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

FORM 10-Q

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

For the quarterly period ended March 31, 2022

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**

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 is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☑

As of April 30, 2022, there were 37,559,319 shares of the registrant's common stock, par value $0.001 per share, outstanding.

ADVANCED ENERGY INDUSTRIES, INC.
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PART I FINANCIAL INFORMATION

ITEM 1. UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS

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

	March 31, 2022	December 31, 2021
ASSETS		
Current assets:		
Cash and cash equivalents	$ 521,236	$ 544,372
Marketable securities	2,282	2,296
Accounts and other receivable, net	248,732	237,227
Inventories	360,801	338,410
Other current assets	41,429	39,929
Total current assets	1,174,480	1,162,234
Property and equipment, net	117,287	114,830
Operating lease right-of-use assets	101,581	101,769
Deposits and other assets	27,175	19,669
Goodwill	211,493	212,190
Intangible assets, net	153,608	159,406
Deferred income tax assets	46,734	47,242
TOTAL ASSETS	$ 1,832,358	$ 1,817,340
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 183,085	$ 193,708
Income taxes payable	15,627	9,226
Accrued payroll and employee benefits	49,618	55,833
Other accrued expenses	49,704	53,445
Customer deposits and other	29,643	22,141
Current portion of long-term debt	20,000	20,000
Current portion of operating lease liabilities	15,718	15,843
Total current liabilities	363,395	370,196
Long-term debt, net	367,868	372,733
Operating lease liabilities	95,123	95,180
Pension benefits	65,956	67,255
Deferred income tax liabilities	9,346	9,921
Other long-term liabilities	29,351	30,559
Total liabilities	931,039	945,844
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; 37,559 and 37,589 issued and outstanding at March 31, 2022 and December 31, 2021, respectively	38	38
Additional paid-in capital	116,928	115,706
Accumulated other comprehensive income (loss)	750	(1,216)
Retained earnings	782,972	756,323
Advanced Energy stockholders' equity	900,688	870,851
Noncontrolling interest	631	645
Total stockholders' equity	901,319	871,496
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	$ 1,832,358	$ 1,817,340

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

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

	Three Months Ended March 31, 2022	2021
Sales, net	$ 397,459	$ 351,620
Cost of sales	253,143	214,117
Gross profit	144,316	137,503
Operating expenses:		
Research and development	43,614	40,168
Selling, general, and administrative	49,318	46,731
Amortization of intangible assets	5,509	5,384
Restructuring expense	1,218	1,038
Total operating expenses	99,659	93,321
Operating income	44,657	44,182
Other income (expense), net	(842)	(507)
Income from continuing operations, before income taxes	43,815	43,675
Provision for income taxes	6,953	5,284
Income from continuing operations	36,862	38,391
Income (loss) from discontinued operations, net of income taxes	(98)	310
Net income	$ 36,764	$ 38,701
Income (loss) from continuing operations attributable to noncontrolling interest	(14)	33
Net income attributable to Advanced Energy Industries, Inc.	$ 36,778	$ 38,668
Basic weighted-average common shares outstanding	37,549	38,328
Diluted weighted-average common shares outstanding	37,770	38,583
Earnings per share:		
Continuing operations:		
Basic earnings per share	$ 0.98	$ 1.00
Diluted earnings per share	$ 0.98	$ 0.99
Discontinued operations:		
Basic earnings (loss) per share	$ —	$ 0.01
Diluted earnings (loss) per share	$ —	$ 0.01
Net income:		
Basic earnings per share	$ 0.98	$ 1.01
Diluted earnings per share	$ 0.97	$ 1.00

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

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

	Three Months Ended March 31,	
	2022	**2021**
Net income	$ 36,764	$ 38,701
Other comprehensive income (loss), net of income taxes		
Foreign currency translation	(4,092)	(6,941)
Change in fair value of cash flow hedges	5,913	2,009
Minimum pension benefit retirement liability	145	(36)
Comprehensive income	$ 38,730	$ 33,733
Comprehensive income (loss) attributable to noncontrolling interest	(14)	33
Comprehensive income attributable to Advanced Energy Industries, Inc.	$ 38,744	$ 33,700

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

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

	Advanced Energy Industries, Inc. Stockholders' Equity						
	Common Stock						
	Shares	Amount	Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Non-controlling Interest	Total Stockholders' Equity
Balances, December 31, 2020	38,293	$ 38	$ 105,009	$ (2,605)	$ 712,297	$ 601	$ 815,340
Stock issued from equity plans	93	—	(4,645)	—	—	—	(4,645)
Stock-based compensation	—	—	5,701	—	—	—	5,701
Dividends declared ($0.10 per share)	—	—	—	—	(3,854)	—	(3,854)
Other comprehensive income (loss)	—	—	—	(4,968)	—	—	(4,968)
Net income	—	—	—	—	38,668	33	38,701
Balances, March 31, 2021	38,386	$ 38	$ 106,065	$ (7,573)	$ 747,111	$ 634	$ 846,275
Balances, December 31, 2021	37,589	$ 38	$ 115,706	$ (1,216)	$ 756,323	$ 645	$ 871,496
Stock issued from equity plans	52	—	(2,430)	—	—	—	(2,430)
Stock-based compensation	—	—	3,906	—	—	—	3,906
Share repurchase	(82)	—	(254)	—	(6,340)	—	(6,594)
Dividends declared ($0.10 per share)	—	—	—	—	(3,789)	—	(3,789)
Other comprehensive income	—	—	—	1,966	—	—	1,966
Net income (loss)	—	—	—	—	36,778	(14)	36,764
Balances, March 31, 2022	37,559	$ 38	$ 116,928	$ 750	$ 782,972	$ 631	$ 901,319

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

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

	Three Months Ended March 31, 2022	2021
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net income	$ 36,764	$ 38,701
Less: income (loss) from discontinued operations, net of income taxes	(98)	310
Income from continuing operations, net of income taxes	36,862	38,391
Adjustments to reconcile net income to net cash from operating activities:		
Depreciation and amortization	13,888	12,721
Stock-based compensation expense	3,928	5,701
Provision for deferred income taxes	(1,060)	(5)
Loss on disposal of assets	276	275
Changes in operating assets and liabilities, net of assets acquired		
Accounts and other receivable, net	(12,579)	(4,984)
Inventories	(23,616)	(27,503)
Other assets	(3,840)	(1,406)
Accounts payable	(6,469)	40,483
Other liabilities and accrued expenses	(5,183)	(12,534)
Income taxes	7,706	3,125
Net cash from operating activities from continuing operations	9,913	54,264
Net cash from operating activities from discontinued operations	(92)	(185)
Net cash from operating activities	9,821	54,079
CASH FLOWS FROM INVESTING ACTIVITIES:		
Proceeds from sale of assets	—	6
Purchases of property and equipment	(13,075)	(8,817)
Acquisitions, net of cash acquired	(600)	(3,604)
Net cash from investing activities	(13,675)	(12,415)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Payments on long-term borrowings	(5,000)	(4,375)
Dividend payments	(3,789)	(3,854)
Purchase and retirement of common stock	(6,594)	—
Net payments related to stock-based awards	(2,430)	(4,214)
Net cash from financing activities	(17,813)	(12,443)
EFFECT OF CURRENCY TRANSLATION ON CASH AND CASH EQUIVALENTS	(1,469)	321
NET CHANGE IN CASH AND CASH EQUIVALENTS	(23,136)	29,542
CASH AND CASH EQUIVALENTS, beginning of period	544,372	480,368
CASH AND CASH EQUIVALENTS, end of period	$ 521,236	$ 509,910
SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION:		
Cash paid for interest	$ 1,123	$ 979
Cash paid for income taxes	$ 2,444	$ 1,873
Cash received for refunds of income taxes	$ 2,366	$ 109

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

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS
(In thousands, except per share data)

NOTE 1. DESCRIPTION OF BUSINESS AND BASIS OF PRESENTATION

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

In management's opinion, the accompanying unaudited consolidated financial statements contain all adjustments, consisting of normal, recurring adjustments, necessary to present fairly the financial position of the Company as of March 31, 2022, and the results of our operations and cash flows for the three months ended March 31, 2022 and 2021.

The unaudited consolidated financial statements included herein have been prepared pursuant to the rules and regulations of the Securities and Exchange Commission ("SEC"). Certain information and footnote disclosures normally included in financial statements prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP") have been omitted pursuant to such rules and regulations. These unaudited consolidated financial statements should be read in conjunction with the audited consolidated financial statements and notes thereto contained in our Annual Report on Form 10-K for the year ended December 31, 2021 and other financial information filed with the SEC.

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;
- pension obligations;
- acquisitions and asset valuations; and
- taxes and other provisions.

Significant Accounting Policies

Our accounting policies are described in Note 1 to our audited consolidated financial statements in our Annual Report on Form 10-K for the year ended December 31, 2021.

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 October 2021, the FASB issued ASU 2021-08, "*Business Combinations (Topic 806) Accounting for Contract Assets and Contract Liabilities from Contracts with Customers."* The amendments in ASU 2021-08 address diversity and inconsistency related to the recognition and measurement of contract assets and contract liabilities acquired in a business combination. ASU 2021-08 requires an acquirer to recognize and measure contract assets and contract liabilities acquired in a business combination in accordance with ASC 606, *Revenue from Contracts with Customers*.

We adopted ASU 2021-08 on a prospective basis effective January 1, 2022. The adoption will impact future business combinations and require recognition and measurement of acquired contract assets and liabilities in accordance with ASC 606. Specifically, we will account for the related revenue contracts of the acquiree as if we originated the contracts. Adoption of ASU 2021-08 did not impact acquired contract assets or liabilities from prior business combinations.

New Accounting Standards Issued But Not Yet Adopted

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

Our Credit Facility (refer to *Note 18. Credit Facility*) and interest rate swap agreements (refer to *Note 7. Derivative Financial Instruments*) reference the one-month USD LIBOR rate. Both agreements contain provisions for transition to a new reference rate upon discontinuance of LIBOR. We expect the one-month USD LIBOR rate to be available through June 2023. We are currently assessing the potential timing of transitioning to a replacement interest rate benchmark for our Credit Facility and do not expect ASU 2020-04 and ASU 2020-01 to materially impact our consolidated financial statements.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
(In thousands, except per share data)

NOTE 2. ACQUISITIONS

TEGAM, Inc.

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

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

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

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

	Preliminary Fair Value
Current assets and liabilities, net	$ 3,475
Property and equipment	734
Operating lease right-of-use assets	425
Intangible assets	6,900
Goodwill (deductible for tax purposes)	5,938
Other non-current assets	31
Total assets acquired	17,503
Other non-current liabilities	25
Operating lease liability	425
Total liabilities assumed	450
Total fair value of net assets acquired	$ 17,053

NOTE 3. REVENUE

Nature of goods and services

Products

Advanced Energy provides highly engineered, mission-critical, precision power conversion, measurement, and control solutions to our global customers. We design, manufacture, sell, and support precision power products that transform, refine, and modify the raw electrical power coming from either the utility or the building facility and convert it into various types of highly controllable, usable power that is predictable, repeatable, and customizable to meet the necessary requirements for powering a wide range of complex equipment.

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

(In thousands, except per share data)

Services

Our services group offers warranty and after-market repair services in the regions in which we operate, providing us with preventive maintenance opportunities. Our customers continue to pursue low cost of ownership of their capital equipment and are increasingly sensitive to the costs of system downtime. They expect that suppliers offer comprehensive local repair service and customer support. To meet these market requirements, we maintain a worldwide support organization in the U.S., the People’s Republic of China ("PRC"), Japan, Korea, Taiwan, Germany, Ireland, Singapore, Israel, and Great Britain. Support services include warranty and non-warranty repair services, upgrades, and refurbishments on the products we sell.

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

The following table summarizes deferred revenue, which relates to extended warranties and service contracts. We expect to recognize this revenue ratably through the year 2031. Deferred revenue is included in customer deposits and other long-term liabilities on our Consolidated Balance Sheets.

	March 31, 2022	December 31, 2021
Deferred revenue	$ 6,165	$ 7,067

Disaggregation of Revenue

The following tables present additional information regarding our revenue:

	Three Months Ended March 31,	
	2022	2021
Semiconductor Equipment	$ 202,957	$ 180,716
Industrial and Medical	82,898	78,415
Data Center Computing	76,238	59,154
Telecom and Networking	35,366	33,335
Total	$ 397,459	$ 351,620

	Three Months Ended March 31,	
	2022	2021
Product	$ 362,876	$ 318,879
Services	34,583	32,741
Total	$ 397,459	$ 351,620

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
(In thousands, except per share data)

	Three Months Ended March 31,	
	2022	2021
United States	$ 158,742	$ 131,598
North America (excluding U.S.)	23,979	26,247
Asia	162,047	149,591
Europe	46,665	40,422
Other	6,026	3,762
Total	$ 397,459	$ 351,620

During the three months ended March 31, 2022, Applied Materials, Inc. and Lam Research Corporation accounted for 22% and 13%, respectively, of our total revenue compared to 19% and 10%, respectively, of our total revenue during the same period in the prior year.

NOTE 4. INCOME TAXES

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

	Three Months Ended March 31,	
	2022	2021
Income from continuing operations, before income taxes	$ 43,815	$ 43,675
Provision for income taxes	$ 6,953	$ 5,284
Effective tax rate	15.9 %	12.1 %

Our effective tax rates differ from the U.S. federal statutory rate of 21% for the three months ended March 31, 2022 and 2021, respectively, primarily due to 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. The effective tax rate for the first three months of 2022 was higher than the same period in 2021 primarily due to the January 1, 2022 effective date of a certain provision enacted as part of the 2017 Tax Cuts and Jobs Act.

NOTE 5. EARNINGS PER SHARE

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

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

	Three Months Ended March 31,	
	2022	2021
Income from continuing operations	$ 36,862	$ 38,391
Less: income (loss) from continuing operations attributable to noncontrolling interest	(14)	33
Income from continuing operations attributable to Advanced Energy Industries, Inc.	$ 36,876	$ 38,358
Basic weighted-average common shares outstanding	37,549	38,328
Assumed exercise of dilutive stock options and restricted stock units	221	255
Diluted weighted-average common shares outstanding	37,770	38,583
Continuing operations:		
Basic earnings per share	$ 0.98	$ 1.00
Diluted earnings per share	$ 0.98	$ 0.99

Share Repurchase

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

	Three Months Ended March 31,	
(in thousands, except per share amounts)	2022	2021
Amount paid to repurchase shares	$ 6,594	$ —
Number of shares repurchased	82	—
Average repurchase price per share	$ 80.02	$ —
Remaining authorized by Board of Directors for future repurchases as of period end	$ 121,783	$ 38,369

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

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
(In thousands, except per share data)

NOTE 6. FAIR VALUE MEASUREMENTS

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

		March 31, 2022			
Description	**Balance Sheet Classification**	**Level 1**	**Level 2**	**Level 3**	**Total Fair Value**
Assets:					
Certificates of deposit	Marketable securities	$ —	$ 2,282	$ —	$ 2,282
Interest rate swaps	Deposits and other assets	—	10,396	—	10,396
Total assets measured at fair value on a recurring basis		$ —	$ 12,678	$ —	$ 12,678
Liabilities:					
Foreign currency forward contracts	Other current liabilities	$ —	35	—	$ 35
Contingent consideration	Other current liabilities	—	—	1,779	1,779
Total liabilities measured at fair value on a recurring basis		$ —	$ 35	$ 1,779	$ 1,814

		December 31, 2021			
Description	**Balance Sheet Classification**	**Level 1**	**Level 2**	**Level 3**	**Total Fair Value**
Assets:					
Certificates of deposit	Marketable securities	$ —	$ 2,296	$ —	$ 2,296
Interest rate swaps	Deposits and other assets	—	2,739	—	2,739
Total assets measured at fair value on a recurring basis		$ —	$ 5,035	$ —	$ 5,035
Liabilities:					
Contingent consideration	Other current liabilities	$ —	$ —	$ 1,738	$ 1,738
Total liabilities measured at fair value on a recurring basis		$ —	$ —	$ 1,738	$ 1,738

The fair value of foreign currency forward contracts is based on the movement in the forward rates of foreign currency cash flows in which the hedging instrument is denominated. We determine the fair value of interest rate swaps by estimating the net present value of the expected cash flows based on market rates and associated yield curves, adjusted for non-performance credit risk, as applicable. See *Note 7. Derivative Financial Instruments* for additional information. The fair value of contingent consideration is determined by estimating the net present value of the expected cash flows based on the probability of expected payment. For all periods presented, there were no transfers into or out of Level 3.

(In thousands, except per share data)

NOTE 7. DERIVATIVE FINANCIAL INSTRUMENTS

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

The following table summarizes the notional amount of outstanding foreign currency forward contracts:

	March 31, 2022	December 31, 2021
Foreign currency forward contracts	$ 63,756	$ —

Gains and losses related to foreign currency exchange contracts were offset by corresponding gains and losses on the revaluation of the underlying assets and liabilities. Both are included as components of other income (expense), net in our Consolidated Statements of Operations.

In April 2020, we executed interest rate swap contracts with independent financial institutions to partially reduce the variability of cash flows in LIBOR indexed debt interest payments on our Term Loan Facility (under our existing Credit Agreement dated September 10, 2019, as amended). These transactions are accounted for as cash flow hedging instruments.

The interest rate swap contracts fixed a portion of the outstanding principal balance on our term loan to a total interest rate of 1.271%. This is comprised of 0.521% average fixed rate per annum in exchange for a variable interest rate based on one-month USD-LIBOR-BBA plus the credit spread in our existing Credit Agreement (see Note 18. *Credit Facility*), which is 75 basis points at current leverage ratios.

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

	March 31, 2022	December 31, 2021
Interest rate swap contracts	$ 251,344	$ 255,719

The following table summarizes the balances recorded in accumulated other comprehensive income (loss) on the Consolidated Balance Sheets for qualifying hedges.

	March 31, 2022	December 31, 2021
Interest rate swap contract gains	$ 7,998	$ 2,107

See *Note 6. Fair Value Measurements* for information regarding fair value of derivative instruments.

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

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
(In thousands, except per share data)

NOTE 8. ACCOUNTS AND OTHER RECEIVABLE, NET

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

	March 31, 2022	December 31, 2021
Amounts billed, net	$ 233,034	$ 217,549
Unbilled receivables	15,698	19,678
Total receivables, net	$ 248,732	$ 237,227

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

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

The following table summarizes the changes in expected credit losses:

December 31, 2021	$ 5,784
Additions	161
Foreign currency translation	2
March 31, 2022	$ 5,947

NOTE 9. INVENTORIES

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

	March 31, 2022	December 31, 2021
Parts and raw materials	$ 273,435	$ 261,365
Work in process	29,393	24,222
Finished goods	57,973	52,823
Total	$ 360,801	$ 338,410

(In thousands, except per share data)

NOTE 10. PROPERTY AND EQUIPMENT, NET

Property and equipment, net is comprised of the following:

	Estimated Useful Life (in years)	March 31, 2022	December 31, 2021
Buildings	25	$ 1,591	$ 1,625
Machinery and equipment	5 to 8	136,610	133,010
Computer equipment, furniture, fixtures, and vehicles	3 to 5	33,806	33,490
Leasehold improvements	2 to 10	49,838	48,370
Construction in process		10,788	5,914
		232,633	222,409
Less: Accumulated depreciation		(115,346)	(107,579)
Property and equipment, net		$ 117,287	$ 114,830

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

	Three Months Ended March 31,	
	2022	2021
Depreciation expense	$ 8,379	$ 7,337

NOTE 11. GOODWILL

The following table summarizes the changes in goodwill:

December 31, 2021	$ 212,190
Measurement period adjustments to purchase price allocations	61
Foreign currency translation	(758)
March 31, 2022	$ 211,493

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

(In thousands, except per share data)

NOTE 12. INTANGIBLE ASSETS

Intangible assets consisted of the following:

	March 31, 2022		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Technology	$ 91,088	$ (38,391)	$ 52,697
Customer relationships	118,181	(35,879)	82,302
Trademarks and other	27,178	(8,569)	18,609
Total	$ 236,447	$ (82,839)	$ 153,608

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

At March 31, 2022, the weighted average remaining useful life of intangibles subject to amortization was approximately 9.6 years.

Amortization expense related to intangible assets is as follows:

	Three Months Ended March 31,	
	2022	2021
Amortization expense	$ 5,509	$ 5,384

Estimated amortization expense related to intangibles is as follows:

Year Ending December 31,	
2022 (remaining)	16,461
2023	21,936
2024	19,105
2025	14,618
2026	12,902
Thereafter	68,586
Total	$ 153,608

(In thousands, except per share data)

NOTE 13. RESTRUCTURING COSTS

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

	Three Months Ended March 31,	
	2022	2021
Severance and related charges	$ 873	$ 404
Facility relocation and closure charges	345	634
Total restructuring charges	$ 1,218	$ 1,038

	Cumulative Cost Through March 31, 2022
Severance and related charges	$ 21,253
Facility relocation and closure charges	7,160
Total restructuring charges	$ 28,413

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

December 31, 2021	$ 9,263
Costs incurred and charged to expense	1,218
Costs paid or otherwise settled	(2,438)
Effects of changes in exchange rate	(3)
March 31, 2022	$ 8,040

NOTE 14. WARRANTIES

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

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

	Three Months Ended March 31, 2022
December 31, 2021	$ 3,350
Increases to accruals	880
Warranty expenditures	(693)
Effect of changes in exchange rates	(7)
March 31, 2022	$ 3,530

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
(In thousands, except per share data)

NOTE 15. LEASES

Components of operating lease cost were as follows:

	Three Months Ended March 31, 2022	Three Months Ended March 31, 2021
Operating lease cost	$ 5,719	$ 5,921
Short-term and variable lease cost	1,090	842
Total operating lease cost	$ 6,809	$ 6,763

Maturities of our operating lease liabilities are as follows:

Year Ending December 31,	
2022 (remaining)	$ 15,589
2023	18,733
2024	16,247
2025	13,280
2026	11,903
Thereafter	66,528
Total lease payments	142,280
Less: Interest	(31,439)
Present value of lease liabilities	$ 110,841

	Three Months Ended March 31, 2022	Three Months Ended March 31, 2021
Weighted average remaining lease term (in years)	9.6	10.6
Weighted average discount rate	4.5 %	4.6 %

	Three Months Ended March 31, 2022	Three Months Ended March 31, 2021
Cash paid for operating leases	$ 5,626	$ 5,958
Right-of-use assets obtained in exchange for operating lease liabilities	$ 4,530	$ 2,192

NOTE 16. STOCK-BASED COMPENSATION

As of March 31, 2022, we had two active stock-based incentive compensation plans: the 2017 Omnibus Incentive Plan ("the 2017 Plan") and the Employee Stock Purchase Plan ("ESPP"). We issue all new equity compensation grants under these two plans; however, outstanding awards previously issued under inactive plans will continue to vest and remain exercisable in accordance with the terms of the respective plans.

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

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
(In thousands, except per share data)

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

	March 31, 2022
Shares available for future issuance under the 2017 Omnibus Incentive Plan	1,629
Shares available for future issuance under the Employee Stock Purchase Plan	665

Restricted stock units ("RSU's") are generally granted with a grant date fair value equal to the market price of our stock on the date of grant and with generally a three year vesting schedule. Certain RSUs contain performance-based or market-based vesting conditions in addition to the time based requirements.

Stock option awards are generally granted with an exercise price equal to the market price of our stock on the date of grant and with either a three or four-year vesting schedule or performance-based vesting as determined at the time of grant. Stock option awards generally have a term of 10 years.

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

	Three Months Ended March 31,	
	2022	2021
Equity classified awards	$ 3,906	$ 5,701
Liability classified awards	22	—
Stock-based compensation expense	$ 3,928	$ 5,701

Changes in our RSUs were as follows:

	Three Months Ended March 31, 2022	
	Number of RSUs	Weighted-Average Grant Date Fair Value
RSUs outstanding at beginning of period	627	$ 76.37
RSUs granted	361	$ 73.79
RSUs vested	(82)	$ 76.55
RSUs forfeited	(176)	$ 54.71
RSUs outstanding at end of period	730	$ 80.31

Changes in our stock options were as follows:

	Three Months Ended March 31, 2022	
	Number of Options	Weighted-Average Exercise Price per Share
Options outstanding at beginning of period	112	$ 24.41
Options granted	76	$ 85.97
Options outstanding at end of period	188	$ 49.12

(In thousands, except per share data)

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 patent litigation also could require material changes in production processes and products or result in our inability to ship products or components found to have violated third-party patent rights. We accrue loss contingencies in connection with our commitments and contingencies, including litigation, when it is probable that a loss has occurred, and the amount of the loss can be reasonably estimated. We are not currently a party to any legal action that we believe would reasonably have a material adverse impact on its business, financial condition, results of operations or cash flows.

NOTE 18. CREDIT FACILITY

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

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

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

	March 31, 2022		
	Balance	Interest Rate	Unused Line Fee
Term Loan Facility subject to a fixed interest rate	$ 251,344	1.271%	—
Term Loan Facility subject to a variable interest rate	138,656	1.207%	—
Revolving Facility subject to a variable interest rate	—	1.207%	0.10%
Total borrowings under the Credit Agreement	$ 390,000		

For more information on the interest rate swap that fixes the interest rate for a portion of our Term Loan Facility, see *Note 7. Derivative Financial Instruments*. The Term Loan Facility and Revolving Facility bear interest, at our option, at a rate based on a reserve adjusted "Eurodollar Rate" or "Base Rate," as defined in the Credit Agreement, plus an applicable margin.

For all periods presented, we were in compliance with the Credit Agreement covenants. The following table summarizes our availability to withdraw on the Revolving Facility.

	March 31, 2022	December 31, 2021
Available capacity on Revolving Facility	$ 200,000	$ 200,000

The fair value of the Term Loan Facility approximates the outstanding balance of $390.0 million as of March 31, 2022.

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
(In thousands, except per share data)

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

	March 31, 2022	December 31, 2021
Term Loan Facility	$ 390,000	$ 395,000
Less: debt issuance costs	(2,132)	(2,267)
Total debt	387,868	392,733
Less current portion of long-term debt	(20,000)	(20,000)
Total long-term debt	$ 367,868	$ 372,733

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

Year Ending December 31,	
2022 (remaining)	$ 15,000
2023	20,000
2024	20,000
2025	20,000
2026	315,000
Total	$ 390,000

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

	Three Months Ended March 31,	
	2022	2021
Interest expense	$ 1,123	$ 985
Amortization of debt issuance costs	135	126
Unused line of credit fees and other	54	37
Total interest expense	$ 1,312	$ 1,148

NOTE 19. SUBSEQUENT EVENT

On April 1, 2022, we entered into a definitive agreement to acquire 100% of the issued and outstanding shares of capital stock of SL Power Electronics Corporation, a Delaware corporation, for a purchase price of $144.5 million in cash. This amount is subject to customary adjustments for net working capital and other items. This transaction closed on April 25, 2022.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

This management discussion and analysis should be read in conjunction with our Annual Report on Form 10-K for the year ended December 31, 2021, which was filed with the SEC on March 16, 2022.

Special Note on Forward-Looking Statements

This Quarterly Report on Form 10-Q 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. 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, or circumstances will continue. The inclusion of words such as "anticipate," "expect," "estimate," "can," "may," "might," "continue," "enables," "plan," "intend," "should," "could," "would," "likely," "potential," or "believe," as well as statements that events or circumstances "will" occur or continue, indicate 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:

- global risks, including geopolitical instability, actions of governments, economic volatility, terrorism, disease outbreaks, or foreign currency fluctuations or pricing controls;
- our future sales;
- managing backlog orders;
- our ability to be successful in the design win process with our customers;
- our future gross profit;
- our competition;
- market acceptance of, and demand for, our products;
- the fair value of our assets and financial instruments;
- research and development expenses;
- selling, general, and administrative expenses;
- sufficiency and availability of materials;
- sufficiency and availability of capital resources;
- capital expenditures;
- our production and factory strategy;
- our share repurchase program;
- our tax assets and liabilities;
- our other commitments and contingent liabilities;
- adequacy of our reserve for excess and obsolete inventory;
- adequacy of our warranty reserves;

- our estimates of the fair value of assets acquired;
- restructuring activities and expenses;
- the impact of changes in interest rates or inflation;
- unanticipated costs in fulfilling our warranty obligations for solar inverters;
- the integration of our acquisitions;
- general global political and economic conditions;
- industry trends;
- our acquisition, divestiture, and joint venture activities;
- cost fluctuations and pressures, including prices of components, commodities and raw materials, and costs of labor, transportation, energy, pension, and healthcare; and
- the ability to stay on the leading edge of innovation, obtain and defend necessary intellectual property protections.

Actual results could differ materially and adversely from those expressed in any forward-looking statements. Neither we nor any other person assumes responsibility for the accuracy and completeness of such forward-looking statements and readers are cautioned not to place undue reliance on forward-looking statements.

For additional information regarding factors that may affect our actual financial condition, results of operations and accuracy of our forward-looking statements, see the information under the caption "Risk Factors" in Part II, Item 1A of this Quarterly Report on Form 10-Q and, in Part I, Item 1A in our Annual Report on Form 10-K for the year ended December 31, 2021. We undertake no obligation to revise or update any forward-looking statements for any reason.

BUSINESS AND MARKET OVERVIEW

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

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

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

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

Looking forward, we expect that for the remainder of 2022 customer demand will remain strong across our served markets; however, our ability to procure critical components to meet our customers' needs will continue to be limited by the ongoing constraints in the global supply chain. These supply constraints have led to longer lead times in procuring materials and subcomponents and, in some cases, higher costs and inventory level requirements. We have implemented measures to improve supply of critical materials and components and to mitigate the impact of these higher input costs and believe that our higher levels of inventory are well matched to meet our customer demand. However, it is not clear how long this supply chain condition will continue, how quickly it may recover, or the extent to which our mitigating actions will be able to compensate for our higher costs. As such, our forward-looking projections of revenues, earnings, and cash flow may be adversely impacted if the situation continues or further deteriorates.

For additional discussion on the potential impacts of COVID-19 to the future operations of our business, please see the information under the caption "Risk Factors" in Part II, in Item 1A of this Quarterly Report on Form 10-Q and Part I, Item 1A in our Annual Report on Form 10-K for the year ended December 31, 2021.

Semiconductor Equipment Market

Growth in the Semiconductor Equipment market is driven by growing integrated circuits content across many industries, increased demand for processing and storage in advanced applications such as artificial intelligence, cloud computing, and autonomous vehicles, and the rapid adoption of advanced mobile connectivity solutions such as 5G, which enhances existing and enables new wireless applications. To address the long-term growing demand for semiconductor devices, the industry continues to invest in production capacities for both leading-edge and trailing-edge nodes, logic devices, the latest memory devices including 3D-NAND, DRAM, and new emerging memories such as MRAM, and back-end test and advanced wafer-level packaging. The industry's transition to advanced technology nodes in logic and DRAM and to increased layers in 3D NAND memory devices require an increased number of plasma-based etch and deposition process tools and higher content of our advanced power solutions per tool. As etching and deposition processes become more challenging due to increasing aspect ratios in advanced 3D devices, more advanced RF, and direct current ("DC") technologies are needed. We strive to meet these challenges by providing a broader range of more complex RF and DC power solutions. Beyond etch and deposition processes, the growing complexity at the advanced nodes also drive a higher number of other processes across the wafer fab, including inspection, metrology, thermal, ion implantation, and semiconductor test, where Advanced Energy is actively participating as a critical technology provider. In addition, our global support services group offers comprehensive local repair service, upgrade, and retrofit offerings to extend the useable life of our customers' capital equipment for additional technology generations. Our strategy in the Semiconductor Equipment market is to defend our proprietary positions in our core applications, grow our market position in applications where we have lower share, including remote plasma source and dielectric etch, and leverage our product portfolio in areas such as embedded power, high voltage power system, and critical sensing and controls to grow our share and contents at our key Original Equipment Manufacturer ("OEM") customers.

The Semiconductor Equipment market has experienced continued demand growth since 2019, which has been driven by higher semiconductor contents across many industries, increased capital intensity at the leading-edge process nodes, semiconductor device makers investing in the trailing-edge nodes due to supply constraints, and increased regional investments of semiconductor capacities. Advanced Energy participated in this market growth by delivering record revenue from the Semiconductor Equipment market in 2021 and in the first quarter of 2022, even with the negative impact of the global supply constraints. Throughout the remainder of 2022, we expect increased demand as chipmakers invest in new fab capacities, driven by growing demand for semiconductor devices for a wide range of applications, the continued transition to next generation processing nodes, and the need to resolve supply constraints in the industry. As a result, we expect to continue to invest in both increasing our capacity and capability to meet market demand for our products.

Industrial and Medical Markets

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

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

Advanced Energy serves the Industrial and Medical market with mission-critical power components that deliver high reliability, precise, low noise or differentiated power to the equipment they serve. Examples of products sold into the Industrial and Medical market include high voltage products and low voltage power supplies used in applications for medical devices, analytical instruments, test and measurement, medical lasers, scientific instrumentation and industrial equipment, and power control modules and thermal instrumentation products for material fabrication, processing, and treatment. Growth in the Industrial and Medical market is being driven by the overall macro-economic growth investments in complex manufacturing processes or automation, increased adoption of smart solutions across many industrial applications, new investments in clean and sustainable technologies, and growing investments in medical devices and life science equipment. Our strategy in the Industrial and Medical market is to expand our product offerings and channel reach, leveraging common platforms, derivatives, and customizations to further penetrate a broader set of applications, such as medical, test and measurement, horticulture, and many other industrial applications.

During 2021 and the first quarter 2022, we saw improvement in the Industrial and Medical market as global economic growth resumed and our customers were able to increase capacity. In the first three months of 2022, overall customer demand increased compared to the same period in the prior year, but supply constraints of critical components limited our ability to ship product at the level of customer demand. We expect demand in the Industrial and Medical market to continue to grow in the remainder of 2022, but product delivery will be dependent on resolving our supply constraint condition. It is not clear how long these supply shortages will persist or on what timelines our supply may recover.

Data Center Computing Markets

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

Customer demand for our products has risen during the past two years as COVID-19 accelerated demand for cloud and network applications. However, our 2021 revenue declined year over year due to the limited availability of parts given global supply constraints, which prevented us from producing products to meet the growing customer demand. Revenue in this market in the first quarter increased compared to the same period in the prior year as our demand grew, but the supply constraint condition has extended into the year, impacting our ability to ship to customer demand. It is not clear how long these supply shortages will persist or how quickly our supply may recover.

With a growing presence at both cloud service providers and industry-leading data center server and storage vendors, we believe Advanced Energy is well positioned to continue to capitalize on the ongoing shift towards cloud and edge computing from enterprise on-premises computing. Our strategy in the Data Center Computing market is to penetrate additional customers and applications based on our differentiated capability and competitive strengths in power density, efficiency, and controls.

Telecom and Networking Markets

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

During 2021, revenue declined on an annual basis as a result of the limited availability of parts given global supply constraints and our internal decision to optimize our portfolio toward higher margin applications for the Telecom and Networking market. Revenue has increased in the first quarter of 2022 compared to the same period in the prior year due to increased customer demand. For the remainder of 2022, we expect demand in this market to continue to recover, driven by increased investments in 5G infrastructure in the U.S. and Europe, but the supply constraint condition continues to negatively impact our ability to ship product at the level of customer demand. It is not clear how long these supply shortages will persist or how quickly our supply may recover.

Results of Continuing Operations

The analysis presented below is organized to provide the information we believe will be helpful for understanding of our historical performance and relevant trends going forward and should be read in conjunction with our "Unaudited Consolidated Financial Statements" in Part I, Item 1 of this report, including the notes thereto. Also included in the following analysis are measures that are not in accordance with U.S. GAAP. A reconciliation of the non-GAAP measures to U.S. GAAP is provided below.

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

	Three Months Ended March 31, 2022	Three Months Ended March 31, 2021
Sales	$ 397,459	$ 351,620
Gross profit	144,316	137,503
Operating expenses	99,659	93,321
Operating income from continuing operations	44,657	44,182
Other income (expense), net	(842)	(507)
Income from continuing operations before income taxes	43,815	43,675
Provision for income taxes	6,953	5,284
Income from continuing operations, net of income taxes	$ 36,862	$ 38,391

	Three Months Ended March 31, 2022	Three Months Ended March 31, 2021
Sales	100.0 %	100.0 %
Gross profit	36.3	39.1
Operating expenses	25.1	26.5
Operating income from continuing operations	11.2	12.6
Other income (expense), net	(0.2)	(0.1)
Income from continuing operations before income taxes	11.0	12.4
Provision for income taxes	1.7	1.5
Income from continuing operations, net of income taxes	9.3 %	10.9 %

SALES, NET

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

	Three Months Ended March 31,		Change 2022 v. 2021	
	2022	2021	Dollar	Percent
Semiconductor Equipment	$ 202,957	$ 180,716	$ 22,241	12.3 %
Industrial and Medical	82,898	78,415	4,483	5.7
Data Center Computing	76,238	59,154	17,084	28.9
Telecom and Networking	35,366	33,335	2,031	6.1
Total	$ 397,459	$ 351,620	$ 45,839	13.0 %

	Three Months Ended March 31, 2022	Three Months Ended March 31, 2021
Semiconductor Equipment	51.1 %	51.4 %
Industrial and Medical	20.9	22.3
Data Center Computing	19.2	16.8
Telecom and Networking	8.9	9.5
Total	100.0 %	100.0 %

OPERATING EXPENSES

The following tables summarize our operating expenses (in thousands) and as a percentage of sales:

	Three Months Ended March 31,			
	2022		2021	
Research and development	$ 43,614	11.0 %	$ 40,168	11.4 %
Selling, general, and administrative	49,318	12.4	46,731	13.3
Amortization of intangible assets	5,509	1.4	5,384	1.5
Restructuring charges	1,218	0.3	1,038	0.3
Total operating expenses	$ 99,659	25.1 %	$ 93,321	26.5 %

SALES

Sales increased $45.8 million, or 13.0%, to $397.5 million for the three months ended March 31, 2022, as compared to $351.6 million during the same period in the prior year. The increase in sales was primarily due to increased demand and shipments in the Semiconductor Equipment and Data Center Computing markets. Sales in the Industrial and Medical and Telecom and Networking markets also increased. Revenues in the first quarter of 2022 continued to be constrained across all of our markets by supply chain shortages for certain integrated circuits and other components, which limited our ability to ship to meet our total demand. As a result, backlog increased to $1.0 billion from $927.8 million in the fourth quarter of 2021 and from $405.7 million in the first quarter of 2021.

Sales in the Semiconductor Equipment market increased $22.2 million, or 12.3%, to $203.0 million for the three months ended March 31, 2022, as compared to $180.7 million during the same period in the prior year. The increase in sales during 2022 is primarily due to an overall increase in demand in the semiconductor equipment market, increasing power content in semiconductor manufacturing tools, market share gains in selected areas, and expansion of our product portfolio, along with improving parts availability.

Sales in the Industrial and Medical market increased $4.5 million, or 5.7%, to $82.9 million for the three months ended March 31, 2022, as compared to $78.4 million during the same period in the prior year. Our customers in this market are primarily global and regional original equipment and device manufacturers. The increase in sales relative to the same period in the prior year was primarily due to improving macroeconomic conditions and the continued recovery from the COVID-19 pandemic driving stronger demand.

Sales in the Data Center Computing market increased $17.1 million, or 28.9%, to $76.2 million for the three months ended March 31, 2022, as compared to $59.2 million during the same period in the prior year. The increase in Data Center Computing market sales is due in part to digestion of equipment at key accounts in early 2021 and better supply availability, which enabled us to partially ship against more normalized customer demand.

Sales in the Telecom and Networking market increased $2.0 million, or 6.1%, to $35.4 million for the three months ended March 31, as compared to $33.3 million during the same period in the prior year. The increase in sales was due to in part to our decision to optimize our product portfolio towards higher margin applications and production limitations due to supply constraints, which impacted our revenue in the first quarter of 2021. Over time, we expect that 5G infrastructure investments and upgrades to enterprise networks will drive growth in this market.

Backlog

The following table summarizes our backlog (in thousands):

	March 31, 2022	December 31, 2021	Change	
			Dollar	Percent
Backlog	$ 1,012,432	$ 927,810	$ 84,622	9.1 %

Our backlog at any particular date is not necessarily indicative of actual sales which may be generated for any succeeding period.

GROSS PROFIT

For the three months ended March 31, 2022, gross profit increased $6.8 million to $144.3 million, or 36.3% of revenue, as compared to $137.5 million, or 39.1% of revenue, in the same period in the prior year. The decrease in gross profit as a percent of revenue is largely related to higher material and freight costs. Additional drivers of our decrease in gross profit include productivity inefficiencies resulting from supply constraints, COVID-19 capacity restrictions, and the transition of our Shenzhen, Peoples Republic of China ("PRC") manufacturing to Penang, Malaysia. These factors were partly offset by increased volume and favorable product mix.

OPERATING EXPENSE

Research and Development

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

Research and development expenses increased $3.4 million to $43.6 million for the three months ended March 31, 2022, as compared to $40.2 million during the same period in the prior year. The increase in research and development expense is related to increased headcount and associated costs, outside technical services, and engineering materials as we invested in new programs to maintain and increase our technological leadership and provide solutions to our customers' evolving needs.

Selling, General and Administrative

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

Selling, general and administrative ("SG&A") expenses increased $2.6 million to $49.3 million for the three months ended March 31, 2022, as compared to $46.7 million in the same period in the prior year. The increase in SG&A for the three-month period ended March 31, 2022, is principally related to acquisition related activity, sales commissions driven by higher revenue, an increase in headcount, and an increase in variable compensation.

Amortization of Intangibles

Amortization expense increased $0.1 million to $5.5 million during the three months ended March 31, 2022, as compared to $5.4 million during the same period in the prior year. The increase is primarily driven by incremental amortization of newly acquired intangible assets. For additional information, see *Note 12. Intangible Assets* in Part I, Item 1 "Unaudited Consolidated Financial Statements."

Restructuring

Restructuring charges relate to previously announced management plans to optimize our manufacturing footprint to lower cost regions, improvements in operating efficiencies, and synergies related to acquisitions. For additional information, see *Note 13. Restructuring Costs* in Part I, Item 1 "Unaudited Consolidated Financial Statements."

OTHER INCOME (EXPENSE), NET

Other income (expense), net consists primarily of interest income and expense, foreign exchange gains and losses, gains and losses on sales of fixed assets, and other miscellaneous items.

For the three months ended March 31, 2022, other income (expense), net increased ($0.3) million to ($0.8) million, as compared to other income (expense), net of ($0.5) million for the same period in the prior year. The increase in expense between periods is primarily due to increased interest expense related to our term note because of higher borrowing levels following the extension of our debt agreement last year and higher interest rates. For additional details see *Note 18. Credit Facility* in Part I, Item 1 "Unaudited Consolidated Financial Statements."

PROVISION FOR INCOME TAXES

The following table summarizes tax expense (in thousands) and the effective tax rate for our income from continuing operations:

	Three Months Ended March 31,	
	2022	**2021**
Income from continuing operations, before income taxes	$ 43,815	$ 43,675
Provision for income taxes	$ 6,953	$ 5,284
Effective tax rate	15.9 %	12.1 %

Our effective tax rates differ from the U.S. federal statutory rate of 21% for the three months ended March 31, 2022 and 2021, respectively, primarily due to 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. The effective tax rate for the first three months of 2022 was higher than the same period in 2021 primarily due to the January 1, 2022 effective date of certain provision enacted as part of the 2017 Tax Cuts and Jobs Act.

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

Non-GAAP Results

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

The non-GAAP results presented below exclude the impact of non-cash related charges, such as stock-based compensation, amortization of intangible assets, and non-economic foreign exchange gains/losses. In addition, they exclude discontinued operations and other non-recurring items such as acquisition-related costs and restructuring expenses, as they are not indicative of future performance. The tax effect of our non-GAAP adjustments represents the anticipated annual tax rate applied to each non-GAAP adjustment after consideration of their respective book and tax treatments and effect of adoption of the 2017 Tax Cuts and Jobs Act.

Reconciliation of non-GAAP measure - operating expenses and operating income from continuing operations, excluding certain items (in thousands)	**Three Months Ended March 31,**	
	2022	**2021**
Gross profit from continuing operations, as reported	$ 144,316	$ 137,503
Adjustments to gross profit:		
Stock-based compensation	231	350
Facility expansion, relocation costs and other	1,284	1,838
Acquisition-related costs	(502)	8
Non-GAAP gross profit	145,329	139,699
Non-GAAP gross margin	36.6%	39.7%
Operating expenses from continuing operations, as reported	99,659	93,321
Adjustments:		
Amortization of intangible assets	(5,509)	(5,384)
Stock-based compensation	(3,697)	(5,351)
Acquisition-related costs	(1,668)	(2,028)
Facility expansion, relocation costs and other	—	(51)
Restructuring charges	(1,218)	(1,038)
Non-GAAP operating expenses	87,567	79,469
Non-GAAP operating income	$ 57,762	$ 60,230
Non-GAAP operating margin	14.5%	17.1%

Reconciliation of non-GAAP measure - income from continuing operations, excluding certain items (in thousands, except per share amounts)	**Three Months Ended March 31,**	
	2022	**2021**
Income from continuing operations, less non-controlling interest, net of income taxes	$ 36,876	$ 38,358
Adjustments:		
Amortization of intangible assets	5,509	5,384
Acquisition-related costs	1,166	2,036
Facility expansion, relocation costs, and other	1,284	1,889
Restructuring charges	1,218	1,038
Unrealized foreign currency (gain) loss	(1,285)	(2,202)
Acquisition-related costs and other included in other income (expense), net	—	87
Tax effect of non-GAAP adjustments	(1,069)	(1,284)
Non-GAAP income, net of income taxes, excluding stock-based compensation	43,699	45,306
Stock-based compensation, net of taxes	3,025	4,362
Non-GAAP income, net of income taxes	$ 46,724	$ 49,668
Non-GAAP diluted earnings per share	$ 1.24	$ 1.29

Impact of Inflation

In previous years, inflation has not had a significant impact on our operations. However, more recently we are experiencing price increases in select components driven by higher global demand, supply chain disruptions, higher labor expenses, and increased freight costs. We continuously monitor operating price increases, particularly in connection with the supply of component parts used in our manufacturing process. To the extent permitted by competition, we pass increased costs on to our customers by increasing sales prices over time. From time to time, we may also reduce prices to customers based on reductions in the cost structure of our products from cost improvement initiatives and decreases in component part prices**.**

Liquidity and Capital Resources

Liquidity

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

The following table summarizes our cash, cash equivalents, and marketable securities (in thousands):

	March 31, 2022
Cash and cash equivalents	$ 521,236
Marketable securities	2,282
Total cash, cash equivalents, and marketable securities	$ 523,518

We believe the above sources of liquidity will be adequate to meet anticipated working capital needs, anticipated levels of capital expenditures, contractual obligations, debt repayment, share repurchase programs, and dividends for the next twelve months and on a long-term basis. In addition, we may, depending upon the number or size of additional acquisitions, seek additional debt or equity financing from time to time; however, such additional financing may not be available on acceptable terms, if at all.

Credit Facility

For information on our Credit Facility, see *Note 18. Credit Facility* and *Note 7. Derivative Financial Instruments* in Part I, Item 1 "Unaudited Consolidated Financial Statements."

The following table summarizes borrowings under our Credit Facility and the associated interest rate (in thousands, except for interest rates).

	March 31, 2022		
	Balance	Interest Rate	Unused Line Fee
Term Loan Facility subject to a fixed interest rate	$ 251,344	1.271%	—
Term Loan Facility subject to a variable interest rate	138,656	1.207%	—
Revolving Facility subject to a variable interest rate	—	1.207%	0.10%
Total borrowings under the Credit Agreement	$ 390,000		

As of March 31, 2022, we had $200.0 million in available funding under the Revolving Facility. The Term Loan Facility requires quarterly repayments of $5.0 million plus accrued interest, with the remaining balance due in September 2026.

Dividends

In March 2021, the Board of Directors (the "Board") declared the first quarterly cash dividend since our inception as a public company. During the three months ended March 31, 2022, we paid a quarterly cash dividend of $0.10 per share totaling $3.8 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 and will depend on our financial condition, results of operations, capital requirements, business conditions, and other factors.

Share Repurchase

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

(in thousands, except per share amounts)	**Three Months Ended March 31, 2022**	**Three Months Ended March 31, 2021**
Amount paid to repurchase shares	$ 6,594	$ —
Number of shares repurchased	82	—
Average repurchase price per share	$ 80.02	$ —
Remaining authorized by Board of Directors for future repurchases as of period end	$ 121,783	$ 38,369

Cash Flows

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

	Three Months Ended March 31, 2022	**Three Months Ended March 31, 2021**
Net cash from operating activities from continuing operations	$ 9,913	$ 54,264
Net cash from operating activities from discontinued operations	(92)	(185)
Net cash from operating activities	9,821	54,079
Net cash from investing activities from continuing operations	(13,675)	(12,415)
Net cash from financing activities from continuing operations	(17,813)	(12,443)
Effect of currency translation on cash and cash equivalents	(1,469)	321
Net change in cash and cash equivalents	(23,136)	29,542
Cash and cash equivalents, beginning of period	544,372	480,368
Cash and cash equivalents, end of period	$ 521,236	$ 509,910

Net Cash From Operating Activities

Net cash from operating activities from continuing operations for the three months ended March 31, 2022, was $9.9 million, as compared to $54.3 million for the same period in the prior year. The decrease of $44.4 million in net cash flows from operating activities as compared to the same period in the prior year is due to an unfavorable increase in net operating assets driven primarily by our increased investment in inventory as we attempted to mitigate supply chain constraints.

Net Cash From Investing Activities

Net cash from investing activities for the three months ended March 31, 2022 was ($13.7) million, driven by the following:

- ($13.1) million in purchases of property and equipment largely driven by investments in our manufacturing footprint and capacity; and
- ($0.6) million for business combinations.

Net cash from investing for the three months ended March 31, 2021 was ($12.4) million, driven by the following:

- ($8.8) million in purchases of property and equipment largely driven by investments in our manufacturing footprint and capacity; and
- ($3.6) million for business combinations

Net Cash From Financing Activities

Net cash from financing activities for the three months ended March 31, 2022 was ($17.8) million and included the following:

- ($6.6) million related to repurchases of our common stock;
- ($5.0) million for repayment of long-term debt;
- ($3.8) million for dividend payments; and
- ($2.4) million in net payments related to stock-based award activities.

Net cash from financing activities for the three months ended March 31, 2021 was ($12.4) million and included the following:

- ($4.4) million for repayment of long-term debt;
- ($4.2) million in net payments related to stock-based award activities; and
- ($3.9) million of dividend payments.

Effect of Currency Translation on Cash

During the three months ended March 31, 2022, currency translation had an unfavorable impact primarily due to a stronger U.S. dollar. See "Foreign Currency Exchange Rate Risk" in Part I, Item 3 of this Form 10-Q for more information**.**

Critical Accounting Policies and Estimates

The preparation of financial statements and related disclosures in conformity with U.S. GAAP requires us to make judgments, assumptions and estimates that affect the amounts reported in the consolidated financial statements and accompanying notes. *Note 1. Operation and Summary of Significant Accounting Policies and Estimates* to the consolidated financial statements in our Annual Report on Form 10-K for the year ended December 31, 2021, describes the significant accounting policies and methods used in the preparation of our consolidated financial statements. Our critical accounting estimates, discussed in the "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part II, Item 7 of our Annual Report on Form 10-K for the year ended December 31, 2021, include:

- estimates for the valuation of assets and liabilities acquired in business combinations;
- accounting for income taxes;
- inputs to actuarial models that measure our pension obligations; and
- assessing excess and obsolete inventories.

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.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market Risk and Risk Management

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

See the "Risk Factors" set forth in Part I, Item 1A of our Annual Report on Form 10-K and Part II, Item 1A of this Form 10-Q for more information about the market risks to which we are exposed. There have been no material changes in our exposure to market risk from December 31, 2021.

Foreign Currency Exchange Rate Risk

We are impacted by changes in foreign currency exchange rates through sales and purchasing transactions when we sell products and purchase materials in currencies different from the currency in which product and manufacturing costs were incurred.

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

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

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

As currencies fluctuate against each other we are exposed to foreign currency exchange rate risk on sales, purchasing transactions, and labor. Exchange rate fluctuations could require us to increase prices to foreign customers, which could result in lower net sales. Alternatively, if we do not adjust the prices for our products in response to unfavorable currency fluctuations, our results of operations could be adversely impacted. Changes in the relative buying power of our customers may impact sales volumes.

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

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

Interest Rate Risk

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

	March 31, 2022		
	Balance	Interest Rate	Unused Line Fee
Term Loan Facility subject to a fixed interest rate	$ 251,344	1.271%	—
Term Loan Facility subject to a variable interest rate	138,656	1.207%	—
Revolving Facility subject to a variable interest rate	—	1.207%	0.10%
Total borrowings under the Credit Agreement	$ 390,000		

For more information on the Term Loan Facility see *Note 18. Credit Facility* in Part I, Item 1 "Unaudited Consolidated Financial Statements." For more information on the interest rate swap that fixes the interest rate for a portion of our Term Loan Facility, see *Note 7. Derivative Financial Instruments* in Part I, Item 1 "Unaudited Consolidated Financial Statements." The Term Loan Facility and Revolving Facility bear interest, at our option, at a rate based on a reserve adjusted "Eurodollar Rate" or "Base Rate," as defined in the Credit Agreement, plus an applicable margin.

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

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

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

As of the end of the period covered by this report, we conducted an evaluation, with the participation of management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of the disclosure controls and procedures pursuant to the Exchange Act Rule 13a-15(b). Based upon this evaluation, the Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of March 31, 2022. The conclusions of the Chief Executive Officer and Chief Financial Officer from this evaluation were communicated to the Audit Committee. We intend to continue to review and document our disclosure controls and procedures, including our internal controls over financial reporting, and may from time to time make changes aimed at enhancing their effectiveness and to ensure that our systems evolve with our business.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting that occurred during the quarter covered by this Form 10-Q that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

We are involved in disputes and legal actions arising in the normal course of our business. Since December 31, 2021, there have been no material developments in legal proceedings in which we are involved. For a description of previously reported legal proceedings refer to Part I, Item 3, "Legal Proceedings" of our Annual Report on Form 10-K for the year ended December 31, 2021.

ITEM 1A. RISK FACTORS

This Quarterly Report on Form 10-Q should be read in conjunction with the risk factors discussed in Part I, Item 1A, "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2021, which details risks that could materially affect our business, financial condition, or future results. The risks described in our Annual Report on Form 10-K are not the only risks that we face; additional risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition, or operating results. There have been no material changes to the risk factors previously disclosed in our Annual Report on Form 10-K.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

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

Month	Total Number of Shares Purchased	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs
	(in thousands, except price per share data)			
January	82	$ 80.02	82	$ 121,783
February	—	$ —	—	$ 121,783
March	—	$ —	—	$ 121,783
First quarter	82	$ 80.02	82	

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

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

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None

ITEM 4. MINE SAFETY DISCLOSURES

None

ITEM 5. OTHER INFORMATION

None

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ITEM 6. EXHIBITS

The exhibits listed in the following index are filed as part of this Quarterly Report on Form 10-Q.

Exhibit Number	Description	Incorporated by Reference Form	File No.	Exhibit	Filing Date
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 Chief 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
101.INS	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.				Filed herewith
101.SCH	Inline XBRL Taxonomy Extension Schema Document.				Filed herewith
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.				Filed herewith
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.				Filed herewith
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document.				Filed herewith
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.				Filed herewith
104	Cover Page Interactive Data File – formatted in Inline XBRL and contained in Exhibit 101				Filed herewith

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

ADVANCED ENERGY INDUSTRIES, INC.

Dated: May 4, 2022

/s/ Paul Oldham
Paul Oldham
Chief Financial Officer and Executive Vice President

EXHIBIT 31.1

I, Stephen D. Kelley, certify that:

1. I have reviewed this quarterly report on Form 10-Q for the period ended March 31, 2022 of Advanced Energy Industries, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

    c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: May 4, 2022

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

EXHIBIT 31.2

I, Paul Oldham, certify that:

1. I have reviewed this quarterly report on Form 10-Q for the period ended March 31, 2022 of Advanced Energy Industries, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

   c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: May 4, 2022

/s/ Paul Oldham

Paul Oldham
Chief Financial Officer & Executive Vice President

EXHIBIT 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

I hereby certify, pursuant to 18 U.S.C. Section 1350, that the accompanying Quarterly Report on Form 10-Q for the period ended March 31, 2022, of Advanced Energy Industries, Inc., fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that information contained in the Quarterly Report on Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of Advanced Energy Industries, Inc.

Date: May 4, 2022

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

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

EXHIBIT 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

I hereby certify, pursuant to 18 U.S.C. Section 1350, that the accompanying Quarterly Report on Form 10-Q for the period ended March 31, 2022, of Advanced Energy Industries, Inc., fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that information contained in the Quarterly Report on Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of Advanced Energy Industries, Inc.

Date: May 4, 2022

/s/ Paul Oldham
Paul Oldham
Chief Financial Officer & Executive Vice President

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.