	4,147
Interest expense	(25,105)	(16,566)	(7,325)
Other income (expense), net	(1,985)	(1,759)	11,824
Income from continuing operations, before income tax	52,377	122,461	241,741
Income tax provision (benefit)	(3,929)	(8,288)	39,850
Income from continuing operations	56,306	130,749	201,891
Loss from discontinued operations, net of income tax	(2,092)	(2,465)	(2,215)
Net income	$ 54,214	$ 128,284	$ 199,676
Income from continuing operations attributable to noncontrolling interest	-	-	16
Net income attributable to Advanced Energy Industries, Inc.	$ 54,214	$ 128,284	$ 199,660
Basic weighted-average common shares outstanding	37,476	37,480	37,463
Diluted weighted-average common shares outstanding	37,839	37,750	37,721
Earnings (loss) per share:			
Continuing operations:			
Basic earnings per share	$ 1.50	$ 3.49	$ 5.39
Diluted earnings per share	$ 1.49	$ 3.46	$ 5.35
Discontinued operations:			
Basic loss per share	$ (0.06)	$ (0.07)	$ (0.06)
Diluted loss per share	$ (0.06)	$ (0.07)	$ (0.06)
Net income:			
Basic earnings per share	$ 1.45	$ 3.42	$ 5.33
Diluted earnings per share	$ 1.43	$ 3.40	$ 5.29

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

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

	Years Ended December 31,		
	2024	2023	2022
Net income	$ 54,214	$ 128,284	$ 199,676
Other comprehensive income (loss), net of income tax			
Foreign currency translation	(11,541)	2,027	(10,543)
Cash flow hedges	(5,474)	(6,374)	9,741
Defined employee benefit plan	(883)	(5,859)	18,338
Comprehensive income	36,316	118,078	217,212
Comprehensive income attributable to noncontrolling interest	—	—	16
Comprehensive income attributable to Advanced Energy Industries, Inc.	$ 36,316	$ 118,078	$ 217,196

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							
	Common Stock							
	Shares	Amount	Common Stock Associated with Deferred Compensation Plan	Additional Paid-in Capital	Accumulated Other Comprehensive Income (loss)	Retained Earnings	Non-controlling Interest	Total Stockholders' Equity
Balances, December 31, 2021	37,589	$ 38	—	$ 115,706	$ (1,216)	$ 756,323	$ 645	$ 871,496
Stock issued from equity plans, net	196	—	—	(26)	—	—	—	(26)
Stock-based compensation	—	—	—	19,624	—	—	—	19,624
Share repurchases	(356)	(1)	—	(1,125)	—	(25,509)	—	(26,635)
Dividends declared ($0.10 per share)	—	—	—	—	—	(15,204)	—	(15,204)
Other comprehensive income	—	—	—	—	17,536	—	—	17,536
Acquisition of non-controlling interest	—	—	—	461	—	—	(661)	(200)
Net income	—	—	—	—	—	199,660	16	199,676
Balances, December 31, 2022	37,429	37	—	134,640	16,320	915,270	—	1,066,267
Stock issued from equity plans, net	267	1	—	(80)	—	—	—	(79)
Stock-based compensation	—	—	—	29,314	—	—	—	29,314
Share repurchases	(378)	(1)	—	(1,530)	—	(38,601)	—	(40,132)
Dividends declared ($0.10 per share)	—	—	—	—	—	(15,222)	—	(15,222)
Other comprehensive loss	—	—	—	—	(10,206)	—	—	(10,206)
Warrants and note hedges, net	—	—	—	(40,135)	—	—	—	(40,135)
Tax impact of convertible notes and note hedges	—	—	—	26,091	—	—	—	26,091
Net income	—	—	—	—	—	128,284	—	128,284
Balances, December 31, 2023	37,318	37	—	148,300	6,114	989,731	—	1,144,182
Stock issued from equity plans, net	268	—	—	(4,849)	—	—	—	(4,849)
Stock issuance (Note 2)	144	1	—	4,463	—	—	—	4,464
Stock-based compensation	—	—	—	43,384	—	—	—	43,384
Share repurchases	(19)	—	—	(89)	—	(1,681)	—	(1,770)
Dividends declared ($0.10 per share)	—	—	—	—	—	(15,369)	—	(15,369)
Other comprehensive loss	—	—	—	—	(17,898)	—	—	(17,898)
Deferred compensation	—	—	—	(2,065)	—	(211)	—	(2,276)
Common stock issued to deferred compensation plan (9,487 shares)	—	—	(911)	—	—	—	—	(911)
Net income	—	—	—	—	—	54,214	—	54,214
Balances, December 31, 2024	37,711	$ 38	$ (911)	$ 189,144	$ (11,784)	$ 1,026,684	$ —	$ 1,203,171

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,		
	2024	**2023**	**2022**
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net income	$ 54,214	$ 128,284	$ 199,676
Less: loss from discontinued operations, net of income tax	(2,092)	(2,465)	(2,215)
Income from continuing operations, net of income tax	56,306	130,749	201,891
Adjustments to reconcile net income to net cash from operating activities:			
Depreciation and amortization	68,455	66,533	60,296
Stock-based compensation	45,940	31,001	19,849
Amortization and write off of debt issuance costs and debt discount	3,771	1,330	547
Deferred income tax benefit	(20,505)	(33,940)	(5,736)
Other	1,165	439	(3,962)
Changes in operating assets and liabilities, net of assets acquired			
Accounts receivable, net	14,622	23,282	(59,630)
Inventories	(27,899)	39,300	(32,244)
Other assets	(2,134)	5,015	(19,673)
Accounts payable	(558)	(26,080)	(28,703)
Operating lease right-of-use assets and operating lease liabilities, net	(943)	588	1,800
Other liabilities and accrued expenses	(5,296)	(25,292)	49,296
Net cash from operating activities from continuing operations	132,924	212,925	183,731
Net cash from operating activities from discontinued operations	(2,177)	(3,988)	(144)
Net cash from operating activities	130,747	208,937	183,587
CASH FLOWS FROM INVESTING ACTIVITIES:			
Purchases of long-term investments	(2,991)	(3,746)	—
Purchases of property and equipment	(56,788)	(61,005)	(58,885)
Acquisitions, net of cash acquired	(13,762)	—	(149,387)
Net cash from investing activities	(73,541)	(64,751)	(208,272)
CASH FLOWS FROM FINANCING ACTIVITIES:			
Proceeds from long-term borrowings	—	575,000	—
Payment of fees for long-term borrowings	(105)	(13,880)	—
Payments on long-term borrowings	(355,000)	(20,000)	(20,000)
Dividend payments	(15,369)	(15,222)	(15,204)
Payment for purchase of note hedges	—	(115,000)	—
Proceeds from sale of warrants	—	74,865	—
Purchase and retirement of common stock	(1,770)	(40,000)	(26,635)
Net payments related to stock-based awards	(4,849)	(79)	(26)
Net cash from financing activities	(377,093)	445,684	(61,865)
EFFECT OF CURRENCY TRANSLATION ON CASH AND CASH EQUIVALENTS	(2,583)	(4,132)	996
NET CHANGE IN CASH AND CASH EQUIVALENTS	(322,470)	585,738	(85,554)
CASH AND CASH EQUIVALENTS, beginning of period	1,044,556	458,818	544,372
CASH AND CASH EQUIVALENTS, end of period	$ 722,086	$ 1,044,556	$ 458,818

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

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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

Advanced Energy Industries, Inc., a Delaware corporation, and its consolidated subsidiaries ("we," "us," "our," "Advanced Energy," or the "Company") provides highly engineered, 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. Many of our products enable customers to reduce or optimize their energy consumption through increased power conversion efficiency, power density, power coupling, and process control across a wide range of applications.

In December 2015, we completed the wind down of engineering, manufacturing, and sales of our solar inverter product line. We have continuing involvement with regard to certain warranty obligations. Accordingly, the results of our inverter business are reflected as loss from discontinued operations, net of income taxes on our Consolidated Statements of Operations.

Principles of Consolidation

Our consolidated financial statements include the Company and its 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").

Reclassifications

We reclassified certain prior period amounts to conform to the current year presentation. Within the operating activities section of our Consolidated Statements of Cash Flows, we present activity associated with our operating leases separately in the caption "Operating lease right-of-use assets and operating lease liabilities, net." Additionally, we separately present "Amortization and write-off of debt issuance costs and debt discount." Previously the above activity was included within "Other liabilities and accrued expenses."

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, income taxes and other provisions, and acquisitions and asset valuation.

Segment Information

Our Chief Executive Officer ("CEO") is the chief operating decision maker who reviews financial information on a consolidated basis for purposes of allocating resources and evaluating financial performance. Accordingly, we determined we operate in a single reporting segment – power electronics conversion products. Within this segment, our products are sold into the Semiconductor Equipment, Industrial and Medical, Data Center Computing, and Telecom and Networking markets.

Our CEO assesses performance and decides how to allocate resources primarily based on consolidated net income, which is reported on our Consolidated Statements of Operations. Total assets on the Consolidated Balance Sheets represent our segment assets.

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.

Derivatives

We use derivative financial instruments to manage risks associated with foreign currency. 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.

Fair Value

We value certain 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.

We have various assets and liabilities measured at fair value on a recurring basis, including:

Category of Asset or Liability	Fair Value Hierarchy	Methodology for Estimating Fair Value
Certificates of deposit and investments	Level 2	Observable market data for similar assets
Foreign currency forward contracts	Level 2	Forecasted movement in the forward rates of foreign currency for the applicable duration in which the hedging instrument is denominated
Deferred compensation liability	Level 2	Observable market data for participants' notional funds
Pension benefit obligations	Level 2	Actuarial analysis, which includes various estimates and assumptions including, but not limited to, discount rates, expected return on plan assets, and future inflation rates

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, operating lease right-of-use assets, 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 11. Intangible Assets and Goodwill* for further discussion and presentation of these amounts.

Cash and Cash Equivalents

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.

In some instances, we invest excess cash in money market funds not insured by the Federal Deposit Insurance Corporation. 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 classify investments with stated maturities of greater than three months at time of purchase in other current assets on the Consolidated Balance Sheets.

Concentrations of Credit Risk

Financial instruments with potential credit risk include cash and cash equivalents 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.

Allowance for Credit Losses

We evaluate collection risk and establish expected credit loss primarily through a combination of the following: continuous monitoring of customer credit, analysis of historical aging and credit loss experience, current economic conditions, and customer specific information.

Our standard payment terms are net 30 days. Certain large volume customers have longer payment terms. Generally, we do not require collateral from customers.

Inventories

We value inventories at the lower of cost or net realizable value, computed on a first-in, first-out basis. General market conditions, as well as our design activities, can cause certain products to become obsolete and we adjust our inventory carrying value for estimated excess and obsolescence equal to the difference between the cost of inventory and the estimated net realizable value based on projected end-user demand, which is determined by considering historical usage, customer orders and forecast, and qualitative considerations such as market and economic conditions. 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. We compute depreciation over the estimated useful lives using the straight-line method. Additions and improvements are capitalized, while maintenance and repairs are expensed as incurred. We evaluate the useful life and test for impairment whenever events or changes in circumstances indicate the carrying amount of an asset group containing the property and equipment may not be recoverable.

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.

Internal-Use Software Development Costs

We capitalize qualifying costs associated with software applications developed for internal use. We begin capitalization after meeting two criteria: (i) the preliminary project stage is completed and (ii) it is probable that the software will be completed and used for its intended function. We also capitalize costs related to specific upgrades and enhancements when it is probable the expenditures will result in significant additional functionality. We cease capitalization when the software is substantially complete and ready for its intended use, including the completion of all significant testing.

Costs related to preliminary project activities, post-implementation operating activities, maintenance, and minor upgrades are expensed as incurred.

We classify capitalized software development costs within property and equipment, net and other assets on the Consolidated Balance Sheets. These costs are amortized on a straight-line basis over the software's estimated useful life. Amortization is included in both cost of revenue and operating expenses. We evaluate the useful life and test for impairment whenever events or changes in circumstances indicate the carrying amount may not be recoverable.

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.

We evaluate the useful life and test for impairment whenever events or changes in circumstances indicate the carrying amount of an asset group containing the right-of-use assets may not be recoverable.

Intangible Assets and Goodwill

Our intangible assets consist of customer relationships, developed technology, trademarks, patents, and intellectual property, which are stated at cost less accumulated amortization. Intangible assets, which are considered long-lived assets, are amortized over their estimated useful lives and reviewed for impairment when events or changes in circumstances indicate that the carrying amount of an asset group containing these assets may not be recoverable.

Goodwill represents the excess of the purchase price over the fair value of the identifiable net assets acquired in a business combination. We evaluate goodwill for impairment as a single reporting unit annually during the fourth quarter or when events or changes in circumstances indicate the carrying value may not be recoverable.

Our goodwill impairment evaluation consists of a qualitative assessment. If this assessment indicates it is more likely than not that the Company's estimated fair value exceeds the carrying value of our net assets, we do not consider goodwill to be impaired. Otherwise, we perform a quantitative assessment by comparing the Company's fair value to the carrying value of our net assets, including goodwill. If the carrying value of our net assets exceeds the fair value, we consider goodwill to be impaired.

Based on the facts and circumstances, we determine the fair value based on an income, market, or cost approach. Each method is subjective in nature and involves the use of significant estimates and assumptions, which can include projected financial results, discount rates, long-term growth rates, and industry trends.

Debt Issuance Costs

We capitalize costs associated with issuing debt. Depending on the nature of the agreement, we record these costs on the Consolidated Balance Sheets either in other assets or as a direct deduction from the carrying amount of the debt. We amortize the costs over the term of the agreement using the effective interest method. Amortization expense is reflected within interest expense on the Consolidated Statements of Operations. See *Note 18. Long-Term Debt* for additional details.

Revenue Recognition

Net revenue consists of products and support services.

We recognize substantially all revenue at a point in time when we satisfy our performance obligations. Typically, this occurs on shipment of goods 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. We recognize revenue 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 revenue.

Support services include warranty and non-warranty repair services, upgrades, and refurbishments on the products we sell. Repairs covered under our standard warranty do not generate revenue. We recognize substantially all non-warranty revenue upon completion of the service because that is the point in time when we satisfy our performance obligation.

As part of our ongoing service business, we satisfy our service obligations under preventative maintenance contracts and extended warranties. Up-front fees received for extended warranties or maintenance plans are deferred and recorded in customer deposits and other on the Consolidated Balance Sheets. Revenue under these arrangements is recognized ratably over the underlying terms, as we do not have historical information that would allow us to project the estimated service usage pattern at this time.

We expense the 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.

Our remaining performance obligations primarily relate to customer purchase orders for products we have not yet shipped. We expect to fulfill the majority of these performance obligations within one year.

Research and Development Expenses

Costs incurred to advance, test, or otherwise modify our 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.

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 value at the grant date.

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 on a straight-line basis over the requisite service period. For awards with a performance-based vesting condition, we record stock-based compensation expense (based on our assessment of the probability of meeting the performance conditions) over the estimated period to achieve the performance conditions. If the awards are forfeited, we reverse the stock-based compensation expense.

Certain RSUs vest based on a market condition. Our stock-based compensation expense is based on an estimate of the fair value and probability of achievement for each tranche of these awards using a Monte Carlo simulation. For these RSUs, we recognize stock-based compensation expense over each tranche's estimated achievement period even if some or all of the shares never vest.

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 more likely than not realize the benefits of these deductible differences.

Accounting for income taxes requires a two-step approach to recognize and measure uncertain tax positions. 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 that the tax is incurred as a period expense only. We have elected to account for GILTI in the year that the tax is incurred.

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 intellectual property 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 intellectual property 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 such 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.

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 November 2023, the FASB issued ASU 2023-07 "Segment Reporting (Topic 280) Improvements to Reportable Segment Disclosures." The amendments in ASU 2023-07 expand disclosure requirements. In addition, the ASU enhances interim disclosures, clarifies circumstances in which an entity can disclose multiple segment measures of profit or loss, and provides new disclosures requirements for entities with a single reportable segment. We adopted this guidance on December 31, 2024, and it was not material to our consolidated financial statements.

New Accounting Standards Issued But Not Yet Adopted

In December 2023, the FASB issued ASU 2023-09 "Improvements to Income Tax Disclosures." ASU 2023-09 requires disaggregated information about a reporting entity's effective tax rate reconciliation as well as additional disclosure on income taxes paid. This guidance will be effective for us on January 1, 2025 for annual disclosures. We do not expect the above guidance to materially impact our consolidated financial statements.

In March 2024, the SEC issued climate-related disclosure rules. These rules do not change accounting treatment, but they significantly expand the climate-related information companies are required to disclose. Several petitions were filed challenging these climate-related disclosure rules and, in April 2024, the SEC voluntarily stayed the rules, pending completion of judicial review. Disclosure requirements, absent the results of pending legal challenges, may begin phasing in with our annual reporting for the year ending December 31, 2025. We do not expect the above disclosure requirement to materially impact our consolidated financial statements. We are evaluating the disclosure requirements and changes to our business processes, systems, and controls to support the additional disclosures.

In November 2024, the FASB issued ASU 2024-03 final standard on Income Statement: Disaggregation of Income Statement Expenses, which requires disaggregated disclosure of income statement expenses for public business entities. The ASU does not change the expense captions an entity presents on the face of the income statement; rather, it requires disaggregation of certain expense captions into specified categories in disclosures within the footnotes to the financial statements. This guidance will be effective for us on January 1, 2027. We do not expect the above guidance to materially impact our consolidated financial statements.

NOTE 2. ACQUISITION

On June 20, 2024, we acquired 100% of the issued and outstanding shares of capital stock of Airity Technologies, Inc. ("Airity"). We accounted for this transaction as a business combination. This acquisition added high voltage power conversion technologies and products, broadening our range of targeted applications within the Semiconductor Equipment and Industrial and Medical markets.

The following table summarizes the consideration paid:

	Consideration
	(in thousands)
Cash paid at closing	$ 14,301
Advanced Energy common stock	4,463
Settlement of payables	(654)
Indemnity holdback payable on the one-year anniversary	1,500
Total fair value of purchase consideration	$ 19,610

We allocated the purchase price consideration to the assets acquired and liabilities assumed based on their estimated fair values as of the acquisition date, with the excess allocated to goodwill. The following represents the final purchase price allocation.

	Fair Value
	(in thousands)
Cash	$ 539
Current assets and liabilities, net	457
Property and equipment	42
Deferred tax liability	(1,748)
Intangible assets	4,200
Goodwill (not deductible for tax purposes)	16,120
Total fair value of net assets acquired	$ 19,610

We included Airity's results of operations in our consolidated financial statements from the date of acquisition, which were not material.

In connection with the acquisition, we entered into agreements with certain former Airity employees. On the closing date, these individuals received a total of 0.1 million shares of Advanced Energy common stock valued at $15.6 million based on the June 20, 2024 closing price, of which $4.5 million was allocated to purchase consideration and $11.1 million will be future compensation. We will record the $11.1 million as stock-based compensation expense over the three-year expected vesting period. *See Note 16. Stock-based Compensation*.

NOTE 3. REVENUE

Disaggregation of Revenue

The following tables present additional information regarding our revenue:

Revenue by Market

	Years Ended December 31,		
	2024	2023	2022
	(in thousands)		
Semiconductor Equipment	$ 792,559	$ 743,794	$ 930,809
Industrial and Medical	316,177	474,449	426,763
Data Center Computing	284,192	249,874	327,466
Telecom and Networking	89,114	187,693	160,384
Total	$ 1,482,042	$ 1,655,810	$ 1,845,422

Revenue by Region

	Years Ended December 31,					
	2024		2023		2022	
	(in thousands)					
North America	$ 669,946	45.1 %	$ 724,481	43.8 %	$ 857,490	46.5 %
Asia	661,854	44.7	713,571	43.1	754,997	40.9
Europe	147,560	10.0	212,368	12.8	219,119	11.9
Other	2,682	0.2	5,390	0.3	13,816	0.7
Total	$ 1,482,042	100.0 %	$ 1,655,810	100.0 %	$ 1,845,422	100.0 %

Revenue by Significant Countries

	Years Ended December 31,					
	2024		2023		2022	
	(in thousands)					
United States	$ 508,713	34.3 %	$ 598,359	36.1 %	$ 723,564	39.2 %
Mexico	160,063	10.8	123,466	7.5	132,313	7.2
Taiwan	159,587	10.8	124,216	7.5	112,252	6.1
China	109,883	7.4	165,940	10.0	180,355	9.8
All others	543,796	36.7	643,829	38.9	696,938	37.7
Total	$ 1,482,042	100.0 %	$ 1,655,810	100.0 %	$ 1,845,422	100.0 %

We attribute revenue to individual countries and regions based on the customer's ship to location. Aside from the specific countries listed above, no individual country exceeded 10% of our total consolidated revenues during the periods presented.

Revenue by Category

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Product	$ 1,315,723	$ 1,484,007	$ 1,686,053
Services and other	166,319	171,803	159,369
Total	$ 1,482,042	$ 1,655,810	$ 1,845,422

Other revenue includes certain spare parts and products sold by our service group.

Significant Customers

During the year ended December 31, 2024, Applied Materials, Inc. and Lam Research Corporation accounted for 26% and 11%, respectively, of our total revenue. During the year ended December 31, 2023, Applied Materials, Inc. accounted for 22% of our total revenue. During the year ended December 31, 2022, Applied Materials Inc. and Lam Research Corporation accounted for 20% and 14%, respectively, of our total revenue.

As of December 31, 2024, the account receivable balance from Applied Materials, Inc. and Lam Research Corporation accounted for 25% and 14%, respectively, of our total accounts receivable. During the year ended December 31, 2023, Applied Materials, Inc. accounted for 26% of our total accounts receivable. No other customer's account receivable exceeded 10% of our total accounts receivable in the periods presented.

NOTE 4. INCOME TAXES

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

	Years Ended December 31,		
	2024	2023	2022
	(in thousands)		
Domestic	$ (43,223)	$ (17,458)	$ 5,969
Foreign	95,600	139,919	235,772
Income from continuing operations, before income taxes	$ 52,377	$ 122,461	$ 241,741

The income tax provision (benefit) from continuing operations is summarized as follows:

	Years Ended December 31,		
	2024	2023	2022
	(in thousands)		
Current:			
Federal	$ 3,760	$ 13,402	$ 23,370
State	459	589	1,949
Foreign	12,357	11,661	20,267
Total current provision	16,576	25,652	45,586
Deferred:			
Federal	(1,444)	(5,455)	(6,742)
State	(61)	(955)	(1,030)
Foreign	(19,000)	(27,530)	2,036
Total deferred benefit	(20,505)	(33,940)	(5,736)
Total income tax provision (benefit)	$ (3,929)	$ (8,288)	$ 39,850
Effective tax rate	(7.5)%	(6.8)%	16.5 %

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,		
	2024	2023	2022
	(in thousands)		
Income taxes per federal statutory rate	$ 10,999	$ 25,850	$ 50,766
State income taxes, net of federal deduction	302	(490)	510
U.S. tax on foreign operations	18,944	20,451	28,726
Foreign derived intangible income deduction	(1,423)	(2,868)	(6,259)
Tax effect of foreign operations	(14,934)	(27,959)	(28,432)
Uncertain tax positions	(1,101)	1,291	1,080
Change in valuation allowance assessment	616	(25,636)	—
Tax credits	(7,805)	(7,289)	(5,857)
Change in valuation allowance	3,616	12,927	268
Executive compensation limitation	2,348	1,955	641
Impact of intellectual property transfer	(22,950)	—	—
Other permanent items, net	7,459	(6,520)	(1,593)
Total income tax provision (benefit)	$ (3,929)	$ (8,288)	$ 39,850

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:

	December 31, 2024	December 31, 2023
	(in thousands)	
Deferred tax assets:		
Net operating loss and tax credit carryforwards	$ 72,027	$ 73,954
Pension obligation	9,206	9,960
Bond hedge original issue discount	20,168	24,755
Amortization	43,011	23,609
Operating lease liabilities	12,253	12,054
Other	56,424	43,782
Total deferred tax assets	213,089	188,114
Less: valuation allowance	(42,355)	(37,999)
Deferred tax assets, net of valuation allowance	170,734	150,115
Deferred tax liabilities:		
Depreciation	2,545	3,826
Amortization	26,802	28,853
Unremitted earnings	2,821	3,277
Operating lease right-of-use assets	9,862	9,520
Operating lease liability	5,265	1,069
Other	2,650	3,038
Total deferred tax liabilities	49,945	49,583
Net deferred tax assets	$ 120,789	$ 100,532

Of the $120.8 million and $100.5 million net deferred tax assets as of December 31, 2024 and 2023, respectively, $121.4 million and $107.9 million, respectively, were included as a net non-current deferred tax asset within other assets on the Consolidated Balance Sheets. $0.6 million and $7.4 million, respectively, were included as a net non-current deferred tax liability within other long-term liabilities on the Consolidated Balance Sheets.

During the fourth quarter of 2024, we completed the transfer of certain intellectual property between certain of our legal entities in connection with simplifying our corporate legal entity structure. The tax impact of the transfer resulted in the recognition of deferred tax assets totaling approximately $23.0 million with a corresponding decrease to tax expense.

As of December 31, 2024, we have recorded a total valuation allowance on $2.9 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 $39.4 million and is associated primarily with operations in Hong Kong, Germany, China, and Switzerland. As of December 31, 2024, there is not sufficient positive evidence to conclude that such deferred tax assets, presently reduced by a valuation allowance, will more likely than not be recognized. The December 31, 2024 valuation allowance balance reflects an increase of $4.4 million during the year.

As of December 31, 2024, we had U.S., foreign and state tax loss carryforwards of $31.3 million, $277.7 million, and $107.2 million, respectively. Additionally, we had $1.6 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 $0.1 million and $2.3 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 loss carryforwards, and $9.7 million of the federal net operating loss carry forwards, have no expiration period.

We operate under a tax holiday in Singapore, China, and Malaysia. These tax holidays are in effect through June 30, 2027, December 31, 2025, and January 31, 2025, respectively. The tax holidays are conditional upon our meeting certain employment and investment thresholds. The expected benefit of these tax holidays may be limited by the impact of Pillar II global minimum tax or other actions taken by these countries. For the years ended December 31, 2024, 2023 and 2022, the impact of the tax holidays decreased foreign taxes by $12.4 million, $14.3 million, and $19.4 million, respectively, and the benefit on earnings per diluted share was $0.33, $0.38, and $0.52, respectively.

As of December 31, 2024, we have undistributed earnings in certain foreign subsidiaries of approximately $36.3 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 consolidated financial statements. The following table provides a reconciliation of our total gross unrecognized tax benefits, which we include within other long-term liabilities on the Consolidated Balance Sheets:

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Balance at beginning of period	$ 8,452	$ 7,467	$ 5,513
Additions based on tax positions taken during a prior period	—	199	245
Additions based on tax positions taken during a prior period - acquisitions	—	—	1,025
Additions based on tax positions taken during the current period	536	1,070	836
Reductions based on tax positions taken during a prior period	(2,102)	—	—
Reductions related to a lapse of applicable statute of limitations	(1,151)	(139)	(152)
Reductions related to a settlement with taxing authorities	—	(145)	—
Balance at end of period	$ 5,735	$ 8,452	$ 7,467

The unrecognized tax benefits of $5.7 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 $0.8 million and $0.7 million of accrued interest and penalties on December 31, 2024 and 2023, respectively. With few exceptions, we are no longer subject to federal, state, or foreign income tax examinations by tax authorities for years before 2020.

As of January 1, 2024, the Pillar II minimum global effective tax rate of 15% enacted by the Organization for Economic Cooperation and Development (“OECD”) was effectuated. More than 140 countries agreed to enact the Pillar II global minimum tax. However, the timing of the implementation for each country varies. For the year ended December 31, 2024, we included an estimate of global minimum tax liability as a result of those countries where we conduct business that have adopted Pillar II. As countries continue to make revisions to their legislation and release additional guidance with respect to the global minimum tax, we continue to determine any potential impact in the countries in which we operate. The impact of these changes may have a material impact on our cash tax expense and tax rate.

NOTE 5. STOCKHOLDERS' EQUITY AND EARNINGS PER SHARE

Accumulated Other Comprehensive Income (Loss)

The following table summarizes the components of, and changes in, accumulated other comprehensive income (loss), net of income taxes.

	Foreign Currency Translation	Change in Fair Value of Cash Flow Hedges	Defined Employee Benefit Plan	Total
	(in thousands)			
Balance at December 31, 2021	$ (2,280)	$ 2,107	$ (1,043)	$ (1,216)
Other comprehensive income (loss) prior to reclassifications	(10,543)	12,625	18,016	20,098
Amounts reclassified from accumulated other comprehensive income	-	(2,884)	322	(2,562)
Balance at December 31, 2022	(12,823)	11,848	17,295	16,320
Other comprehensive income (loss) prior to reclassifications	2,027	4,502	(5,455)	1,074
Amounts reclassified from accumulated other comprehensive income	-	(10,876)	(404)	(11,280)
Balance at December 31, 2023	(10,796)	5,474	11,436	6,114
Other comprehensive income (loss) prior to reclassifications	(13,126)	2,244	(673)	(11,555)
Amounts reclassified from accumulated other comprehensive loss	1,585	(7,718)	(210)	(6,343)
Balance at December 31, 2024	$ (22,337)	$ —	$ 10,553	$ (11,784)

Amounts reclassified from accumulated other comprehensive income (loss) to the specific caption within the Consolidated Statements of Operations were as follows:

	Years Ended December 31,			To Caption on Consolidated Statements of Operations
	2024	2023	2022	
	(in thousands)			
Foreign currency translation	$ 1,585	$ —	$ —	Other income (expense), net
Cash flow hedges	(7,718)	(10,876)	(2,884)	Interest expense
Defined employee benefit plan	(210)	(404)	322	Other income (expense), net
Total reclassifications	$ (6,343)	$ (11,280)	$ (2,562)	

Earnings Per Share

The following table summarizes our earnings per share ("EPS"):

	Years Ended December 31,		
	2024	2023	2022
	(in thousands, except per share amounts)		
Income from continuing operations	$ 56,306	$ 130,749	$ 201,891
Less: income from continuing operations attributable to noncontrolling interest	—	—	16
Income from continuing operations attributable to Advanced Energy Industries, Inc.	$ 56,306	$ 130,749	$ 201,875
Basic weighted-average common shares outstanding	37,476	37,480	37,463
Dilutive effect of stock awards	363	270	258
Diluted weighted-average common shares outstanding	37,839	37,750	37,721
EPS from continuing operations			
Basic EPS	$ 1.50	$ 3.49	$ 5.39
Diluted EPS	$ 1.49	$ 3.46	$ 5.35
Anti-dilutive shares not included above			
Stock awards	-	95	67
Warrants	3,046	3,486	—
Total anti-dilutive shares	3,046	3,581	67

We compute basic earnings per share of common stock ("Basic EPS") by dividing income available to common stockholders by the weighted-average number of common shares outstanding during the period.

See *Note 18. Long-Term Debt* for information regarding our Convertible Notes, Note Hedges, and Warrants. For diluted earnings per share of common stock ("Diluted EPS"), we increase the weighted-average number of common shares outstanding during the period, as needed, to include the following:

- Additional common shares that would have been outstanding if our outstanding stock awards had been converted to common shares using the treasury stock method. We exclude any stock awards that have an anti-dilutive effect;
- Dilutive impact associated with the Convertible Notes using the if-converted method. The Convertible Notes are repayable in cash up to par value and in cash or shares of common stock for the excess over par value. When the stock price is lower than the strike price, there is no dilutive or anti-dilutive impact. Prior to conversion, we do not consider the Note Hedges for purposes of Diluted EPS as their effect would be anti-dilutive. Upon conversion, we expect the Note Hedges to offset the dilutive effect of the Convertible Notes when the stock price is above $137.46 but below $179.76; and
- Dilutive effect of the Warrants issued concurrently with the Convertible Notes using the treasury stock method. For all periods presented, the Warrants did not increase the weighted-average number of common shares outstanding because the $179.76 exercise price of the Warrants exceeded the average market price of our common stock.

Share Repurchases

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

	Years Ended December 31,		
	2024	2023	2022
	(in thousands, except per share amounts)		
Amount paid or accrued to repurchase shares	$ 1,770	$ 40,132	$ 26,635
Number of shares repurchased	19	378	356
Average repurchase price per share	$ 93.58	$ 105.74	$ 74.90

There were no shares repurchased from related parties. Repurchased shares were retired and assumed the status of authorized and unissued shares.

At December 31, 2024, the remaining amount authorized by the Board of Directors ("our Board" or "the Board") for future share repurchases was $197.4 million with no time limitation.

NOTE 6. FAIR VALUE MEASUREMENTS

Refer to *Note 15. Employee Retirement Plans and Post Retirement Benefits* for information on fair value of our pension asset and liabilities. The following tables present information about our non-pension assets and liabilities measured at fair value on a recurring basis:

		December 31, 2024			
Description	Balance Sheet Classification	Level 1	Level 2	Level 3	Total Fair Value
		(in thousands)			
Certificates of deposit	Other current assets	$ —	$ 211	$ —	$ 211
Foreign currency forward contracts	Other accrued expenses	$ —	$ 311	$ —	$ 311
Investments	Other assets	$ —	$ 9,895	$ —	$ 9,895
Deferred compensation liabilities	Other long-term liabilities	$ —	$ 10,135	$ —	$ 10,135

		December 31, 2023			
Description	Balance Sheet Classification	Level 1	Level 2	Level 3	Total Fair Value
		(in thousands)			
Certificates of deposit	Other current assets	$ —	$ 163	$ —	$ 163
Interest rate swaps	Other assets	$ —	$ 6,995	$ —	$ 6,995
Investments	Other assets	$ —	$ 5,952	$ —	$ 5,952
Deferred compensation liabilities	Other long-term liabilities	$ —	$ 6,068	$ —	$ 6,068

NOTE 7. DERIVATIVE FINANCIAL INSTRUMENTS

Changes in foreign currency exchange rates impact our results of operations and cash flows. 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. Typically, we execute these derivative instruments for one-month periods and do not designate them as hedges for accounting purposes; however, they do partially offset the economic fluctuations of certain of our assets and liabilities due to foreign exchange rate changes. The gains and losses related to these foreign currency exchange contracts are intended to offset the 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.

At December 31, 2024 we have $70.6 million foreign currency forward contracts outstanding. There were no foreign currency forward contracts outstanding at December 31, 2023.

We had interest rate swap contracts that fixed a portion of the interest payments on our Term Loan Facility. The interest rate swap contracts expired on September 10, 2024. In connection with the expiration, there are no longer any related balances for these contracts within accumulated other comprehensive income (loss) on the Consolidated Balance Sheets as of December 31, 2024. See *Note 18. Long-Term Debt* in Part II, Item 8 “Financial Statements and Supplementary Data.”

See *Note 6. Fair Value Measurements* for information regarding the 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 credit risk by reviewing counterparty creditworthiness on a regular basis and limiting exposure to any single counterparty.

NOTE 8. ACCOUNTS RECEIVABLE, NET

We record accounts receivable at net realizable value. Our accounts receivable, net balance on the Consolidated Balance Sheets was $265.3 million at December 31, 2024. The following table summarizes the changes in expected credit losses related to receivables:

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Balance at beginning of period	$ 1,762	$ 1,814	$ 5,784
Additions	94	220	441
Deductions - write-offs, net of recoveries	(932)	(281)	(4,381)
Foreign currency translation	—	9	(30)
Balance at end of period	$ 924	$ 1,762	$ 1,814

NOTE 9. INVENTORIES

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

	December 31,	
	2024	2023
	(in thousands)	
Parts and raw materials	$ 255,100	$ 249,698
Work in process	20,581	14,595
Finished goods	84,730	71,844
Total	$ 360,411	$ 336,137

NOTE 10. PROPERTY AND EQUIPMENT, NET

Property and equipment, net is comprised of the following:

	Estimated Useful Life (in years)	December 31, 2024	December 31, 2023
		(in thousands)	
Buildings, machinery, and equipment	5 to 25	$ 196,564	$ 191,744
Software	3 to 10	35,616	24,526
Computer equipment, furniture, fixtures, and vehicles	3 to 5	25,977	19,281
Leasehold improvements	2 to 10	93,023	79,764
Capital projects in process		35,392	21,721
		386,572	337,036
Less: Accumulated depreciation		(200,968)	(169,371)
Property and equipment, net		$ 185,604	$ 167,665

The following table summarizes property and equipment, net by geographic area:

	December 31,	
	2024	2023
	(in thousands)	
United States	$ 83,773	$ 63,222
Asia	87,771	96,045
Europe and other	14,060	8,398
Total	$ 185,604	$ 167,665

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

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Depreciation expense	$ 42,409	$ 38,279	$ 34,182

NOTE 11. INTANGIBLE ASSETS AND GOODWILL

Intangible assets consisted of the following:

	December 31, 2024			
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Weighted Average Remaining Useful Life (in years)
		(in thousands)		
Technology	$ 99,875	$ (69,979)	$ 29,896	7.0
Customer relationships	168,908	(70,913)	97,995	8.5
Trademarks and other	27,062	(15,562)	11,500	4.6
Total	$ 295,845	$ (156,454)	$ 139,391	7.9

	December 31, 2023			
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Weighted Average Remaining Useful Life (in years)
		(in thousands)		
Technology	$ 97,961	$ (60,412)	$ 37,549	6.8
Customer relationships	168,685	(58,835)	109,850	9.5
Trademarks and other	27,141	(13,062)	14,079	5.6
Total	$ 293,787	$ (132,309)	$ 161,478	8.5

Amortization expense related to intangible assets was as follows:

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Amortization expense	$ 26,046	$ 28,254	$ 26,114

Estimated future amortization expense related to intangibles is as follows:

Year Ending December 31,	(in thousands)
2025	$ 22,051
2026	19,967
2027	17,745
2028	16,524
2029	14,939
Thereafter	48,165
Total	$ 139,391

The following table summarizes the changes in goodwill:

	December 31, 2024	December 31, 2023
	(in thousands)	
Balance at beginning of period	$ 283,840	$ 281,433
Additions from acquisition	16,120	—
Measurement period adjustments	—	353
Foreign currency translation and other	(3,958)	2,054
Balance at end of period	$ 296,002	$ 283,840

NOTE 12. RESTRUCTURING, ASSET IMPAIRMENTS, AND OTHER CHARGES

Details of restructuring, asset impairments, and other charges are as follows:

	Years Ended December 31,		
	2024	2023	2022
	(in thousands)		
Restructuring	$ 28,074	$ 25,134	$ 6,814
Asset impairments	—	1,446	—
Other charges	2,244	397	—
Total restructuring, asset impairments, and other charges	$ 30,318	$ 26,977	$ 6,814

Restructuring

We have several restructuring plans in process:

2024 Plan

On July 29, 2024, we approved actions in furtherance of our manufacturing consolidation initiatives intended to optimize our manufacturing footprint and cost structure, including the closure of our Zhongshan, China manufacturing facility (the "2024 Plan"). In connection with the 2024 Plan, we recorded a $29.6 million charge primarily associated with expected employment-related charges for, among other things, one-time cash payments for severance, benefits expenses, payroll taxes, and other ancillary costs. The charge includes estimated liabilities for lease termination and facility exit costs, which could be subject to further adjustments. The remaining contractual rental obligations under the lease agreements are recorded in current portion of operating lease liabilities and operating lease liabilities on our Consolidated Balance Sheets.

The amounts incurred as a result of the approved actions are estimates and actual results may differ, which could result in incremental restructuring charges in future periods. We anticipate the 2024 Plan will be substantially completed by the end of second quarter of 2025, with final activities expected to conclude in 2026.

2023 Plan

In 2023, we approved a plan intended to optimize and further consolidate our manufacturing operations and functional support groups as well as a general reduction-in-force to align our expenses to revenue levels (the "2023 Plan"). We expect to incur approximately $1.0 million in additional charges through the second quarter of 2025. The 2023 Plan is substantially complete, with the final activities expected to conclude in 2026.

2022 Plan

This plan was approved to improve our operating efficiencies and drive the realization of synergies from our business combinations by consolidating our operations, optimizing our factory footprint, including moving certain production into our higher volume factories, reducing redundancies, and lowering our cost structure. The 2022 Plan is now complete.

Changes in restructuring liabilities were as follows:

	2024 Plan	2023 Plan	2022 Plan	2018 Plan	Total
			(in thousands)		
December 31, 2022	$ —	$ —	$ 5,788	$ 1,422	$ 7,210
Costs incurred and charged to expense	—	17,103	8,199	(168)	25,134
Costs paid or otherwise settled	—	(2,879)	(11,057)	(1,066)	(15,002)
December 31, 2023	—	14,224	2,930	188	17,342
Costs incurred and charged to expense	29,649	(1,663)	88	—	28,074
Costs paid	(5,057)	(7,593)	(3,018)	(188)	(15,856)
Foreign currency translation	457	—	—	—	457
December 31, 2024	$ 25,049	$ 4,968	$ —	$ —	$ 30,017

The above restructuring liability of $30.0 million is comprised of $23.9 million in other accrued expenses and $6.1 million included in other long-term liabilities on our Consolidated Balance Sheets.

Charges related to our restructuring plans are as follows:

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Severance and related charges	$ 27,977	$ 25,134	$ 6,469
Facility relocation and closure charges	97	—	345
Total restructuring charges	$ 28,074	$ 25,134	$ 6,814

	Cumulative Cost Through December 31, 2024			
	2024 Plan	2023 Plan	2022 Plan	Total
		(in thousands)		
Severance and related charges	$ 29,552	$ 15,440	$ 14,075	$ 59,067
Facility relocation and closure charges	97	—	—	97
Total restructuring charges	$ 29,649	$ 15,440	$ 14,075	$ 59,164

Other Charges

Other charges relate to vacating and relocating facilities.

NOTE 13. WARRANTIES

Our sales agreements include customary product warranty provisions, which generally range from 12 to 36 months after shipment. We record the estimated warranty obligations cost when we recognize revenue. This estimate is based on historical experience by product.

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,	
	2024	2023
	(in thousands)	
Balance at beginning of period	$ 4,007	$ 5,702
Net increases to accruals	3,532	2,317
Warranty expenditures	(2,014)	(4,017)
Effect of changes in exchange rates	128	5
Balance at end of period	$ 5,653	$ 4,007

NOTE 14. LEASES

Components of total operating lease cost were as follows:

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Operating lease cost	$ 23,772	$ 22,571	$ 22,626
Short-term and variable lease cost	3,134	4,150	4,838
Total operating lease cost	$ 26,906	$ 26,721	$ 27,464

Estimated future payments on our operating lease liabilities are as follows:

Year Ending December 31,	(in thousands)
2025	$ 23,840
2026	18,723
2027	15,392
2028	15,033
2029	11,728
Thereafter	55,394
Total lease payments	140,110
Less: Interest	(33,106)
Present value of lease liabilities	$ 107,004

In addition to the above, we have a lease agreement with total payments of $7.0 million that commences in the first quarter of 2025 and extends through 2040.

In connection with the closure of our Zhongshan, China manufacturing facility under the 2024 Plan (see *Note 12. Restructuring, Asset Impairments, and Other Charges*), we expect to terminate the facility's lease agreement before its expiration. During 2024, we reduced both the operating lease right-of-use asset and operating lease liability by $20.7 million.

The following tables present additional information about our lease agreements:

	December 31, 2024	December 31, 2023
Weighted average remaining lease term (in years)	8.4	8.3
Weighted average discount rate	6.1 %	5.0 %

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Cash paid for operating leases	$ 23,671	$ 22,988	$ 22,287
Right-of-use assets obtained in exchange for operating lease liabilities	$ 41,070	$ 14,321	$ 17,022

NOTE 15. 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 permitted by law. Participants are immediately vested in both their own contributions and profit-sharing contributions. Profit-sharing contributions, which are discretionary, are approved by the Board. For all periods presented, we based our profit-sharing contribution on matching 100% of employee contributions up to 3% of compensation plus an additional match of 50% on the next 2% of compensation.

During the years ended December 31, 2024, 2023, and 2022 we recognized total defined contribution plan costs of $5.0 million, $5.1 million, and $4.5 million, respectively.

Defined Benefit Plans

We maintain defined benefit pension plans for certain of our non-U.S. employees in the United Kingdom, 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 current 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:

	December 31, 2024	December 31, 2023
	(in thousands)	
Projected benefit obligation, beginning of year	$ 65,653	$ 56,520
Service cost	1,022	1,016
Interest cost	2,799	2,909
Actuarial loss (gain)	(409)	4,808
Benefits paid	(1,934)	(1,452)
Translation adjustment	(2,790)	1,852
Projected benefit obligation, end of year	64,341	65,653
Fair value of plan assets, beginning of year	$ 14,115	$ 12,489
Expected return	714	654
Contributions	1,556	1,443
Benefits paid	(1,363)	(1,140)
Actuarial gain (loss)	(564)	17
Translation adjustment	(404)	652
Fair value of plan assets, end of year	14,054	14,115
Funded status of plan	$ (50,287)	$ (51,538)

	December 31, 2024	December 31, 2023
	(in thousands)	
Accumulated benefit obligation	$ 55,918	$ 58,968

The following table summarizes classification of our net pension benefit obligation on our Consolidated Balance Sheets. The current portion of the liability is included in accrued payroll and employee benefits.

	December 31,	
	2024	2023
	(in thousands)	
Current	$ 732	$ 2,403
Long-term	49,555	49,135
Total pension benefit obligation	$ 50,287	$ 51,538

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,		
	2024	2023	2022
		(in thousands)	
Service cost	$ 1,022	$ 1,016	$ 1,133
Interest cost	2,799	2,909	1,819
Expected return on plan assets	(714)	(654)	(535)
Amortization of actuarial gains and losses	(210)	(404)	322
Net periodic pension cost	$ 2,897	$ 2,867	$ 2,739

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

	Years Ended December 31,		
	2024	2023	2022
Discount rate used for net periodic pension costs	4.4 %	5.1 %	2.6 %
Discount rate used for pension benefit obligations	5.0 %	4.4 %	5.1 %
Expected long-term return on plan assets	5.9 %	5.2 %	3.2 %

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

	December 31, 2024			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Diversified Growth Fund	$ —	$ 11,510	$ —	$ 11,510
Corporate Bonds	—	1,334	—	1,334
Insurance Contracts	—	—	697	697
Cash	513	—	—	513
Total	$ 513	$ 12,844	$ 697	$ 14,054

	December 31, 2023			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Diversified Growth Fund	$ —	$ 11,606	$ —	$ 11,606
Corporate Bonds	—	1,212	—	1,212
Insurance Contracts	—	—	799	799
Cash	498	—	—	498
Total	$ 498	$ 12,818	$ 799	$ 14,115

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

Year Ending December 31,	(in thousands)
2025	$ 2,420
2026	3,943
2027	3,389
2028	3,578
2029	5,125
2029 to 2034	23,509

As of December 31, 2024 and 2023, accumulated other comprehensive income (loss) on the Consolidated Balance Sheets includes net actuarial gains and other deferred items, net of related taxes of $10.6 million and $11.4 million, respectively, that have not yet been recognized in net periodic pension cost.

NOTE 16. STOCK-BASED COMPENSATION

The Compensation Committee of our Board of Directors administers our stock plans. As of December 31, 2024, we have two active stock-based incentive compensation plans: the Amended and Restated 2023 Omnibus Incentive Plan (the "2023 Incentive Plan") and the Employee Stock Purchase Plan ("ESPP"). We issue all new equity compensation grants under the 2023 Incentive Plan. Outstanding awards previously issued under inactive plans will continue to vest and remain exercisable in accordance with the terms of the respective plans.

The 2023 Incentive Plan provides for the grant of awards including stock options, stock appreciation rights, performance stock units, performance units, stock, restricted stock, restricted stock units, and cash incentive awards.

The following table summarizes information related to our stock-based incentive compensation plans:

	December 31, 2024
	(in thousands)
Shares available for future issuance under the 2023 Incentive Plan	1,828
Shares available for future issuance under the ESPP	535

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. For the year ended December 31, 2024, stock-based compensation expense includes $1.8 million related to a modification for accounting purposes of prior awards and $1.9 million related to the Airity acquisition (see *Note 2. Acquisition*). Stock-based compensation expense was as follows:

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Stock-based compensation expense	$ 45,940	$ 31,001	$ 19,849

Restricted Stock Units

Generally, we grant restricted stock units ("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. RSUs are generally granted with a grant date fair value based on the market price of our stock on the date of grant.

Changes in our RSUs were as follows:

	Year Ended December 31, 2024	
	Number of RSUs	Weighted-Average Grant Date Fair Value
	(in thousands)	
RSUs outstanding at beginning of period	917	$ 85.96
RSUs granted	548	$ 104.84
RSUs vested	(314)	$ 90.04
RSUs forfeited	(107)	$ 81.97
RSUs outstanding at end of period	1,044	$ 95.05

For vested RSUs, employees withheld shares for income tax totaling $9.1 million.

The weighted-average grant date fair value for RSUs granted in the years ended December 31, 2024, 2023, and 2022 was $104.84, $100.04, and $74.62, respectively. The fair value of RSUs vested for the years ended December 31, 2024, 2023 and 2022 was $28.2 million, $19.5 million, and $13.5 million, respectively. As of December 31, 2024, there was $53.4 million of total unrecognized compensation cost, net of expected forfeitures, related to non-vested RSUs, that we expect to recognize through December 2027, with a weighted-average remaining vesting period of 1.0 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. Stock option awards generally have a term of ten years.

Changes in our stock options were as follows:

	Year Ended December 31, 2024		
	Number of Options	Weighted-Average Exercise Price per Share	Weighted-Average Remaining Contractual Life
	(in thousands)		
Options outstanding at beginning of period	89	$ 76.69	7.10 years
Options exercised	(10)	$ 26.32	
Options outstanding at end of period	79	$ 83.05	6.86 years
Options vested at end of period	54	$ 81.70	6.70 years

The total intrinsic value of options exercised for the years ended December 31, 2024, 2023 and 2022 was $0.8 million, $4.6 million, and $2.6 million, respectively. As of December 31, 2024, the aggregate intrinsic value of options outstanding and exercisable was $2.6 million and $1.8 million, respectively. As of December 31, 2024, there was $0.2 million of total unrecognized compensation cost, net of expected forfeitures, related to the unvested options that we expect to recognize over a remaining period of 0.2 years.

Employee Stock Purchase Plan

The ESPP is a stockholder-approved plan that allows eligible employees to purchase our common stock at a discount. Employees who meet the eligibility criteria 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.

As of December 31, 2024, there was $0.5 million of total unrecognized compensation cost related to the ESPP that we expect to recognize over a remaining period of five months.

Deferred Compensation Plan

We offer certain employees the opportunity to elect to defer compensation for salary, bonus, commission, and stock awards. The Company maintains a rabbi trust in connection with the deferred compensation plan. Assets of the rabbi trust not held in Company shares are presented in other assets, and the fair value of the Company shares held in the rabbi trust is classified in stockholders' equity. After a holding period, employees have the option to diversify the Company shares into other funds. Stock awards that have been elected for deferral but have not yet vested and are probable of vesting are reported as deferred compensation in the temporary equity section of the Consolidated Balance Sheets. The stock awards recorded in temporary equity are recognized at fair value, with any difference from stock-based compensation recorded in retained earnings.

NOTE 17. 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 intellectual property 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 intellectual property 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 such loss can be reasonably estimated. We are not currently a party to any legal action that we believe would have a material adverse impact on our business, financial condition, results of operations or cash flows.

We maintain defined benefit pension plans for certain of our non-U.S. employees, including those in the United Kingdom. In light of the United Kingdom's High Court ruling in the case of Virgin Media Ltd v. NTL Pension Trustees II Ltd & Ors, we reviewed past amendments made to our United Kingdom pension plans. While unlikely, should there be a challenge to any previous amendments, we could face potential litigation and compliance risks. We continue to account for our United Kingdom pension plans in accordance with the plan agreements and amendments, as we believe they represent a mutual understanding and agreement among all parties.

NOTE 18. LONG-TERM DEBT

Long-term debt on our Consolidated Balance Sheets consists of the following:

	December 31, 2024	December 31, 2023
	(in thousands)	
Convertible Notes due 2028, 2.5% interest	$ 575,000	$ 575,000
Term Loan Facility	—	355,000
Gross long-term debt, including current maturities	575,000	930,000
Less: debt discount	(10,305)	(14,321)
Net long-term debt, including current maturities	564,695	915,679
Less: current maturities	—	(20,000)
Net long-term debt	$ 564,695	$ 895,679

For all periods presented, we were in compliance with the covenants under all debt agreements.

The following table summarizes interest expense related to our debt:

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Interest expense	$ 21,997	$ 15,186	$ 6,607
Amortization of debt issuance costs	3,219	1,330	547
Total interest expense related to debt	$ 25,216	$ 16,516	$ 7,154

Credit Agreement

Our credit agreement dated as of September 10, 2019, as amended (the "Credit Agreement") consists of a senior unsecured term loan facility ("Term Loan Facility") and a senior unsecured revolving facility ("Revolving Facility"), both maturing on September 9, 2026.

On September 9, 2024, we entered into an amendment to the Credit Agreement to increase the capacity on the Revolving Facility from $200.0 million to $600.0 million. This amendment was in connection with the concurrent prepayment, using existing cash on hand, of the full $345.0 million outstanding principal balance under our Term Loan Facility.

For all periods presented, no amounts were outstanding on the Revolving Facility. The following table summarizes our availability to withdraw on the Revolving Facility:

	December 31, 2024	December 31, 2023
	(in thousands)	
Available capacity on Revolving Facility	$ 600,000	$ 200,000

In addition to our available capacity on the Revolving Facility, prior to the maturity date of the Credit Agreement, we may request an increase to the financing commitments in either the Term Loan Facility or Revolving Facility by an aggregate amount not to exceed $250.0 million. Any requested increase is subject to lender approval.

The interest rate swap contracts previously entered into relative to the Term Loan Facility expired on September 10, 2024. Should we have future borrowings under the Term Loan Facility or Revolving Facility, they will bear interest, at our option, at a rate based on the Base Rate or SOFR, as defined in the Credit Agreement, plus an applicable margin.

Convertible Senior Notes due 2028

On September 12, 2023, we completed a private, unregistered offering of $575.0 million aggregate principal amount of 2.50% convertible senior notes due 2028 ("Convertible Notes"). The $564.7 million remaining outstanding principal amount of the Convertible Notes, net of unamortized issuance costs, continues to be classified as long-term debt as none of the conversion triggers occurred as of December 31, 2024.

The Convertible Notes mature on September 15, 2028, unless earlier repurchased, redeemed, or converted. Interest is payable semi-annually in arrears in March and September. We do not maintain a sinking fund.

We may redeem for cash all or any portion of the Convertible Notes, at our option, on or after September 20, 2026 if the last reported sale price of our common stock has been at least 130% of the conversion price then in effect for at least 20 trading days (whether or not consecutive) during any 30 consecutive trading-day period (including the last trading day of such period). The redemption price is 100% of the principal amount plus accrued and unpaid interest.

Prior to May 15, 2028, holders have the option to convert all or a portion of their Convertible Notes under the following circumstances:

- during any calendar quarter if the last reported sale price of our common stock, for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days is greater than or equal to 130% of the conversion price on each applicable trading day;
- during the five business day period immediately after any five consecutive trading day period in which the trading price per $1,000 principal amount of the Convertible Notes for each trading day was less than 98% of the product of the last reported sale price of our common stock on each such trading day and the conversion rate on each such trading day;
- if Advanced Energy calls any or all of the Convertible Notes for redemption; or
- upon the occurrence of specified corporate transactions or events described in the indenture.

From May 15, 2028 through the maturity date, holders have the option to convert at any time regardless of circumstances.

The initial conversion rate is 7.2747 shares of common stock per $1,000 principal amount, which is equivalent to an initial conversion price of approximately $137.46 per share of common stock. The conversion rate is subject to adjustment upon the occurrence of certain specified events as set forth in the indenture.

Upon conversion, Advanced Energy will do the following:

- pay cash up to the aggregate principal amount to be converted; and
- pay or deliver cash, shares of our common stock, or a combination (at our election) with respect to the remainder, if any, of the conversion obligation in excess of the aggregate principal amount being converted.

Concurrent with the Convertible Notes issuance, we entered into hedges (“Note Hedges”) with respect to our common stock and sold warrants to purchase our common stock (“Warrants”). In combination, the Note Hedges and Warrants synthetically increase the initial conversion price on the Convertible Notes from $137.46 to $179.76, reducing the potential dilutive effect.

The Warrants provide the counterparties the option to acquire approximately 4.2 million aggregate shares of our common stock (subject to customary anti-dilution adjustments), which is the same number of shares of our common stock covered by the Note Hedges at a $179.76 per share initial exercise price, which represents a 70% premium over the $105.74 closing price of our common stock on September 7, 2023. The Warrants expire on July 7, 2029.

If the market value per share of our common stock exceeds the exercise price of the Warrants during the measurement period at the maturity of such Warrants, the Warrants will have a dilutive effect on our earnings per share as we will owe the counterparties a number of shares of common stock in an amount based on the excess of such market price per share of the common stock over the Warrants’ exercise price.

The Note Hedge and Warrants are separate from the Convertible Notes. The Convertible Notes holders have no rights with respect to the Note Hedges and Warrants. Counterparties in the Note Hedge and Warrants transactions have no rights with respect to the Convertible Notes.

We use level 2 measurements to estimate the fair value of our debt. As of December 31, 2024, we estimate the fair value of our Convertible Notes to be $624.6 million.

NOTE 19. SUPPLEMENTAL CASH FLOW INFORMATION

	Years Ended December 31,		
	2024	2023	2022
		(in thousands)	
Non-cash investing activities:			
Capital expenditures in accounts payable and other accrued expenses	$ 9,723	$ 8,962	$ 11,669
Common stock used as consideration in business combination	$ 4,463	$ —	$ —
Cash paid for:			
Interest	$ 17,266	$ 14,429	$ 6,608
Income taxes	$ 33,313	$ 47,937	$ 17,546
Cash received from income taxes	$ 3,752	$ 2,368	$ 7,122

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 Exchange Act is recorded, processed, summarized, and reported, within the time periods specified in the SEC'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 Exchange 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 R. Oldham, Executive Vice President and 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, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2024. The conclusions of the Chief Executive Officer and Chief Financial Officer from this evaluation were communicated to the Audit and Finance Committee. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. 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.

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, 2024, 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, 2024.

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, 2024.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting that occurred during the fourth quarter of the current year that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Limitations on Controls and Procedures

Management 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.

ITEM 9B. OTHER INFORMATION

During the fourth quarter of 2024, two of our officers adopted a "Rule 10b5-1 trading arrangement" (as defined in Item 408 of Regulation S-K) intended to satisfy the affirmative defense conditions of Rule 10b5-1(c), as amended. The table below summarizes the terms of Rule 10b5-1 trading arrangements adopted:

Name and Title	Date of Adoption	Duration of the Trading Arrangement [1]	Aggregate Number of Shares to be Sold
Paul Oldham Executive Vice President and Chief Financial Officer	Nov. 27, 2024	Until Nov. 27, 2025, or such earlier date upon which all transactions are completed	12,084 [2]
Eduardo Bernal Executive Vice President and Chief Operations Officer	Dec. 2, 2024	Until Nov. 5, 2025, or such earlier date upon which all transactions are completed	28,606 [2]

(1) The Rule 10b5-1 trading arrangements also provide for termination prior to the above-listed expiration date following the occurrence of certain events, such as public announcement of a tender offer, exchange offer or certain M&A, reorganization, or recapitalization transactions or the bankruptcy, insolvency, or death of the adopting person.

(2) Includes 12,084 shares of common stock issuable upon the exercise of options.

During the fourth quarter of 2024, no other director or officer adopted or terminated a "Rule 10b5-1 trading arrangement" or a "non-Rule 10b5-1 trading arrangement" (as defined in Item 408 of Regulation S-K).

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 2025 annual meeting of stockholders (the "2025 Proxy Statement"), as set forth below. The 2025 Proxy Statement will be filed with the SEC within 120 days after the end of our fiscal year.

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

The information set forth in the 2025 Proxy Statement under the headings "Proposal No. 1 - Election of Directors," "Corporate Governance," and "Management," 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 our 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.

We have also adopted an Insider Trading Policy governing the purchase, sale, and/or other dispositions of the Company's securities that applies to all directors, officers, and employees, as well as the Company itself. We believe our Insider Trading Policy is reasonably designed to promote compliance with insider trading laws, rules and regulations, and applicable listing standards. A copy of the Insider Trading Policy is filed with this annual report on Form 10-K as Exhibit 19.1.

ITEM 11. EXECUTIVE COMPENSATION

The information set forth in the 2025 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 2025 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, 2024. All outstanding awards relate to our common stock.

	(A)	(B)	(C)
Plan Category	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	79 [1]	$ 83.05	2,363 [2]
Equity compensation plans not approved by security holders	—	—	—
Total	79 [1]	$ 83	2,363

(1) Includes shares underlying options granted under the prior plan.
(2) This number includes 535 thousand shares available for future issuance under the Employee Stock Purchase Plan.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information set forth in the 2025 Proxy Statement under the heading "Certain Relationships and Related Transactions" and under the sub-heading "Independence", which appears under the heading "Proposal No. 1 - Election of Directors" is incorporated herein by reference.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information set forth in the 2025 Proxy Statement under the heading "Proposal No. 2 - Ratification of the Appointment of Ernst & Young LLP as Advanced Energy's Independent Registered Public Accounting Firm for 2025" is incorporated herein by reference.

PART IV

ITEM 15. EXHIBIT 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, 2024, 2023, and 2022

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
2.3	Stock Purchase Agreement, dated April 1, 2022, by and among SL Power Electronics Corporation, SL Delaware Holdings, Inc., Steel Partners Holdings L.P., AEI US Subsidiary, LLC and Advanced Energy Industries, Inc. **	8-K	000-26966	2.1	April 4, 2022
3.1	Amended and Restated Certificate of Incorporation of Advanced Energy Industries, Inc.	8-K	000-26966	3.1	May 1, 2024

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
3.2	Third Amended and Restated By-Laws of Advanced Energy Industries, Inc.	8-K	000-26966	3.2	May 1, 2024
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				Filed herewith
4.3	Indenture, dated September 12, 2023, between Advanced Energy Industries, Inc. and U.S. Bank Trust Company, National Association, as trustee	8-K	000-26966	4.1	September 13, 2023
4.4	Form of Global 2.50% Convertible Senior Note due 2028 (included in Exhibit 4.3)	8-K	000-26966	4.2	September 13, 2023
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 Director and Officer Indemnification Agreement	10-K	000-26966	10.2	February 17, 2023
10.3	2017 Omnibus Incentive Plan *	DEF 14A	000-26966	Appendix A	March 14, 2017
10.4	Employee Stock Purchase Plan *	DEF 14A	000-26966	Appendix B	March 10, 2021
10.5	Offer Letter dated February 8, 2021 *	8-K	000-26966	10.2	February 10, 2021
10.6	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
10.7	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
10.8	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
10.9	Offer Letter to Paul Oldham, dated March 26, 2018 *	8-K	000-26966	10.1	March 29, 2018

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
10.10	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
10.11	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
10.12	Offer of Employment to Eduardo Bernal Acebedo, dated August 2, 2021 *	8-K	000-26966	10.1	September 8, 2021
10.13	Form of Long-Term Incentive Plan *	8-K	000-26966	10.1	February 4, 2021
10.14	Amended and Restated Deferred Compensation Plan *	10-Q	000-26966	10.1	November 1, 2022
10.15	Form of Restricted Stock Unit Agreement under 2017 Omnibus Incentive Plan *	10-K	000-26966	10.25	February 17, 2023
10.16	Form of LTI Performance Stock Unit Agreement under 2017 Omnibus Incentive Plan *	10-K	000-26966	10.26	February 17, 2023
10.17	Amendment No. 2 to Credit Agreement, dated March 31, 2023, among Advanced Energy Industries, Inc., the guarantors party thereto, Bank of America N.A., as Administrative Agent, and the Lenders party thereto	10-Q	000-26966	10.1	May 3, 2023
10.18	Form of Confirmation for Convertible Note Hedges***	8-K	000-26966	10.1	September 13, 2023
10.19	Form of Confirmation for Warrants***	8-K	000-26966	10.2	September 13, 2023
10.20	Amendment No. 3 to Credit Agreement, dated September 7, 2023, among Advanced Energy Industries, Inc., the guarantors party thereto, Bank of America, N.A., as Administrative Agent, and the Lenders party thereto	8-K	000-26966	10.3	September 13, 2023
10.21	Amended and Restated 2023 Omnibus Incentive Plan *	8-K	000-26966	10.1	November 8, 2023
10.22	Form of Executive Change in Control and General Severance Agreement *	8-K	000-26966	10.2	November 8, 2023
10.23	Form of Performance Stock Unit Agreement under the Amended and Restated 2023 Omnibus Incentive Plan *	10-K	000-26966	10.32	February 20, 2024

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
10.24	Form of Restricted Stock Unit Agreement under the Amended and Restated 2023 Omnibus Incentive Plan *				Filed herewith
10.25	Form of Annual Incentive Plan *	10-K	000-26966	10.34	February 20, 2024
10.26	Amendment No. 4 to Credit Agreement, dated September 9, 2024, among Advanced Energy Industries, Inc., the guarantors party thereto, Bank of America, N.A., as Administrative Agent, and the Lenders party thereto	8-K	000-26966	10.1	September 11, 2024
19.1	Insider Trading Policy				Filed herewith
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
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
97.1	Compensation Clawback Policy	10-K	000-26966	97.1	February 20, 2024
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

Exhibit Number	Description	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
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

* Management contract or compensatory plan.

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

*** Certain personally identifiable information has been omitted from this exhibit pursuant to Item 601(a)(6) of Regulation S-K.

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

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

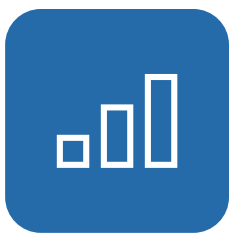
Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this annual report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.

ADVANCED ENERGY INDUSTRIES, INC.
(Registrant)

/s/ Stephen D. Kelley
Stephen D. Kelley
Chief Executive Officer
Date: February 18, 2025

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.

Signatures	Title	Date
/s/ Stephen D. Kelley Stephen D. Kelley	Chief Executive Officer and Director (Principal Executive Officer)	February 18, 2025
/s/ Paul R Oldham Paul R Oldham	Chief Financial Officer and Executive Vice President (Principal Financial Officer)	February 18, 2025
/s/ Bernard R. Colpitts, Jr. Bernard R. Colpitts, Jr.	Chief Accounting Officer and Senior Vice President (Principal Accounting Officer)	February 18, 2025
/s/ Grant H. Beard Grant H. Beard	Chairman of the Board	February 18, 2025
/s/ Frederick A. Ball Frederick A. Ball	Director	February 18, 2025
/s/ Anne T. DelSanto Anne T. DelSanto	Director	February 18, 2025
/s/ Tina M. Donikowski Tina M. Donikowski	Director	February 18, 2025
/s/ Ronald C. Foster Ronald C. Foster	Director	February 18, 2025
/s/ Lanesha T. Minnix Lanesha T. Minnix	Director	February 18, 2025
/s/ David W. Reed David W. Reed	Director	February 18, 2025
/s/ John A. Roush John A. Roush	Director	February 18, 2025
/s/ Brian M. Shirley Brian M. Shirley	Director	February 18, 2025





Advanced Energy

Advanced Energy Industries, Inc.
1595 Wynkoop Street, Suite 800
Denver, CO 80202

advancedenergy.com