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 September 30, 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 October 27, 2022, there were 37,383,115 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)

	September 30, 2022	December 31, 2021
ASSETS		
Current assets:		
Cash and cash equivalents	$ 409,053	$ 544,372
Accounts and other receivable, net	307,018	237,227
Inventories	409,422	338,410
Other current assets	56,289	42,225
Total current assets	1,181,782	1,162,234
Property and equipment, net	136,502	114,830
Operating lease right-of-use assets	102,226	101,769
Deposits and other assets	33,364	19,669
Goodwill	279,226	212,190
Intangible assets, net	195,807	159,406
Deferred income tax assets	45,148	47,242
TOTAL ASSETS	$ 1,974,055	$ 1,817,340
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 219,770	$ 193,708
Income taxes payable	33,040	9,226
Accrued payroll and employee benefits	74,035	55,833
Other accrued expenses	44,898	53,445
Customer deposits and other	24,913	22,141
Current portion of long-term debt	20,000	20,000
Current portion of operating lease liabilities	16,299	15,843
Total current liabilities	432,955	370,196
Long-term debt, net	358,132	372,733
Operating lease liabilities	94,575	95,180
Pension benefits	58,208	67,255
Deferred income tax liabilities	9,194	9,921
Other long-term liabilities	31,043	30,559
Total liabilities	984,107	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; 37,393 and 37,589 issued and outstanding at September 30, 2022 and December 31, 2021, respectively	37	38
Additional paid-in capital	128,079	115,706
Accumulated other comprehensive loss	(14,797)	(1,216)
Retained earnings	875,968	756,323
Advanced Energy stockholders' equity	989,287	870,851
Noncontrolling interest	661	645
Total stockholders' equity	989,948	871,496
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	$ 1,974,055	$ 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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Sales, net	$ 516,274	$ 346,093	$ 1,354,682	$ 1,059,024
Cost of sales	325,056	226,054	856,990	666,449
Gross profit	191,218	120,039	497,692	392,575
Operating expenses:				
Research and development	49,760	40,578	141,383	120,865
Selling, general, and administrative	56,716	48,373	161,056	143,214
Amortization of intangible assets	7,049	5,607	19,081	16,504
Restructuring expense	121	1,272	1,178	2,521
Total operating expenses	113,646	95,830	322,698	283,104
Operating income	77,572	24,209	174,994	109,471
Other income (expense), net	8,940	495	11,347	(3,674)
Income from continuing operations, before income taxes	86,512	24,704	186,341	105,797
Provision for income taxes	11,639	3,657	29,795	10,817
Income from continuing operations	74,873	21,047	156,546	94,980
Income (loss) from discontinued operations, net of income taxes	(697)	(37)	(615)	171
Net income	$ 74,176	$ 21,010	$ 155,931	$ 95,151
Income from continuing operations attributable to noncontrolling interest	9	6	16	70
Net income attributable to Advanced Energy Industries, Inc.	$ 74,167	$ 21,004	$ 155,915	$ 95,081
Basic weighted-average common shares outstanding	37,379	38,183	37,482	38,296
Diluted weighted-average common shares outstanding	37,630	38,363	37,725	38,517
Earnings per share:				
Continuing operations:				
Basic earnings per share	$ 2.00	$ 0.55	$ 4.18	$ 2.48
Diluted earnings per share	$ 1.99	$ 0.55	$ 4.15	$ 2.46
Discontinued operations:				
Basic earnings (loss) per share	$ (0.02)	$ —	$ (0.02)	$ —
Diluted earnings (loss) per share	$ (0.02)	$ —	$ (0.02)	$ —
Net income:				
Basic earnings per share	$ 1.98	$ 0.55	$ 4.16	$ 2.48
Diluted earnings per share	$ 1.97	$ 0.55	$ 4.13	$ 2.47

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 September 30, 2022	Three Months Ended September 30, 2021	Nine Months Ended September 30, 2022	Nine Months Ended September 30, 2021
Net income	$ 74,176	$ 21,010	$ 155,931	$ 95,151
Other comprehensive income (loss), net of income taxes				
Foreign currency translation	(11,671)	(3,661)	(24,442)	(9,534)
Change in fair value of cash flow hedges	2,508	172	10,447	2,179
Minimum pension benefit retirement liability	—	313	414	246
Comprehensive income	$ 65,013	$ 17,834	$ 142,350	$ 88,042
Comprehensive income attributable to noncontrolling interest	9	6	16	70
Comprehensive income attributable to Advanced Energy Industries, Inc.	$ 65,004	$ 17,828	$ 142,334	$ 87,972

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

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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 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
Stock issued from equity plans	67	—	956	—	—	—	956
Stock-based compensation	—	—	3,277	—	—	—	3,277
Share repurchase	(72)	—	(199)	—	(6,304)	—	(6,503)
Dividends declared ($0.10 per share)	—	—	—	—	(3,874)		(3,874)
Other comprehensive income	—	—	—	1,035	—	—	1,035
Net income	—	—	—	—	35,409	31	35,440
Balances, June 30, 2021	38,381	38	110,099	(6,538)	772,342	665	876,606
Stock issued from equity plans	14	—	223	—	—	—	223
Stock-based compensation	—	—	3,540	—	—	—	3,540
Share repurchase	(605)	—	(1,635)	—	(50,920)	—	(52,555)
Dividends declared ($0.10 per share)	—	—	—	—	(3,857)	—	(3,857)
Other comprehensive loss	—	—	—	(3,176)	—	—	(3,176)
Net income	—	—	—	—	21,004	6	21,010
Balances, September 30, 2021	37,790	$ 38	$ 112,227	$ (9,714)	$ 738,569	$ 671	$ 841,791
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
Stock issued from equity plans	63	—	763	—	—	—	763
Stock-based compensation	—	—	5,016	—	—	—	5,016
Share repurchase	(230)	(1)	(725)	—	(16,293)	—	(17,019)
Dividends declared ($0.10 per share)	—	—	—	—	(3,806)	—	(3,806)
Other comprehensive loss	—	—	—	(6,384)	—	—	(6,384)
Net income	—	—	—	—	44,970	21	44,991
Balances, June 30, 2022	37,392	37	121,982	(5,634)	807,843	652	924,880
Stock issued from equity plans	35	—	256	—	—	—	256
Stock-based compensation	—	—	5,953	—	—	—	5,953
Share repurchase	(34)	—	(112)	—	(2,230)	—	(2,342)
Dividends declared ($0.10 per share)	—	—	—	—	(3,812)	—	(3,812)
Other comprehensive loss	—	—	—	(9,163)	—	—	(9,163)
Net income	—	—	—	—	74,167	9	74,176
Balances, September 30, 2022	37,393	$ 37	$ 128,079	$ (14,797)	$ 875,968	$ 661	$ 989,948

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)

	Nine Months Ended September 30, 2022	2021
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net income	$ 155,931	$ 95,151
Less: income (loss) from discontinued operations, net of income taxes	(615)	171
Income from continuing operations, net of income taxes	156,546	94,980
Adjustments to reconcile net income to net cash from operating activities:		
Depreciation and amortization	44,433	39,225
Stock-based compensation expense	15,008	12,819
Provision for deferred income taxes	(2,496)	(1,404)
Gain from discount on notes receivable	—	(638)
(Gain) loss on disposal and sale of assets	(4,058)	923
Changes in operating assets and liabilities, net of assets acquired		
Accounts and other receivable, net	(68,591)	14,957
Inventories	(70,407)	(118,562)
Other assets	(11,858)	1,958
Accounts payable	21,630	63,404
Other liabilities and accrued expenses	7,281	8,963
Income taxes payable	25,494	(10,215)
Net cash from operating activities from continuing operations	112,982	106,410
Net cash from operating activities from discontinued operations	(81)	(523)
Net cash from operating activities	112,901	105,887
CASH FLOWS FROM INVESTING ACTIVITIES:		
Receipt of notes receivable	—	802
Purchases of property and equipment	(39,507)	(21,184)
Acquisitions, net of cash acquired	(145,779)	(18,739)
Net cash from investing activities	(185,286)	(39,121)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from long-term borrowings	—	85,000
Payment of debt-issuance costs	—	(1,350)
Payments on long-term borrowings	(15,000)	(8,750)
Dividend payments	(11,407)	(11,585)
Purchase and retirement of common stock	(25,955)	(56,625)
Net payments related to stock-based awards	(1,411)	(3,136)
Net cash from financing activities	(53,773)	3,554
EFFECT OF CURRENCY TRANSLATION ON CASH AND CASH EQUIVALENTS	(9,161)	(2,765)
NET CHANGE IN CASH AND CASH EQUIVALENTS	(135,319)	67,555
CASH AND CASH EQUIVALENTS, beginning of period	544,372	480,368
CASH AND CASH EQUIVALENTS, end of period	$ 409,053	$ 547,923
SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION:		
Cash paid for interest	$ 2,965	$ 2,896
Cash paid for income taxes	$ 5,393	$ 25,271

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 consolidated 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 plasma power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition. Our broad portfolios of high and low voltage power products are used in a wide range of applications, such as semiconductor equipment, industrial production, medical and life science equipment, data center and telecommunication. 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.

In management's opinion, the accompanying unaudited consolidated financial statements contain all adjustments, consisting of normal, recurring adjustments, necessary to present fairly Advanced Energy's financial position as of September 30, 2022, and the results of our operations and cash flows for the three and nine months ended September 30, 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.

We reclassified certain prior period amounts within these consolidated financial statements to conform to the current year presentation.

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 business combinations subsequent to that date 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.

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.

(In thousands, except per share data)

NOTE 2. ACQUISITIONS

SL Power Electronics Corporation

On April 25, 2022, we acquired 100% of the issued and outstanding shares of capital stock of SL Power Electronics Corporation ("SL Power"), which is based in Calabasas, California. We accounted for this transaction as a business combination. This acquisition added complementary products to Advanced Energy's medical power offerings and extends our presence in several advanced industrial markets.

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

Cash paid for acquisition	$	146,863
Less cash acquired		(3,484)
Total fair value of purchase consideration	$	143,379

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

	Preliminary Fair Value September 30, 2022	
Current assets and liabilities, net	$	12,013
Property and equipment		3,927
Operating lease right-of-use assets		4,996
Deferred taxes and other liabilities		(1,164)
Intangible assets		57,600
Goodwill		71,003
Operating lease liability		(4,996)
Total fair value of net assets acquired	$	143,379

The following table summarizes the intangible assets acquired:

	Fair Value		Amortization Method	Useful Life (in years)
Customer relationships	$	50,500	Straight-line	10
Technology		7,100	Straight-line	5
Total	$	57,600		

To estimate the fair value of intangible assets, we used a multi-period excess earnings approach for the customer relationships and a relief from royalty approach for developed technology. Goodwill represents SL Power's assembled workforce and expected operating synergies from combining operations and approximately 85% is expected to be deductible for tax purposes. We are still evaluating the fair value for the assets acquired and liabilities assumed. Accordingly, the purchase price allocation presented above is preliminary.

We included SL Power's results of operations in our consolidated financial statements from the date of acquisition. The following table summarizes SL Power's contribution to sales in our Consolidated Statements of Operations.

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022		2022	
Sales, net	$	16,659	$	29,604

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

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. We accounted for this transaction as a business combination. 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 at closing	$	15,430
Cash paid for indemnity holdback released in June 2022		1,800
Less cash acquired		(177)
Total fair value of purchase consideration	$	17,053

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

		Fair Value
Current assets and liabilities, net	$	3,475
Property and equipment		755
Operating lease right-of-use assets		425
Intangible assets		6,900
Goodwill (deductible for tax purposes)		5,917
Other		6
Operating lease liability		(425)
Total fair value of net assets acquired	$	17,053

Goodwill represents TEGAM's assembled workforce and expected operating synergies from combining operations. We included TEGAM's results of operations in our consolidated financial statements from the date of acquisition.

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, medical equipment, life science applications, industrial technology and production, scientific instruments, clean technology production, advanced material production, temperature-critical material processing, data center computing, networking, and

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

telecommunication. 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.

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.

Remaining Performance obligations

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

Disaggregation of revenue

The following tables present additional information regarding our revenue:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Semiconductor Equipment	$ 266,600	$ 173,441	$ 698,354	$ 530,828
Industrial and Medical	119,587	80,800	307,436	242,412
Data Center Computing	87,542	62,231	232,941	190,843
Telecom and Networking	42,545	29,621	115,951	94,941
Total	$ 516,274	$ 346,093	$ 1,354,682	$ 1,059,024

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Product	$ 471,627	$ 312,389	$ 1,238,480	$ 956,790
Services	44,647	33,704	116,202	102,234
Total	$ 516,274	$ 346,093	$ 1,354,682	$ 1,059,024

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

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
United States	$ 197,205	$ 139,089	$ 530,240	$ 410,212
North America (excluding U.S.)	40,910	24,708	96,713	77,067
Asia	215,401	135,838	557,629	434,232
Europe	61,456	44,838	157,972	129,751
Other	1,302	1,620	12,128	7,762
Total	$ 516,274	$ 346,093	$ 1,354,682	$ 1,059,024

During the three months ended September 30, 2022, Applied Materials, Inc. and Lam Research Corporation accounted for 19% and 15%, respectively, of our total revenue compared to 22% and 11%, respectively, of our total revenue during the same period in the prior year. During the nine months ended September 30, 2022, Applied Materials, Inc. and Lam Research Corporation accounted for 20% and 14%, respectively, of our total revenue compared to 21% 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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Income from continuing operations, before income taxes	$ 86,512	$ 24,704	$ 186,341	$ 105,797
Provision for income taxes	$ 11,639	$ 3,657	$ 29,795	$ 10,817
Effective tax rate	13.5 %	14.8 %	16.0 %	10.2 %

Our effective tax rates differ from the U.S. federal statutory rate of 21% for the three and nine months ended September 30, 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 three months ended September 30, 2022 was lower than the same period in 2021 primarily due to the cumulative year to date impact of increased earnings in 2022 and the resulting mix of earnings by geography. The effective tax rate for the nine months ended September 30, 2022 was higher than the same period in 2021 primarily due to beneficial discrete items occurring in 2021 not recurring in 2022, and by the capitalization and amortization of research and development expenses rather than immediately expensing them starting in 2022 as required by the 2017 Tax Cuts and Jobs Act.

Under the 2017 Tax Cuts and Jobs Act enacted in December 2017, research and development expenses incurred for tax years beginning after December 31, 2021 must be capitalized and amortized ratably over five or fifteen years for tax purposes. Although Congress is considering legislation that would defer the capitalization and amortization requirement, there is no assurance that the provision will be repealed or otherwise modified. If the requirement is not modified, it may materially increase future cash taxes beginning in 2023.

The Inflation Reduction Act ("IRA") and CHIPS and Science Act ("CHIPS Act") were both enacted in August 2022. The IRA introduced new provisions including a 15% corporate alternative minimum tax for certain large corporations that have at least an average of $1 billion adjusted financial statement income over a consecutive three-tax-year period and a 1% excise tax surcharge on stock repurchases. The CHIPS Act provides a variety of incentives associated with investments in domestic semiconductor manufacturing and related activities. Both Acts are applicable for tax years beginning after December 31, 2022 and had no impact to our consolidated financial statements in the nine months ended September 30, 2022.

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

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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Income from continuing operations	$ 74,873	$ 21,047	$ 156,546	$ 94,980
Less: income from continuing operations attributable to noncontrolling interest	9	6	16	70
Income from continuing operations attributable to Advanced Energy Industries, Inc.	$ 74,864	$ 21,041	$ 156,530	$ 94,910
Basic weighted-average common shares outstanding	37,379	38,183	37,482	38,296
Assumed exercise of dilutive stock options and restricted stock units	251	180	243	221
Diluted weighted-average common shares outstanding	37,630	38,363	37,725	38,517
Continuing operations:				
Basic earnings per share	$ 2.00	$ 0.55	$ 4.18	$ 2.48
Diluted earnings per share	$ 1.99	$ 0.55	$ 4.15	$ 2.46

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 September 30,		Nine Months Ended September 30,	
(in thousands, except per share amounts)	2022	2021	2022	2021
Amount paid or accrued to repurchase shares	$ 2,342	$ 52,555	$ 25,955	$ 59,058
Number of shares repurchased	34	605	346	677
Average repurchase price per share	$ 69.39	$ 86.93	$ 75.07	$ 87.30

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

In July 2022, the Board of Directors approved an increase to the share repurchase plan that increased the remaining amount authorized for future repurchases to a maximum of $200.0 million with no time limitation. At September 30, 2022, the remaining amount authorized by the Board of Directors for future share repurchases was $200.0 million.

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.

Description	Balance Sheet Classification	September 30, 2022 Level 1	Level 2	Level 3	Total Fair Value
Assets:					
Certificates of deposit	Other current assets	$ —	$ 2,120	$ —	$ 2,120
Foreign currency forward contracts	Other current assets	—	208	—	208
Interest rate swaps	Deposits and other assets	—	16,113	—	16,113
Total assets measured at fair value on a recurring basis		$ —	$ 18,441	$ —	$ 18,441
Liabilities:					
Contingent consideration	Other current liabilities	$ —	$ —	$ 1,779	$ 1,779
Total liabilities measured at fair value on a recurring basis		$ —	$ —	$ 1,779	$ 1,779

Description	Balance Sheet Classification	December 31, 2021 Level 1	Level 2	Level 3	Total Fair Value
Assets:					
Certificates of deposit	Other current assets	$ —	$ 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 partially offset the economic fluctuations of certain of our assets and liabilities due to foreign exchange rate changes.

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

	September 30, 2022	December 31, 2021
Foreign currency forward contracts	$ 83,760	$ —

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:

	September 30, 2022	December 31, 2021
Interest rate swap contracts	$ 242,594	$ 255,719

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

	September 30, 2022	December 31, 2021
Interest rate swap contract gains	$ 12,427	$ 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 RECEIVABLES, NET

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

	September 30, 2022	December 31, 2021
Amounts billed, net	$ 289,007	$ 217,549
Unbilled receivables	18,011	19,678
Total receivables, net	$ 307,018	$ 237,227

"Amounts billed, net" represents amounts invoiced to customers in accordance with our terms and conditions and includes 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	441
Deductions - write-offs, net of recoveries	(4,170)
Foreign currency translation	(30)
September 30, 2022	$ 2,025

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:

	September 30, 2022	December 31, 2021
Parts and raw materials	$ 311,748	$ 261,365
Work in process	28,860	24,222
Finished goods	68,814	52,823
Total	$ 409,422	$ 338,410

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
(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)	September 30, 2022	December 31, 2021
Buildings, machinery, and equipment	5 to 25	$ 149,877	$ 134,635
Computer equipment, furniture, fixtures, and vehicles	3 to 5	34,557	33,490
Leasehold improvements	2 to 10	61,804	48,370
Construction in process		16,787	5,914
		263,025	222,409
Less: Accumulated depreciation		(126,523)	(107,579)
Property and equipment, net		$ 136,502	$ 114,830

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

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Depreciation expense	$ 8,507	$ 7,874	$ 25,352	$ 22,721

NOTE 11. GOODWILL

The following table summarizes the changes in goodwill:

December 31, 2021	$ 212,190
Measurement period adjustments	40
Additions from acquisition	71,003
Foreign currency translation	(4,007)
September 30, 2022	$ 279,226

(In thousands, except per share data)

NOTE 12. INTANGIBLE ASSETS

Intangible assets consisted of the following:

	September 30, 2022		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Technology	$ 96,027	$ (43,146)	$ 52,881
Customer relationships	166,018	(40,325)	125,693
Trademarks and other	26,864	(9,631)	17,233
Total	$ 288,909	$ (93,102)	$ 195,807

	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 September 30, 2022, the weighted average remaining useful life of intangibles subject to amortization was approximately 9.3 years.

Amortization expense related to intangible assets is as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Amortization expense	$ 7,049	$ 5,607	$ 19,081	$ 16,504

Estimated amortization expense related to intangibles is as follows:

Year Ending December 31,	
2022 (remaining)	$ 7,014
2023	28,058
2024	25,072
2025	20,905
2026	19,189
Thereafter	95,569
Total	$ 195,807

ADVANCED ENERGY INDUSTRIES, INC.
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
(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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Severance and related charges	$ 121	$ 676	$ 833	$ 1,270
Facility relocation and closure charges	—	596	345	1,251
Total restructuring charges	$ 121	$ 1,272	$ 1,178	$ 2,521

	Cumulative Cost Through September 30, 2022
Severance and related charges	$ 21,213
Facility relocation and closure charges	7,160
Total restructuring charges	$ 28,373

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

December 31, 2021	$ 9,263
Costs incurred and charged to expense	1,178
Costs paid or otherwise settled	(8,623)
Effects of changes in exchange rate	(24)
September 30, 2022	$ 1,794

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:

December 31, 2021	$ 3,350
Additions from acquisitions	181
Increases to accruals	4,820
Warranty expenditures	(2,431)
Effect of changes in exchange rates	(98)
September 30, 2022	$ 5,822

(In thousands, except per share data)

NOTE 15. LEASES

Components of operating lease cost were as follows:

	Three Months Ended September 30, 2022	Three Months Ended September 30, 2021	Nine Months Ended September 30, 2022	Nine Months Ended September 30, 2021
Operating lease cost	$ 5,613	$ 5,735	$ 17,061	$ 17,708
Short-term and variable lease cost	1,177	578	3,516	1,704
Total operating lease cost	$ 6,790	$ 6,313	$ 20,577	$ 19,412

Maturities of our operating lease liabilities are as follows:

Year Ending December 31,	
2022 (remaining)	$ 5,421
2023	20,029
2024	17,518
2025	14,515
2026	13,190
Thereafter	68,353
Total lease payments	139,026
Less: Interest	(28,152)
Present value of lease liabilities	$ 110,874

	September 30, 2022	December 31, 2021
Weighted average remaining lease term (in years)	9.1	9.8
Weighted average discount rate	4.6 %	4.5 %

	Three Months Ended September 30, 2022	Three Months Ended September 30, 2021	Nine Months Ended September 30, 2022	Nine Months Ended September 30, 2021
Cash paid for operating leases	$ 5,557	$ 6,058	$ 16,642	$ 18,037
Right-of-use assets obtained in exchange for operating lease liabilities	$ 2,222	$ 7,169	$ 14,433	$ 14,402

NOTE 16. STOCK-BASED COMPENSATION

As of September 30, 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:

	September 30, 2022
Shares available for future issuance under the 2017 Omnibus Incentive Plan	1,536
Shares available for future issuance under the Employee Stock Purchase Plan	642

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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Stock-based compensation expense	$ 6,022	$ 3,674	$ 15,008	$ 12,819

Changes in our RSUs were as follows:

	Nine Months Ended September 30, 2022	
	Number of RSUs	Weighted-Average Grant Date Fair Value
RSUs outstanding at beginning of period	627	$ 76.37
RSUs granted	525	$ 73.38
RSUs vested	(145)	$ 84.99
RSUs forfeited	(248)	$ 60.74
RSUs outstanding at end of period	759	$ 77.77

Changes in our stock options were as follows:

	Nine Months Ended September 30, 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 exercised	(25)	$ 23.30
Options outstanding at end of period	163	$ 53.10

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

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.

	September 30, 2022		
	Balance	Interest Rate	Unused Line Fee
Term Loan Facility subject to a fixed interest rate	$ 242,594	1.271%	—
Term Loan Facility subject to a variable interest rate	137,406	3.865%	—
Revolving Facility subject to a variable interest rate	—	3.865%	0.10%
Total borrowings under the Credit Agreement	$ 380,000		

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.

	September 30, 2022	December 31, 2021
Available capacity on Revolving Facility	$ 200,000	$ 200,000

In addition to the available capacity on the Revolving Facility, prior to the maturity date of our Credit Agreement, we may also request an increase to the financing commitments in either the Term Loan Facility or Revolving Facility by an aggregate amount not to exceed $250.0 million at identical terms to our existing Credit Facility.

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

The fair value of the Term Loan Facility approximates the outstanding balance of $380.0 million as of September 30, 2022.

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

	September 30, 2022	December 31, 2021
Term Loan Facility	$ 380,000	$ 395,000
Less: debt discount	(1,868)	(2,267)
Total debt	378,132	392,733
Less current portion of long-term debt	(20,000)	(20,000)
Total long-term debt	$ 358,132	$ 372,733

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

Year Ending December 31,	
2022 (remaining)	$ 5,000
2023	20,000
2024	20,000
2025	20,000
2026	315,000
Total	$ 380,000

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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Interest expense	$ 1,842	$ 1,009	$ 4,303	$ 2,973
Amortization of debt issuance costs	136	420	413	669
Unused line of credit fees and other	51	41	152	116
Total interest expense	$ 2,029	$ 1,470	$ 4,868	$ 3,758

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:

- macroeconomic risks, including supply chain cost increases and other inflationary pressures, recession, changes in financial markets, economic volatility and cyclicality, higher interest rates, labor shortages, foreign currency fluctuations, and pricing controls;
- political and geographical risks, including trade and export controls, war, terrorism, international disputes and geopolitical tensions, natural disasters, public health issues, and industrial accidents;
- sufficiency and availability of components and materials;
- our level of and ability to manage backlog orders;
- our ability to develop new products expeditiously and be successful in the design win process with our customers;
- the ability to stay on the leading edge of innovation and obtain and defend necessary intellectual property protections;
- our future sales;
- our future profitability;
- our competition;
- market acceptance of, and demand for, our products;
- the fair value of our assets and financial instruments;
- research and development expenses;
- selling, general, and administrative expenses;
- sufficiency and availability of capital resources;
- ability to obtain equity or debt financing on favorable terms;
- capital expenditures;
- our production and operations 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;
- adequacy of reserves for bad debt, sales returns, and other reserves or impairments;
- our estimates of the fair value of assets acquired;
- restructuring activities and expenses;
- unanticipated costs in fulfilling our warranty obligations for solar inverters;
- the integration of our acquisitions;
- industry trends;
- our acquisition, divestiture, and joint venture activities; and
- cost fluctuations and pressures, including prices of components, commodities and raw materials, and costs of labor, transportation, energy, pension, and healthcare.

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 plasma power solutions enable innovation in complex semiconductor and thin film plasma processes such as dry etch, strip and deposition. Our broad portfolios of high and low voltage power products are used in a wide range of applications, such as semiconductor equipment, industrial production, medical and life science equipment, data center and telecommunication. 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.

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

In April 2022, we acquired SL Power Electronics Corporation ("SL Power"). See *Note 2. Acquisitions* in Part I, Item 1 "Unaudited Consolidated Financial Statements." This acquisition added complementary products to Advanced Energy's medical power offerings and extends our presence in several advanced industrial markets.

At the beginning of 2020 we saw the spread of COVID-19, which grew into a global pandemic. Our focus on providing a healthy and safe working environment for our employees led to intermittent shutdowns of our manufacturing facilities to implement new health and safety protocols and additional investments to comply with government guidelines. 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 2022, restrictions related to COVID-19, particularly in China, 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, have impacted our ability to fulfill product shipments to meet customer demand and contributed to increased backlog.

Although COVID-19 has impacted our revenues and manufacturing efficiency for almost three 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.

The shortage of critical components was caused by a variety of factors including increased demand for electronic components used in a wide variety of industries, the pandemic-driven rise in consumer demand for technology goods, logistics-related disruptions in shipping, and capacity limitations at some suppliers due to COVID-19 and its variants, labor shortages, and other factors. 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 these actions have enabled us to better meet customer demand. However, it is not clear how long supply constraint conditions will continue, how quickly it may recover, the extent to which our mitigating actions will be successful, or to what extent we can recover our higher costs.

Looking forward, we expect that for the remainder of 2022 customer demand will remain strong across many of 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. In addition, recent increases in global inflation, interest rates, financial market volatility, geopolitical tensions, additional export controls, and other factors impacting macroeconomic growth may impact future demand and our cost base. Most recently, in October of 2022, additional restrictions were announced by the US Commerce Department related to the export of semiconductor equipment for advanced computing chips that may have a negative impact on our semiconductor demand, backlog, and revenues. As such, our forward-looking projections of revenues, earnings, and cash flow may be adversely impacted if any of these situations continue or further deteriorates.

Semiconductor Equipment Market

Growth in the Semiconductor Equipment market is driven by growing integrated circuits content across many industries such as processing and storage in advanced applications including artificial intelligence, edge and cloud computing, autonomous and electric 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, 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 radio frequency ("RF") and direct current ("DC") plasma generation 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 and assembly, 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 including with new design and product generations, grow our market position in applications where we have lower share, such as remote plasma source and dielectric etch, and leverage our product portfolio in areas such as embedded power, high voltage power systems, and critical sensing and controls to grow our share and contents at our key original equipment manufacturer ("OEM") customers.

The Semiconductor Equipment market continues to experience demand growth 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 nine months of 2022, even with the negative impact of the global supply constraints. While demand continued to be strong through the third quarter of 2022, overcapacity in the memory market, changing macroeconomic conditions, and new export restrictions to China for certain semiconductor equipment may negatively impact our demand, backlog, and revenue levels. Long-term drivers for demand growth in this market include investment 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 increased complexity of advanced process requiring more complex and innovative power solutions. Overall, we expect to continue to invest in both increasing our capacity and capability to meet the expected long-term 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, industrial production, and large-scale connected light-emitting diode applications.

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. Our customers in this market are primarily global and regional original equipment and device manufacturers. These OEM customers incorporate our products and solutions into their equipment. Examples of products sold into the Industrial and Medical market include high voltage and low voltage power supplies used in applications such as medical devices, analytical instruments, test and measurement, medical lasers, scientific instrumentation and industrial equipment, power control modules and thermal instrumentation products for material fabrication, production process controls, and many precision industrial sensing applications.

Growth in the Industrial and Medical market is driven by growth investments in complex manufacturing processes or automation, increased adoption of smart power, sensing, and control 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, indoor farming, and many other applications.

During 2021 and the first nine months of 2022, we saw increased demand in the Industrial and Medical market as our customers increased investments in their production capacity and the medical technology industry recovered from the pandemic-related slowdown. In the first nine 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 fulfill product shipments at the level of customer demand. We expect product delivery and revenue levels will continue to be primarily dependent on resolving supply constraints. It is not clear how long these supply constraints 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 shifted from traditional enterprise on-premises computing to the data center, driving investments in data center infrastructure. In addition, the data center industry started to transition to 48 Volt infrastructure, where 48 Volt DC power replaces 12 Volt in server racks 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 complements 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 selected additional customers and profitable applications based on our differentiated capability and competitive strengths in power density, efficiency, and controls.

Customer demand for our products rose 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 nine months of 2022 increased compared to the same period in the prior year as demand grew and we were able to secure additional critical components. However, the supply of the critical components remains highly constrained, impacting our ability to fulfill product shipments at the level of customer demand. It is not clear how long these supply constraints will persist or how quickly our supply may recover.

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 are investing in 5G infrastructure, 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 and value-added applications for the Telecom and Networking market. Revenue increased in the first nine months of 2022 compared to the same period in the prior year due to increased customer demand and our ability to secure additional critical components. For the remainder of 2022, we expect demand to remain strong in this market driven by investments in 5G infrastructure in the U.S. and Europe and new design wins but the supply constraint condition continues to negatively impact our ability to fulfill product shipments at the level of customer demand. It is not clear how long these supply shortages will persist or how quickly our supply may recover. In addition, deteriorating macroeconomic conditions including higher interest rates and potential recession may impact our demand levels in 2023.

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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Sales	$ 516,274	$ 346,093	$ 1,354,682	$ 1,059,024
Gross profit	191,218	120,039	497,692	392,575
Operating expenses	113,646	95,830	322,698	283,104
Operating income from continuing operations	77,572	24,209	174,994	109,471
Other income (expense), net	8,940	495	11,347	(3,674)
Income from continuing operations before income taxes	86,512	24,704	186,341	105,797
Provision for income taxes	11,639	3,657	29,795	10,817
Income from continuing operations	$ 74,873	$ 21,047	$ 156,546	$ 94,980

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Sales	100.0 %	100.0 %	100.0 %	100.0 %
Gross profit	37.0	34.7	36.7	37.1
Operating expenses	22.0	27.7	23.8	26.7
Operating income from continuing operations	15.0	7.0	12.9	10.3
Other income (expense), net	1.7	0.1	0.8	(0.3)
Income from continuing operations before income taxes	16.8	7.1	13.8	10.0
Provision for income taxes	2.3	1.1	2.2	1.0
Income from continuing operations	14.5 %	6.1 %	11.6 %	9.0 %

SALES, NET

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

	Three Months Ended September 30,		Change 2022 v. 2021	
	2022	2021	Dollar	Percent
Semiconductor Equipment	$ 266,600	$ 173,441	$ 93,159	53.7 %
Industrial and Medical	119,587	80,800	38,787	48.0
Data Center Computing	87,542	62,231	25,311	40.7
Telecom and Networking	42,545	29,621	12,924	43.6
Total	$ 516,274	$ 346,093	$ 170,181	49.2 %

	Nine Months Ended September 30,		Change 2022 v. 2021	
	2022	2021	Dollar	Percent
Semiconductor Equipment	$ 698,354	$ 530,828	$ 167,526	31.6 %
Industrial and Medical	307,436	242,412	65,024	26.8
Data Center Computing	232,941	190,843	42,098	22.1
Telecom and Networking	115,951	94,941	21,010	22.1
Total	$ 1,354,682	$ 1,059,024	$ 295,658	27.9 %

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Semiconductor Equipment	51.6 %	50.1 %	51.6 %	50.1 %
Industrial and Medical	23.2	23.3	22.7	22.9
Data Center Computing	17.0	18.0	17.2	18.0
Telecom and Networking	8.2	8.6	8.5	9.0
Total	100.0 %	100.0 %	100.0 %	100.0 %

OPERATING EXPENSES

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

	Three Months Ended September 30,			
	2022		2021	
Research and development	$ 49,760	9.6 %	$ 40,578	11.7 %
Selling, general, and administrative	56,716	11.0	48,373	14.0
Amortization of intangible assets	7,049	1.4	5,607	1.6
Restructuring charges	121	—	1,272	0.4
Total operating expenses	$ 113,646	22.0 %	$ 95,830	27.7 %

	Nine Months Ended September 30,			
	2022		2021	
Research and development	$ 141,383	10.4 %	$ 120,865	11.4 %
Selling, general, and administrative	161,056	11.9	143,214	13.5
Amortization of intangible assets	19,081	1.4	16,504	1.6
Restructuring charges	1,178	0.1	2,521	0.2
Total operating expenses	$ 322,698	23.8 %	$ 283,104	26.7 %

SALES AND BACKLOG

Total Sales

Sales increased $170.2 million, or 49.2%, to $516.3 million for the three months ended September 30, 2022 and $295.7 million, or 27.9%, to $1,354.7 million for the nine months ended September 30, 2022 as compared to the same periods in the prior year.

The increase in sales was primarily due to increased demand for our products across all our markets and measures we took to improve material availability and capacity, which allowed us to better meet the higher demand. During the three and nine months ended September 30, 2022, the acquisition of SL Power contributed $16.7 million and $29.6 million, respectively, to our total sales. For additional information, see *Note 2. Acquisitions* in Part I, Item 1 "Unaudited Consolidated Financial Statements."

Revenues in the first nine months of 2022 continued to be impacted relative to demand across our markets by supply constraints for certain integrated circuits and other components, which limited our ability to fulfill product shipments to meet our total demand. As a result, we saw an increase in backlog, as indicated in the table below.

Backlog

The following table summarizes our backlog (in thousands):

	September 30, 2022	December 31, 2021	September 30, 2021	Change from Year End		Change from Same Period One Year Ago	
				Dollar	Percent	Dollar	Percent
Backlog	$ 1,093,026	$ 927,810	$ 771,433	$ 165,216	17.8 %	$ 321,593	41.7 %

Backlog represents outstanding orders for products we expect to deliver within the next 12 months. Backlog increased from the end of last year and the same period one year ago due to the global supply constraint environment, resulting in customers placing larger orders than historical levels in anticipation of longer-term demand and our lead time extending. We believe these higher backlog levels provide some level of revenue protection if demand levels are reduced due to macroeconomic factors.

Backlog at any particular date is not necessarily indicative of actual sales which may be generated for any succeeding period. In addition, there is uncertainty of the timing of when backlog can convert into revenue due to supply constraints. Because our customers generally order on a purchase order basis, they can typically cancel, change, or delay product purchase commitments with little or no notice.

Sales by Market

Sales in the Semiconductor Equipment market increased $93.2 million, or 53.7%, to $266.6 million for the three months ended September 30, 2022 and $167.5 million, or 31.6%, to $698.4 million for the nine months ended September 30, 2022 as compared to the same periods in the prior year. The increase in sales during 2022 is primarily due to growth in the Semiconductor Equipment market, improving parts availability, increases in factory output, market share gains in selected areas, and expansion of our product portfolio.

Sales in the Industrial and Medical market increased $38.8 million, or 48.0%, to $119.6 million for the three months ended September 30, 2022 and $65.0 million, or 26.8%, to $307.4 million for the nine months ended September 30, 2022, as compared to the same periods in the prior year. The increase in sales relative to the same period in the prior year is primarily due to increased demand for our products, improving material availability, market share gains in selected areas, and the incremental sales from our acquisition of SL Power.

Sales in the Data Center Computing market increased $25.3 million, or 40.7%, to $87.5 million for the three months ended September 30, 2022 and increased $42.1 million, or 22.1%, to $232.9 million for the nine months ended September 30, 2022 as compared to the same periods in the prior year. The increase in Data Center Computing market sales during the nine months ended September 30, 2022 is due in part to the early 2021 digestion of equipment at key accounts and better supply availability, which enabled us to partially fulfill product shipments against higher customer demand.

Sales in the Telecom and Networking market increased $12.9 million, or 43.6%, to $42.5 million for the three months ended September 30, 2022 and $21.0 million, or 22.1%, to $116.0 million for the nine months ended September 30, 2022 as compared to the same periods in the prior year. The increase in sales was primarily due to increased demand in the Telecom and Networking market and improved material availability.

GROSS PROFIT

For the three months ended September 30, 2022, gross profit increased $71.2 million to $191.2 million, or 37.0% of revenue, as compared to $120.0 million, or 34.7% of revenue, in the same period in the prior year. For the nine months ended September 30, 2022, gross profit increased $105.1 million to $497.7 million, or 36.7% of revenue, as compared to $392.6 million, or 37.1% of revenue, in the same period in the prior year.

The increase in gross profit as a percent of revenue for the three months ended September 30, 2022 is largely due to operational leverage on sales growth. The decrease in gross profit as a percent of revenue for the nine months ended September 30, 2022 is largely related to higher material and freight costs, productivity inefficiencies, and other supply chain related costs. These factors began to affect Advanced Energy primarily in the second quarter of 2021.

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 $9.2 million to $49.8 million for the three months ended September 30, 2022 and increased $20.5 million to $141.4 million for the nine months ended September 30, 2022 as compared to the same periods in the prior year. The increase in research and development expense is related to the acquisitions of SL Power and TEGAM, increased headcount and associated costs, outside technical services, engineering materials and higher variable compensation related costs, as we invest 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 $8.3 million to $56.7 million for the three months ended September 30, 2022 and increased $17.8 million to $161.1 million for the nine months ended September 30, 2022 as compared to the same periods in the prior year. The increase in SG&A is principally related to acquisition related activities, sales commissions driven by higher revenue, an increase in headcount, and an increase in variable compensation.

Amortization of Intangibles

Amortization expense increased $1.4 million to $7.0 million during the three months ended September 30, 2022 and increased $2.6 million to $19.1 million for the nine months ended September 30, 2022, as compared to the same periods in the prior year. The increase is primarily driven by incremental amortization of newly acquired intangible assets. For additional information, see *Note 2. Acquisitions* and *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.

Other income (expense), net increased $8.4 million to $8.9 million for the three months ended September 30, 2022 and increased $15.0 million to $11.3 million for the nine months ended September 30, 2022 as compared to the same periods in the prior year. The increase in income between periods is primarily a result of higher unrealized foreign exchange gains due to the strengthening US dollar compared to our other foreign currencies and a one-time gain on the sale of intellectual property from a previous acquisition. This was partially offset by higher interest expense on increasing interest rates.

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 September 30,		Nine Months Ended September 30,	
	2022	**2021**	**2022**	**2021**
Income from continuing operations, before income taxes	$ 86,512	$ 24,704	$ 186,341	$ 105,797
Provision for income taxes	$ 11,639	$ 3,657	$ 29,795	$ 10,817
Effective tax rate	13.5 %	14.8 %	16.0 %	10.2 %

Our effective tax rates differ from the U.S. federal statutory rate of 21% for the three and nine months ended September 30, 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 three months ended September 30, 2022 was lower than the same period in 2021 primarily due to the cumulative year to date impact of increased earnings in 2022 and the resulting mix of earnings by geography. The effective tax rate for the nine months ended September 30, 2022 was higher than the same period in 2021 primarily due to beneficial discrete items occurring in 2021 not recurring in 2022, and by the capitalization and amortization of research and development expenses rather than immediately expensing them starting in 2022 as required by the 2017 Tax Cuts and Jobs Act.

Under the 2017 Tax Cuts and Jobs Act enacted in December 2017, research and development expenses incurred for tax years beginning after December 31, 2021 must be capitalized and amortized ratably over five or fifteen years for tax purposes. Although Congress is considering legislation that would defer the capitalization and amortization requirement, there is no assurance that the provision will be repealed or otherwise modified. If the requirement is not modified, it may materially increase future cash taxes beginning in 2023.

The Inflation Reduction Act (“IRA”) and CHIPS and Science Act (“CHIPS Act”) were both enacted in August 2022. The IRA introduced new provisions including a 15% corporate alternative minimum tax for certain large corporations that have at least an average of $1 billion adjusted financial statement income over a consecutive three-tax-year period and a 1% excise tax surcharge on stock repurchases. The CHIPS Act provides a variety of incentives associated with investments in domestic semiconductor manufacturing and related activities. Both Acts are applicable for tax years beginning after December 31, 2022 and had no impact to our consolidated financial statements in the nine months ended September 30, 2022.

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 and 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 September 30,**		**Nine Months Ended September 30,**	
	2022	**2021**	**2022**	**2021**
Gross profit from continuing operations, as reported	$ 191,218	$ 120,039	$ 497,692	$ 392,575
Adjustments to gross profit:				
Stock-based compensation	454	218	1,087	783
Facility expansion, relocation costs and other	1,662	1,357	4,133	5,192
Acquisition-related costs	66	3,259	(372)	3,351
Non-GAAP gross profit	193,400	124,873	502,540	401,901
Non-GAAP gross margin	37.5%	36.1%	37.1%	38.0%
Operating expenses from continuing operations, as reported	113,646	95,830	322,698	283,104
Adjustments:				
Amortization of intangible assets	(7,049)	(5,607)	(19,081)	(16,504)
Stock-based compensation	(5,568)	(3,456)	(13,921)	(12,036)
Acquisition-related costs	(1,150)	(1,768)	(6,977)	(6,124)
Facility expansion, relocation costs and other	—	(98)	—	(212)
Restructuring charges	(121)	(1,272)	(1,178)	(2,521)
Non-GAAP operating expenses	99,758	83,629	281,541	245,707
Non-GAAP operating income	$ 93,642	$ 41,244	$ 220,999	$ 156,194
Non-GAAP operating margin	18.1%	11.9%	16.3%	14.7%

Reconciliation of non-GAAP measure **Income from continuing operations, excluding certain items** **(in thousands, except per share amounts)**	**Three Months Ended September 30,**		**Nine Months Ended September 30,**	
	2022	**2021**	**2022**	**2021**
Income from continuing operations, less non-controlling interest, net of income taxes	$ 74,864	$ 21,041	$ 156,530	$ 94,910
Adjustments:				
Amortization of intangible assets	7,049	5,607	19,081	16,504
Acquisition-related costs	1,216	5,027	6,605	9,475
Facility expansion, relocation costs, and other	1,662	1,455	4,133	5,404
Restructuring charges	121	1,272	1,178	2,521
Unrealized foreign currency (gain) loss	(6,169)	(2,092)	(13,023)	(3,409)
Acquisition-related costs and other included in other income (expense), net	(4,685)	(79)	(4,600)	907
Tax effect of non-GAAP adjustments	855	(1,036)	(966)	(4,363)
Non-GAAP income, net of income taxes, excluding stock-based compensation	74,913	31,195	168,938	121,949
Stock-based compensation, net of taxes	4,697	2,811	11,668	9,809
Non-GAAP income, net of income taxes	$ 79,610	$ 34,006	$ 180,606	$ 131,758
Non-GAAP diluted earnings per share	$ 2.12	$ 0.89	$ 4.79	$ 3.42

Impact of Inflation

In previous years, inflation has not had a significant impact on our operations. However, more recently we are experiencing inflationary pressure from price increases in select components driven by factors such as higher global demand, supply chain disruptions, higher labor expenses, and increased freight costs. In this environment, we are actively working with our customers to adjust pricing that helps offset the inflationary pressure on the cost of our components.

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 in *Note 18. Credit Facility* in Part I, Item 1 "Unaudited Consolidated Financial Statements").

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

	September 30, 2022
Cash and cash equivalents	$ 409,053
Marketable securities	2,120
Total cash, cash equivalents, and marketable securities	$ 411,173

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.

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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).

	September 30, 2022		
	Balance	Interest Rate	Unused Line Fee
Term Loan Facility subject to a fixed interest rate	$ 242,594	1.271%	—
Term Loan Facility subject to a variable interest rate	137,406	3.865%	—
Revolving Facility subject to a variable interest rate	—	3.865%	0.10%
Total borrowings under the Credit Agreement	$ 380,000		

As of September 30, 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.

In addition to the available capacity on the Revolving Facility, prior to the maturity date of our Credit Agreement, we may also request an increase to the financing commitments in either the Term Loan Facility or Revolving Facility by an aggregate amount not to exceed $250.0 million at identical terms to our existing Credit Facility.

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 nine months ended September 30, 2022, we paid quarterly cash dividends of $0.10 per share totaling $11.4 million. We currently anticipate that a cash dividend of $0.10 per share will continue to be paid on a quarterly basis, although the declaration of any future cash dividend is at the discretion of the Board 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:

	Three Months Ended September 30,		Nine Months Ended September 30,	
(in thousands, except per share amounts)	2022	2021	2022	2021
Amount paid or accrued to repurchase shares	$ 2,342	$ 52,555	$ 25,955	$ 59,058
Number of shares repurchased	34	605	346	677
Average repurchase price per share	$ 69.39	$ 86.93	$ 75.07	$ 87.30

In July 2022, the Board of Directors approved an increase to the share repurchase plan that increased the remaining amount authorized for future repurchases to a maximum of $200.0 million with no time limitation. At September 30, 2022, the remaining amount authorized by the Board of Directors for future share repurchases was $200.0 million.

Cash Flows

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

	Nine Months Ended September 30, 2022	2021
Net cash from operating activities from continuing operations	$ 112,982	$ 106,410
Net cash from operating activities from discontinued operations	(81)	(523)
Net cash from operating activities	112,901	105,887
Net cash from investing activities from continuing operations	(185,286)	(39,121)
Net cash from financing activities from continuing operations	(53,773)	3,554
Effect of currency translation on cash and cash equivalents	(9,161)	(2,765)
Net change in cash and cash equivalents	(135,319)	67,555
Cash and cash equivalents, beginning of period	544,372	480,368
Cash and cash equivalents, end of period	$ 409,053	$ 547,923

Net Cash From Operating Activities

Net cash from operating activities from continuing operations for the nine months ended September 30, 2022, was $113.0 million, as compared to $106.4 million for the same period in the prior year. The increase of $6.6 million in net cash flows from operating activities as compared to the same period in the prior year is primarily due to an increase in net income. This was partially offset by an unfavorable increase in net operating assets driven primarily by an increase in accounts receivable due to our strong revenue growth.

Net Cash From Investing Activities

Net cash from investing activities for the nine months ended September 30, 2022 was ($185.3) million, driven by the following:

- ($145.8) million for business combinations; and
- ($39.5) million in purchases of property and equipment largely driven by investments in our manufacturing footprint and capacity.

Net cash from investing for the nine months ended September 30, 2021 was ($39.1) million, driven partially by the following:

- ($21.2) million in purchases of property and equipment largely driven by investments in our manufacturing footprint and capacity; and
- ($18.7) million for business combinations.

Net Cash From Financing Activities

Net cash from financing activities for the nine months ended September 30, 2022 was ($53.8) million and included the following:

- ($26.0) million related to repurchases of our common stock;
- ($15.0) million for repayment of long-term debt;
- ($11.4) million for dividend payments; and
- ($1.4) million in net payments related to stock-based award activities.

Net cash from financing activities for the nine months ended September 30, 2021 was $3.6 million and included the following:

- $83.7 million proceeds from long-term debt;
- ($56.6) million related to repurchases of our common stock;
- ($8.8) million for repayment of long-term debt;
- ($3.1) million in net payments related to stock-based award activities; and
- ($11.6) million for dividend payments.

Effect of Currency Translation on Cash

During the nine months ended September 30, 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 and credit facility. We also have exposure to 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.

	September 30, 2022		
	Balance	**Interest Rate**	**Unused Line Fee**
Term Loan Facility subject to a fixed interest rate	$ 242,594	1.271%	—
Term Loan Facility subject to a variable interest rate	137,406	3.865%	—
Revolving Facility subject to a variable interest rate	—	3.865%	0.10%
Total borrowings under the Credit Agreement	$ 380,000		

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 ("Exchange 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 Exchange Act is accumulated and communicated to management, including our Principal Executive Officer (Stephen D. Kelley, President and Chief Executive Officer) and Principal Financial Officer (Paul 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, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of September 30, 2022. The conclusions of the Chief Executive Officer and Chief Financial Officer from this evaluation were communicated to the Audit and Finance Committee. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. We intend to continue to review and document our disclosure controls and procedures, including our internal controls over financial reporting, and may from time to time make changes aimed at enhancing their effectiveness and to ensure that our systems evolve with our business.

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. Although it is not possible to predict the outcome of these matters, we believe that the results of these proceedings will not have a material adverse effect on our financial condition, results of operations, or liquidity.

ITEM 1A. RISK FACTORS

Information concerning our risk factors is contained in Part I, Item 1A, "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2021. 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	
April	—	$ —	—	$ 121,783
May	103	$ 76.23	103	$ 113,969
June	127	$ 72.42	127	$ 104,765
Second quarter	230	$ 74.12	230	
July	34	$ 69.39	34	$ 200,000
August	—	$ —	—	$ 200,000
September	—	$ —	—	$ 200,000
Third quarter	34	$ 69.39	34	
Total	346	$ 75.07	346	$ 200,000

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 Advanced Energy Industries, Inc. to repurchase up to $200.0 million with no time limitation
July 2022	Approved an increase to the repurchase program from its remaining authorization of $102.4 million, to repurchase up to $200.0 million with no time limitation

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None

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ITEM 4. MINE SAFETY DISCLOSURES

None

ITEM 5. OTHER INFORMATION

None

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
10.1	Amended and Restated Deferred Compensation Plan				Filed herewith
31.1	Certification of the Chief Executive Officer Pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				Filed herewith
31.2	Certification of the 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: November 1, 2022

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

Exhibit 10.1

AE DEFERRED COMPENSATION PLAN

Amended and Restated Effective as of July 27, 2022

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AE DEFERRED COMPENSATION PLAN

Advanced Energy Industries, Inc., a Delaware corporation (the "Company"), established the AE Deferred Compensation Plan (the "Plan"), originally effective December 1, 2021 (the "Effective Date"), and hereby amends and restates the Plan in its entirety effective as of July 27, 2022.

ARTICLE I
PURPOSE AND DEFINITIONS

1.1 Purpose . The Company adopts the Plan for the purpose of providing a select group of management or highly compensated employees of the Company the opportunity to defer the receipt of Compensation otherwise payable to such employees in accordance with the terms of the Plan. The Plan is intended to, and shall be interpreted to, comply in all respects with Code Section 409A and those provisions of ERISA applicable to an unfunded plan maintained primarily to provide deferred compensation for a select group of management or highly compensated employees.

1.2 Definitions. The following capitalized terms, when used in this Plan, have the meanings set forth below:

Annual Bonus: A Participant's Annual Bonus or other incentive compensation provided for under a performance-based bonus or incentive arrangement, excluding Commission. As of the Effective Date, the Short-Term Incentive (STI) Plan has been approved for inclusion in this Plan as an Annual Bonus. An Annual Bonus may be determined by the Committee to constitute "performance-based compensation" under Treas. Reg. §1.409A-1(e)) earned with respect to one calendar year, provided that the performance period for such bonus amount is at least twelve (12) months long.

Base Salary: A Participant's annual base salary, excluding incentive and discretionary bonuses, commissions, reimbursements and other non-regular remuneration, received from the Company, prior to reduction for any salary deferrals under benefit plans sponsored by the Company, including but not limited to, plans established under Code Section 125 or Code Section 401(k).

Beneficiary: The person, persons or entity designated as such pursuant to Section 8.1.

Board: The Board of Directors of the Company.

Code: The Internal Revenue Code of 1986, as amended, as interpreted by Treasury regulations and applicable authorities promulgated thereunder.

Commission: "Sales commission compensation" as defined in Treas. Reg. §1.409A-2(a)(12).

Committee:	The person or persons appointed by the Board to administer the Plan in accordance with Article IX, provided, that if the Board does not appoint a Committee, the Board shall act as the Committee.
Company 401(k) Plan:	Advanced Energy Industries, Inc. 401(k) Profit Sharing Plan, as may be amended from time to time.
Compensation:	All amounts eligible for deferral for a particular Plan Year under Section 3.1.
Deferral Account:	The bookkeeping account or accounts established under this Plan pursuant to ARTICLE IV and maintained by the Company in the names of the respective Participants, to which all amounts deferred under the Plan and earnings on such amounts shall be credited, and from which all amounts distributed under the Plan shall be debited.
Disability or Disabled:	Consistent with the requirements of Code Section 409A, that the Participant is (a) unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or can be expected to last for a continuous period of not less than 12 months, or (b) by reason of any medically determinable physical or mental impairment which can be expected to result in death or can be expected to last for a continuous period of not less than 12 months, receiving income replacement benefits for a period of not less than three months under an accident and health plan covering employees of the Company. For purposes of this Plan, a Participant shall be deemed Disabled if determined to be totally disabled by the Social Security Administration. A Participant shall also be deemed Disabled if determined to be disabled in accordance with the applicable disability insurance program of the Company, provided that the definition of "disability" applied under such disability insurance program complies with the requirements of this definition.
Disability Claim:	A claim related to any distribution or rights to which a Participant or other claimant may be entitled in connection with the Participant's Disability, as described in Section 9.2(b)(3).
Eligible Executive:	Each individual who, according to the books and records of the Company meets all of the following criteria, as determined by the Committee: (i) is a member of a select group of highly compensated or management employees, (ii) holds a L1 or above leadership position with the Company; (iii) maintains full-time employment status, and (iv) is designated as eligible by the Board or Committee.

Employer:	(a)	Except as otherwise provided in part (b) of this definition, the Company and/or any of its subsidiaries (now in existence or hereafter formed or acquired) that have been selected by the Committee to participate in the Plan and have adopted the Plan as a participating Employer.
	b)	For the purpose of determining whether a Participant has experienced a Separation from Service, the term "Employer" shall mean:

(i) the entity for which the Participant performs services and with respect to which the legally binding right to compensation deferred under this Plan arises; and

(ii) all other entities with which the entity described above would be aggregated and treated as a single employer under Code Section 414(b) (controlled group of corporations) and Code Section 414(c) (a group of trades or businesses, whether or not incorporated, under common control), as applicable. In order to identify the group of entities described in the preceding sentence, the Committee shall use an ownership threshold of at least 50% as a substitute for the 80% minimum ownership threshold that appears in, and otherwise must be used when applying, the applicable provisions of (A) Code Section 1563 for determining a controlled group of corporations under Code Section 414(b), and (B) Treas. Reg. §1.414(c)-2 for determining the trades or businesses that are under common control under Code Section 414(c).

ERISA:	The Employee Retirement Income Security Act of 1974, as amended, including Department of Labor and Treasury regulations and applicable authorities promulgated thereunder.
Fund or Funds:	One or more of the investments selected by the Committee pursuant to Section 5.2 of the Plan.
Fund Subaccounts:	Subaccounts of a Participant's Deferral Account, each of which corresponds to a Fund.
Interest Rate:	For each Fund, the rate of return derived from the net gain or loss on the assets of such Fund, as determined by the Committee.
Participant:	Any Eligible Executive who becomes a Participant in this Plan in accordance with ARTICLE II.
Participant Election:	The forms or procedures by which a Participant makes elections with respect to (a) voluntary deferrals of his/her Compensation, (b) the Funds,

which shall act as the basis for crediting of interest on Deferral Account balances, and (c) the form and timing of distributions from Deferral Accounts. Participant Elections may take the form of an electronic communication followed by appropriate confirmation according to specifications established by the Committee.

Payment Date: The date by which a total distribution of the distributable amount shall be made or the date by which installment payments of the distributable amount shall commence, which shall be the first day of the month following the month in which the event triggering the distribution occurs; or, in the case of a Scheduled In-Service Distribution, the first day of the month following the date indicated by the Participant for the elected Scheduled In-Service Distribution. Notwithstanding the foregoing:

(a) the Payment Date shall not be before the earliest date or after the latest date on which benefits may be distributed under Code Section 409A without violation of the provisions thereof, as reasonably determined by the Committee;

(b) the Payment Date for a Scheduled In-Service Distribution may not be earlier than the date specified by the Committee pursuant to Section 6.5(a); and

(c) to the extent required under Code Section 409A, any amount that otherwise would be payable to a Participant who is a "specified employee" of the Company, as determined by the Company in accordance with Code Section 409A, during the six-month period following such Participant's Separation from Service, shall be suspended until the lapse of such six-month period (or, if earlier, the date of death of the Participant). The amount that otherwise would be payable to such Participant during such period of suspension shall be paid in a single payment within 30 days following the end of such six-month period (or, if such day is not a business day, on the next succeeding business day) or within 30 days following the death of the Participant during such six-month period, provided that the death of the Participant during such six-month period shall not cause the acceleration of any amount that otherwise would be payable on any date during such six-month period following the date of the Participant's death.

Payment Delay Period: Has the meaning described in Section 6.2(b)

Plan Year The calendar year.

Performance Year: To the extent that the Annual Bonus constitutes "performance-based compensation" under Treas. Reg. §1.409A-1(e), the calendar year used to measure the amount of Annual Bonus or Special Bonus (if applicable) to which a Participant may become entitled under a performance-based bonus or incentive arrangement.

Separation from Service: A Separation from Services provided by a Participant to his or her Employer, whether voluntarily or involuntarily, other than by reason of death or Disability, as determined by the Committee in accordance with Treas. Reg. §1.409A-1(h). For a Participant who provides services to an Employer as an employee, a Separation from Service shall occur when such Participant has experienced a termination of employment with the Employer. A Participant shall be considered to have experienced a termination of employment when the facts and circumstances indicate that the Participant and his or her Employer reasonably anticipate that either (i) no further services will be performed for the Employer after a certain date, or (ii) that the level of bona fide services the Participant will perform for the Employer after such date (whether as an employee or as an independent contractor) will permanently decrease to no more than 20% of the average level of bona fide services performed by such Participant (whether as an employee or an independent contractor) over the immediately preceding 36-month period (or the full period of services to the Employer if the Participant has been providing services to the Employer less than 36 months).

If a Participant is on military leave, sick leave, or other bona fide leave of absence, the employment relationship between the Participant and the Employer shall be treated as continuing intact, provided that the period of such leave does not exceed six (6) months, or if longer, so long as the Participant retains a right to reemployment with the Employer under an applicable statute or by contract. If the period of a military leave, sick leave, or other bona fide leave of absence exceeds six (6) months and the Participant does not retain a right to reemployment under an applicable statute or by contract, the employment relationship shall be considered to be terminated for purposes of this Plan as of the first day immediately following the end of such 6-month period. In applying the provisions of this paragraph, a leave of absence shall be considered a bona fide leave of absence only if there is a reasonable expectation that the Participant will return to perform services for the Employer.

Scheduled In-Service Distribution: A scheduled in-service distribution date elected by the Participant for distribution of amounts from a specified Deferral Account, including earnings thereon, which distribution shall be made provided that the Participant has not experienced a Separation from Service, as provided under Section 6.5.

Share Award: The number of bookkeeping units of cash-settled or share-settled incentive awards expressed in the form of common stock of the Company, if any, that the Company awards to an Eligible Executive, including without limitation cash-settled or share-settled restricted stock units and performance stock units, and any dividend equivalent rights thereunder. Notwithstanding the foregoing, no award, unit or right shall constitute a Share Award for purposes of this Plan unless it has been granted pursuant to the Advanced Energy Industries, Inc. 2017 Omnibus Incentive Plan (approved on May 4, 2017 and as amended from time to time), or any successor plan thereto that has been duly approved by the Company's stockholders.

Special Bonus: A Participant's bonus or other incentive compensation provided for as a one-time cash bonus or award, including, without limitation, a retention bonus or management-by-objectives bonus, specifically approved for inclusion in this Plan by the Committee, but not including an Annual Bonus, Commission, signing bonus, recognition spot bonus, or Share Award.

Unforeseeable Emergency: A severe financial hardship to the Participant resulting from an illness or accident of the Participant, the Participant's spouse, or a dependent (as defined in Code Section 152, without regard to Code Sections 152(b)(1), (b)(2), and (d)(1)(B)) of the Participant, loss of the Participant's property due to casualty, or other similar extraordinary and unforeseeable circumstances arising as a result of events beyond the control of the Participant, but shall in all events correspond to the meaning of the term "unforeseeable emergency" under Treas. Reg. §1.409A-3(i)(3). No Unforeseeable Emergency shall be deemed to exist to the extent that the financial hardship is or may be relieved (a) through reimbursement or compensation by insurance or otherwise, (b) by borrowing from commercial sources on reasonable commercial terms to the extent that this borrowing would not itself cause a severe financial hardship, (c) by cessation of deferrals under the Plan, or (d) by liquidation of the Participant's other assets to the extent that this liquidation would not itself cause severe financial hardship. The Committee shall determine whether the circumstances of the Participant constitute an Unforeseeable Emergency.

ARTICLE II
PARTICIPATION

2.1 Enrollment Requirements. As a condition to participation, each Eligible Executive shall complete, execute and return to the Committee the appropriate Participant Elections, as well as such other documentation and information as the Committee reasonably requests, by the deadline(s) established by the Committee. In addition, the Committee shall establish from time to time such other enrollment requirements as it determines, in its sole discretion, are necessary. If an Eligible Executive fails to meet all requirements established by the Committee within the period required, that Eligible Executive shall not be eligible to participate in the Plan during such Plan Year.

2.2 Commencement of Participation. Each Eligible Executive shall commence participation in the Plan on the date that the Committee determines that the Eligible Executive has met all enrollment requirements set forth in this Plan and required by the Committee, including returning all required documents to the Committee within the specified time period.

ARTICLE III
DEFERRAL ELECTIONS

3.1 Elections to Defer Compensation. An Eligible Executive shall be entitled to defer Compensation, including Base Salary, Commission, Annual Bonus, Special Bonus, and/or Share Awards (if so permitted by the Committee), in accordance with and subject to the conditions of this Article III, by filing with the Committee Participant Election(s) in such form and manner and at such time permitted under this Article III as the Committee shall prescribe. The Participant Election(s) and accompanying explanatory materials prescribed by the Committee for describing the time within which such elections may be made shall be treated as part of the Plan.

3.2 Deferral Amount. Elections to defer Compensation shall take the form of a whole percentage (less applicable payroll withholding requirements for Social Security and income taxes and employee benefit plans, as determined in the sole and absolute discretion of the Committee) of up to a maximum of 80% of Base Salary, 100% of any Commission, 100% of any Annual Bonus, and 100% of any Special Bonus (if applicable). Share Awards may be deferred as determined by the Committee in its sole discretion.

3.3 Time and Duration of Election. The time for making any deferral election shall be as follows:

(a) Election to Defer Base Salary, Commission and Special Bonus. A Participant who is an Eligible Executive as of the first day of any Plan Year beginning on or after the Effective Date may elect to defer his or her Base Salary and/or Special Bonus (if applicable) for such Plan Year, by election no later than December 1 of the immediately preceding Plan Year (or such later date as the Committee may authorize in its discretion, but not later than December 31 of such immediately preceding Plan Year), based on procedures established by the Committee. A Participant who is an Eligible Executive as of the first day of any Plan Year beginning on or after the Effective Date may elect to defer his or her Commission attributable to services provided in such Plan Year (as determined under Treas. Reg. §1.409A-2(a)(12)(i)) by election no later than December 1 of the immediately preceding Plan Year (or such later date as the Committee may authorize in its discretion, but not later than December 31 of such immediately preceding Plan Year), based on procedures established by the Committee.

(b) Election to Defer Annual Bonus. A Participant who is an Eligible Executive as of the first day of any Plan Year beginning on or after the Effective Date may elect to defer his or her Annual Bonus for such Plan Year, by election no later than December 1 of the immediately preceding Plan Year (or such later date as the Committee may authorize in its discretion, but not later than December 31 of such immediately preceding Plan Year), based on procedures established by the Committee. Notwithstanding the foregoing, to the extent that the Annual Bonus constitutes "performance-based compensation" under Treas. Reg. §1.409A-1(e), the Committee may (but shall not be obligated to) establish a different deferral election deadline, which in no event shall be later than the earlier of: (1) such time that the amount of the Annual Bonus is "readily ascertainable" pursuant to Treas. Reg. §1.409A-2(a)(8), or (2) June 30 of the Performance Year for such Annual Bonus; provided that the Participant has been performing services continuously from the later of the beginning of such Performance Year or the date the performance criteria for such Annual Bonus are established through the date the deferral election is made.

(c) New Participant Deferral Elections. An Eligible Executive who first becomes eligible to participate in the Plan as of the Effective Date or after the beginning of any Plan Year, as determined in accordance with Treas. Reg. §1.409A-2(a)(7) and the "plan aggregation" rules provided in Treas. Reg. §1.409A-1(c)(2), may be permitted to make an election to defer:

(1) the portion of Base Salary and Commission attributable to services to be performed after such election (in the instance of Commission, determinable pursuant to Treas. Reg. §1.409A-2(a)(12)(i)); and/or

(2) the portion of Annual Bonus and/or Special Bonus equal to the total of such Annual Bonus or Special Bonus multiplied by the ratio of the number of days remaining in the performance period after the election over the total number of days in the performance period applicable to the Participant;

in either case, provided that the Participant submits Participant Election(s) on or before the deadline established by the Committee, which in no event shall be later than 30 days after the Participant first becomes eligible to participate in the Plan and, with respect to Participant Election(s) to defer Annual Bonus or Special Bonus that constitute "performance-based compensation" under Treas. Reg. §1.409A-1(e)), if so determined by the Committee, in no event shall be later than such time that the amount of such Annual Bonus or Special Bonus is readily ascertainable.

(d) Deferral of Share Awards. A Participant may defer Share Awards as set forth in the applicable Participant Election provided by the Company to the Participant, only if such deferral is permitted by the Committee in its sole discretion. A Participant Election provided by the Company for a Share Award shall only be applicable to that Share Award. Notwithstanding and without limitation of the foregoing, any Participant Election with respect to a Share Award shall be submitted no later than December 1 (or such later date as the Committee may authorize in its discretion, but not later than December 31) of the Plan Year immediately preceding the year of grant of such Share Award, based on procedures established by the Committee; unless the Committee has determined, in its sole discretion, that one of the following exceptions applies, has notified the Participant of the applicable election period, procedures, and deadline for filing such Participant Election, and such election complies in all respects with the requirements of Treas. Reg. § 1.409A-2:

(1) If the Participant is an Eligible Executive described in Section 3.3(c) above, the Participant may be permitted to make an election by submitting a Participant Election (in accordance with procedures established by the Committee) as specified in Section 3.3(c) above,

applied as if references to "Base Salary," "Annual Bonus," or "Special Bonus" were references to the Share Award;

(2) To the extent that a Share Award constitutes "performance-based compensation" under Treas. Reg. §1.409A-1(e) based on services performed over a period of at least 12 months, the Participant may be permitted to make an election by submitting a Participant Election (in accordance with procedures established by the Committee) no later than the earlier of: (1) such time that the amount of the Share Award is "readily ascertainable" pursuant to Treas. Reg. § 1.409A-2(a)(8), or (2) the date that is six (6) months before the end of the performance period for such Share Award; provided that the Participant has been performing services continuously from the later of the beginning of such performance period or the date the performance criteria for such Share Award are established through the date the deferral election is made;

(3) With respect to a Share Award that constitutes a "forfeitable right" under Treas. Reg. §1.409A-2(a)(5) (i) to which the Participant has a legally binding right to payment in a subsequent year, and (ii) that is subject to a forfeiture condition requiring the Participant's continued services for a period of at least 12 months from the date the Participant obtains the legally binding right, the Participant may be permitted to make an election by submitting a Participant Election (in accordance with procedures established by the Committee) no later than the 30th day after the Participant obtains the legally binding right to the Share Award, provided that the election is made at least 12 months in advance of the earliest date at which the forfeiture condition could lapse; provided that if the Share Award provides for a waiver of the forfeiture condition upon the Participant's death, disability or upon a change in control, and such event occurs before the end of the 12 month minimum forfeiture period, the Participant's elective deferral election is valid only if the election is timely under the Plan without regard to this Section 3.3(d)(3);

(4) A Share Award that meets the definition of a "short-term deferral" described in Treas. Reg. § 1.409A-1(b)(4) may be deferred in accordance with the rules of Section 6.1(b), applied as if the date the substantial risk of forfeiture (as defined in Treas. Reg. § 1.409A-1(d)) lapses is the date payments were originally scheduled to commence, in compliance with Treas. Reg. § 1.409A-2(a)(4), provided that the Committee may permit for deferred amounts to be payable upon a change in control (as defined in Treas. Reg. § 1.409A-3(i)(5)) without regard to the requirement contained in Section 6.1(b)(2), as permissible under Treas. Reg. § 1.409A-2(a)(4).

(e) Irrevocability. A Participant's deferral election under this Article III shall be irrevocable after the last date prescribed under Section 3.3 for the making of such election; provided, however, that the Committee in its discretion may cancel a deferral election, in accordance with Code Section 409A, in the event of (1) a Participant becoming "disabled" under the meaning in Treas. Reg. §1.409A-3(j)(4)(xii), (2) an Unforeseeable Emergency, or (3) a hardship distribution pursuant to Treas. Reg. §1.401(k)-1(d)(3).

(f) Duration of Compensation Deferral Election. A deferral election made for any Plan Year shall be applicable only for that Plan Year.

ARTICLE IV
COMPANY CONTRIBUTIONS

4.1 Offset Contributions. The Company will credit to each Participant's Deferral Account the amount equal to the employer matching contribution that would have been made for the Participant to the Company 401(k) Plan but that could not be made because of the application of Code Sections 401(a)(17) and 415(c). Any such credit shall be made to a Participant's Deferral Account not later than the latest due date on which any contributions could be made to the Company 401(k) Plan for such Plan Year.

4.2 Discretionary Contributions. The Company may credit to each Participant's Deferral Account the amount, if any, that the Committee determines in its sole discretion to contribute for any Plan Year, which may include, without limitation, a credit with respect to the amount of employer matching contribution that each Participant was unable to be credited under the Company 401(k) Plan as a result of voluntary deferrals to this Plan being excluded from the applicable definition of compensation used under the Company 401(k) Plan to figure participant deferrals under such Company 401(k) Plan. Any discretionary credits under this paragraph shall be determined by the Committee in its sole discretion. If a Participant Separates from Service during a Plan Year, the Company may adjust the contribution or the Deferral Account balance as of the date of termination so that the discretionary credit for the Plan Year of termination reflects only the portion of the Plan Year during which the Participant was employed by the Company. No Participant will have any right to receive a contribution in any Plan Year, irrespective of any contributions made on behalf of the Participant or any other Participant in any past or succeeding years.

ARTICLE V
DEFERRAL ACCOUNTS

5.1 Deferral Accounts. The Committee shall establish and maintain such Deferral Accounts as are necessary for each Participant under the Plan. Each Participant's Deferral Account shall be further divided into Fund Subaccounts, each of which corresponds to a Fund designated pursuant to Section 5.3. A Participant's Deferral Account shall be credited as follows:

(a) As soon as reasonably possible after amounts are withheld and deferred from a Participant's Compensation, the Committee shall credit the Fund Subaccounts of the Participant's Deferral Account an amount equal to Compensation deferred by the Participant in accordance with the designation under Section 5.3; the Committee shall also credit to the Fund Subaccounts of the Participant's Deferral Account the Company contributions described in Sections 4.1 and 4.2 above;

(b) Each business day, each Fund Subaccount of a Participant's Deferral Account shall be credited with earnings or losses in an amount equal to that determined by multiplying the balance credited to such Fund Subaccount as of the prior day, less any distributions valued as of the end of the prior day, by the Interest Rate for the corresponding Fund as determined by the Committee pursuant to Section 5.3;

(c) In the event that a Participant elects a Scheduled In-Service Distribution for a given Plan Year's deferral of Compensation, all amounts attributed to the deferral of

Compensation for such Plan Year shall be accounted for in a manner which allows separate accounting for the deferral of Compensation and investment gains and losses associated with amounts allocated to each such separate Scheduled In-Service Distribution; and

(d) At the discretion of the Committee, shares of Company common stock underlying Share Awards deferred by a Participant under the Plan may be credited with cash or stock dividends paid by the Company in respect of a share of Company common stock. Any such cash or stock dividends may be credited to the Participant's Deferral Account, or may be deemed reinvested by the Committee in additional Share Awards based on the fair market value of a share of Company common stock on the applicable dividend payment date (as determined by the Committee in accordance with the Code) and rounded down to the nearest whole share, and the Participant's Deferral Account shall be credited accordingly.

5.2 Committee Selection of Investment Funds. The Committee shall select from time to time, in its sole and absolute discretion, investment funds, which may be based on Company stock, free-standing, components of variable life insurance policies, or any other underlying investment selected by the Committee, to serve as Funds in which a Participant may deem his or her Deferral Accounts invested pursuant to Section 5.3. The Interest Rate of each such investment shall be used to determine the amount of earnings or losses to be credited to the Participant's Deferral Account under Section 5.1. The Participant's choice among investments shall be solely for purposes of calculation of the Interest Rate on Accounts. The Company shall have no obligation to set aside or invest amounts as directed by the Participant and, if the Company elects to invest amounts as directed by the Participant, the Participant shall have no more right to such investments than any other unsecured general creditor.

5.3 Participant Fund Election. At the time of entering the Plan and/or of making a deferral election under the Plan, or at such other time as provided by the Committee, the Participant shall designate, according to such procedures and restrictions as may be promulgated by the Committee, the Funds in which the Participant's Deferral Accounts shall be deemed to be invested for purposes of determining the amount of earnings and losses to be credited to each Deferral Account. The Participant may specify that all or any percentage of his or her Deferral Accounts shall be deemed to be invested, in whole percentage increments, in one or more of the Funds selected as alternative investments under the Plan from time to time by the Committee pursuant to Section 5.2, subject to any restrictions and procedures established by the Committee. If a Participant fails to make an election among the Funds as described in this Section, the Participant's Account balance shall automatically be allocated into the default Fund(s) selected by the Committee. A Participant may change any designation made under this Section as permitted by the Committee by filing a revised election, on a Participant Election provided by the Committee. Notwithstanding the foregoing, the Committee, in its sole discretion, may impose limitations on the frequency with which or time at which one or more of the Funds elected in accordance with this Section may be added or deleted by such Participant; furthermore, the Committee, in its sole discretion, may impose limitations on the frequency with which or time at which the Participant may change the portion of his or her Deferral Account balance allocated to each previously or newly elected Fund.

5.4 Trust. The Company shall be responsible for the payment of all benefits under the Plan. At its discretion, the Company may (but shall not be obligated to) establish one or more grantor trusts for the purpose of providing for payment of benefits under the Plan. Such trust or trusts may be irrevocable, but the assets thereof shall be subject to the claims of the Company's creditors. Benefits paid to the Participant from any such trust or trusts shall be considered paid by the Company for purposes of meeting the obligations of the Company under the Plan.

5.5 Statement of Accounts. The Committee shall provide each Participant with electronic statements at least quarterly setting forth the Participant's Deferral Account balance as of the end of each applicable period.

5.6 Vesting of Deferral Accounts. The Participant shall be vested at all times in all amounts credited to the Participant's Deferral Account(s).

ARTICLE VI
DISTRIBUTIONS

6.1 Distribution Elections.

(a) Initial Election. At the time of making a deferral election under the Plan, the Participant shall designate the time and form of distribution of deferrals made pursuant to such election (together with any earnings credited thereon) from among the alternatives specified under this Article VI for the applicable distribution. Notwithstanding the foregoing, all amounts credited to each Participant's Deferral Account by the Company pursuant to Article IV will not be subject to any elections and will be distributed in accordance with Section 6.6.

(b) Modification of Election. A distribution election with respect to previously deferred amounts may only be changed pursuant to the terms and conditions specified in Code Section 409A and this Section. Except as permitted under Code Section 409A, no acceleration of a distribution is permitted. A subsequent election shall be permitted only if all of the following requirements are met:

(1) the new election does not take effect until at least twelve (12) months after the date on which the new election is made;

(2) the new election delays payment for at least five (5) years from the date that payment would otherwise have been made, absent the new election, unless otherwise permitted by Treas. Reg. §1.409A-2(b)(1)(ii); and

(3) the new election is made not less than twelve (12) months before the date on which payment would have been made (or, in the case of installment payments, the first installment payment would have been made) absent the new election.

Participants may make a subsequent election only while employed by the Company, and may only make a single subsequent election with respect to any deferral election. A Beneficiary of a deceased Participant is not permitted to make a subsequent election under this Section. Election changes made pursuant to this Section shall be made in accordance with rules established by the Committee and shall comply with all requirements of Code Section 409A and applicable authorities.

6.2 Distributions of Employee Deferrals Upon Separation from Service.

(a) Timing and Form of Distributions of Employee Deferrals Upon Separation from Service. Except as otherwise provided herein (including if a Participant fails to make a timely distribution election in accordance with Section 6.1) in the event of a Participant's Separation from Service, the distributable amount credited to the Participant's Deferral Accounts attributable to deferral elections pursuant to ARTICLE III shall be paid in one lump sum payment on the first Payment Date following the expiration of six (6) months from Participant's Separation from Service, unless: (i) the Participant has made a distribution election on a timely basis to receive decrementing counter annual installments over a period of up to ten (10) years following Separation from Service, (ii) distributions to the Participant have commenced as of the Participant's Separation from Service pursuant to a Scheduled In-Service Distribution Election, in which case those Scheduled In-Service Distributions shall continue in effect, (iii) all distributable amounts have already been paid out to Participant pursuant to a lump sum payment election upon Death or Disability, or (iv) otherwise required by the application of Section 3.3(d)(4) or Section 6.1(b).

(b) Payment Delay Period. A Participant may elect for payment of the lump sum payment or first annual installment (as applicable) payable pursuant to the first sentence of Section 6.2(a) to be made on the first Payment Date following the expiration of a period beginning on the date of Participant's Separation from Service and ending on a date chosen by Participant that is between six (6) months and three (3) years from such Separation from Service (the "Payment Delay Period"), or such longer period if required by the application of Section 3.3(d)(4) or Section 6.1(b). In the case of annual installment distributions, subsequent installments shall be made in each successive year by the first of the month in which the first annual installment was made.

6.3 Distributions of Employee Deferrals Upon Disability.

(a) Prior to Commencement of Benefits. In the event of a Participant's Disability prior to commencement of a benefit described in this ARTICLE IV, if timely elected by the Participant in accordance with ARTICLE III and Section 6.1, the Participant may receive the distributable amount credited to the Participant's Deferral Accounts attributable to deferral elections pursuant to ARTICLE III in a lump sum payment on the Payment Date following the Participant's Disability, regardless of the form of payment otherwise designated by the Participant pursuant to Section 6.2(a) or Section 6.5(a).

(b) After Commencement of Benefits. In the event of a Participant's Disability after commencement of a benefit described in this ARTICLE VI, if timely elected by the Participant in accordance with ARTICLE III and Section 6.1, the Participant may receive the remaining distributable amount credited to the Participant's Deferral Accounts attributable to deferral elections pursuant to ARTICLE III in a lump sum payment of cash on the Payment Date following the Participant's Disability, regardless of the form of payment otherwise designated by the Participant pursuant to Section 6.2(a) or Section 6.5(a).

6.4 Distributions of Employee Deferrals Upon Death.

(a) Prior to Commencement of Benefits. In the event of a Participant's death prior to commencement of a benefit described in this Article VI, if timely elected by the Participant in accordance with ARTICLE III and Section 6.1, the Participant's Beneficiary may receive the distributable amount credited to the Participant's Deferral Accounts attributable to deferral elections pursuant to ARTICLE III in a lump sum payment of cash on the Payment Date following the Participant's death, regardless of the form of payment otherwise designated by the Participant pursuant to Section 6.2(a) or Section 6.5(a).

(b) After Commencement of Benefits. In the event of a Participant's death after commencement of a benefit described in this Article VI, if timely elected by the Participant in accordance with ARTICLE III and Section 6.1, the Participant's Beneficiary may receive the remaining distributable amount credited to the Participant's Deferral Accounts attributable to deferral elections pursuant to ARTICLE III in a lump sum payment of cash on the Payment Date following the Participant's death, regardless of the form of payment otherwise designated by the Participant pursuant to Section 6.2(a) or Section 6.5(a).

6.5 Scheduled In-Service Distributions of Employee Deferrals.

(a) Scheduled In-Service Distribution Election. Participants shall be entitled to elect to receive a Scheduled In-Service Distribution from a Deferral Account of amounts attributable to deferral elections pursuant to ARTICLE III. If a Participant has a Separation from Service with the Company prior to commencement of payment of the Scheduled In-Service Distribution, distribution will not be made pursuant to this Section 6.5(a) but will instead be made pursuant to Section 6.2(a) above. In the case of a Participant who has elected to receive a Scheduled In-Service Distribution, such Participant shall receive the distributable amount, with respect to the specified deferrals, including earnings thereon, which have been elected by the Participant to be subject to such Scheduled In-Service Distribution election. The Committee shall determine the earliest commencement date that may be elected by the Participant for each Scheduled In-Service Distribution and such date shall be indicated on the Participant Election, provided that such date may not be earlier than three (3) years from the date of the respective election (or such longer period as required under Section 3.3(d)(4) or Section 6.1(b)). The Participant may elect to receive the Scheduled In-Service Distribution in a single lump sum or in decrementing counter annual installments over a period of up to ten (10) years. The lump sum payment or first annual installment (as applicable) payable pursuant to foregoing sentence will be made on the first Payment Date following the commencement date elected by Participant. A Participant may delay and change the form of a Scheduled In-Service Distribution, provided such extension complies with the requirements of Section 6.1(b).

(b) Relationship to Other Benefits. In the event that distribution of a Participant's Deferral Account is triggered under Sections 6.2, 6.3, or 6.4 prior to commencement of a Scheduled In-Service Distribution, the amounts subject to such Scheduled In-Service Distribution shall not be distributed under this Section 6.5, but rather shall be distributed in accordance with the other applicable Section of this Article VI.

6.6 Distribution of Company Contributions. Notwithstanding anything to the contrary in this Article VI, all amounts credited to each Participant's Deferral Account by the Company pursuant to Article VI shall be paid in one lump sum payment on the first Payment Date following the expiration of six (6) months from Participant's Separation from Service. For the avoidance of doubt, no Company contributions under this Plan shall be subject to Participant election pursuant to this Article VI.

6.7 Form of Distribution. Generally, distributions from the Plan shall be made in the form of cash, unless the Committee determines that such distributions shall be made in property.

6.8 Timing of Distribution. Payment of all distributions from the Plan shall be made on the first of the month or as soon as administratively practicable following such date, provided that in no instance shall a distribution be made later than the tenth of the month, in compliance with Treas. Reg. §1.409A-3(d).

6.9 Distribution of Small Benefit. Notwithstanding any initial election under Section 6.1(a), modification of election in Section 6.1(b), or any other provision of the Plan to the contrary, if the amount credited to the Participant's Deferral Account, plus the Participant's vested interest in any other plan or plans required to be aggregated with this Plan under Code Section 409A, is equal to or less than the applicable dollar amount under Section 402(g)(1)(B) of the Code (which is $19,500 for 2021), the Committee may, in its sole discretion, direct that such amount (and such other interest(s)) be distributed to the Participant (or Beneficiary, as applicable) in one lump-sum payment, provided that such exercise of discretion is evidenced in writing no later than the date of such payment.

6.10 Unforeseeable Emergency. Upon a finding that the Participant has suffered an Unforeseeable Emergency, in accordance with Code Section 409A and Treas. Reg. §1.409A-3(i)(3), the Committee may, at the request of the Participant, accelerate distribution of benefits and/or approve cancellation of deferral elections under the Plan, subject to the following conditions:

(a) the request to take an Unforeseeable Emergency distribution shall be made by filing a form provided by and filed with the Committee prior to the end of any calendar month;

(b) upon a finding that the Participant has suffered an Unforeseeable Emergency under Code Section 409A, the Committee may, at the request of the Participant, accelerate distribution of benefits and/or approve cancellation of current deferral elections (pursuant to Section 3.3(e)) under the Plan in the amount reasonably necessary to alleviate such Unforeseeable Emergency; the amount distributed pursuant to this Section with respect to the Unforeseeable Emergency shall not exceed the amount necessary to satisfy such Unforeseeable Emergency, plus amounts necessary to pay taxes reasonably anticipated as a result of the distribution, after taking into account the extent to which such hardship is or may be relieved through reimbursement or compensation by insurance or otherwise or by liquidation of the Participant's assets (to the extent the liquidation of such assets would not itself cause severe financial hardship); and

(c) the amount (if any) determined by the Committee as an Unforeseeable Emergency distribution shall be paid in a single cash lump sum as soon as practicable after the end of the calendar month in which the Unforeseeable Emergency determination is made by the Committee.

ARTICLE VII
BENEFICIARY DESIGNATIONS AND OTHER PAYEES

7.1 Beneficiaries.

(a) Beneficiary Designation. The Participant shall have the right, at any time, to designate any person or persons as Beneficiary (both primary and contingent) to whom payment under the Plan shall be made in the event of the Participant's death. No consent of the Participant's spouse or any other person is required for the Participant to name a Beneficiary. The Beneficiary designation shall be effective when it is submitted to and acknowledged by the Committee during the Participant's lifetime in the format prescribed by the Committee.

(b) Absence of Valid Designation. If a Participant fails to designate a Beneficiary, as provided above, or if every person designated as Beneficiary predeceases the Participant or dies prior to complete distribution of the Participant's benefits, then the Participant's estate shall be deemed to be the Beneficiary and the Committee shall direct the distribution of such benefits to the Participant's estate.

7.2 Payments to Minors. In the event any amount is payable under the Plan to a minor, payment shall not be made to the minor, but instead such payment shall be made (a) to that person's living parent(s) to act as custodian or (b) if that person's parents are then divorced, and one parent is the sole custodial parent, to such custodial parent, to act as custodian. If no parent is living and the Committee decides not to select another custodian to hold the funds for the minor, then payment shall be made to the duly appointed and currently acting guardian of the estate for the minor or, if no guardian of the estate for the minor is duly appointed and currently acting within 60 days after the date the amount becomes payable, payment shall be deposited with the court having jurisdiction over the estate of the minor.

7.3 Payments on Behalf of Persons Under Incapacity. In the event that any amount becomes payable under the Plan to a person who, in the sole judgment of the Committee, is considered by reason of physical or mental condition to be unable to give a valid receipt therefore, the Committee may direct that such payment be made to any person found by the Committee, in its sole judgment, to have assumed the care of such person. Any payment made pursuant to such determination shall constitute a full release and discharge of any and all liability of the Committee and the Company under the Plan.

ARTICLE VIII
LEAVE OF ABSENCE

8.1 Paid Leave of Absence. If a Participant is authorized by the Company to take a paid leave of absence from the employment of the Company, and such leave of absence does not constitute a Separation from Service, (a) the Participant shall continue to be considered eligible for the benefits provided under the Plan, and (b) deferrals shall continue to be withheld during such paid leave of absence in accordance with Article III.

8.2 Unpaid Leave of Absence. If a Participant is authorized by the Company to take an unpaid leave of absence from the employment of the Company for any reason, and such leave of absence does not constitute a Separation from Service, such Participant shall continue to be eligible for the benefits provided under the Plan. During the unpaid leave of absence, the Participant shall not be allowed to make any additional deferral elections. However, if the Participant returns to employment, the Participant may elect to defer for the Plan Year following his or her return to employment and for every Plan Year thereafter while a Participant in the Plan, provided such deferral elections are otherwise allowed and a Participant Election is delivered to and accepted by the Committee for each such election in accordance with Article III above.

ARTICLE IX
ADMINISTRATION

9.1 Committee. The Plan shall be administered by a Committee appointed by the Board; provided, that if the Board does not appoint a Committee, the Board shall act as the Committee. The Committee shall have the exclusive right and full discretion (a) to appoint agents, designees and delegates to act on its behalf, (b) to select and establish Funds, (c) to interpret the Plan, (d) to decide any and all matters arising hereunder (including the right to remedy possible ambiguities, inconsistencies, or admissions), (e) to make, amend and rescind such rules as it deems necessary for the proper administration of the Plan, and (f) to make all other determinations and resolve all questions of fact necessary or advisable for the administration of the Plan, including determinations regarding eligibility for benefits payable under the Plan. All interpretations of the Committee with respect to any matter hereunder shall be final, conclusive and binding on all persons affected thereby. No member of the Committee or agent thereof shall be liable for any determination, decision, or action made in good faith with respect to the Plan. The Company will indemnify and hold harmless the members of the Committee and its agents from and against any and all liabilities, costs, and expenses incurred by such persons as a result of any act, or omission, in connection with the performance of such persons' duties, responsibilities, and obligations under the Plan, other than such liabilities, costs, and expenses as may result from the bad faith, willful misconduct, or criminal acts of such persons.

9.2 Claims Procedure.

(a) Filing of a Claim. Any Participant, Beneficiary, or any duly authorized representative may file a claim for a Plan benefit to which the claimant believes that he or she is entitled. Such a claim must be in writing and delivered to the Committee in person or by certified mail, postage prepaid.

(b) Initial Determination of Claim.

(1) Committee Discretion. The Committee will have full discretion to deny or grant any claim in whole or in part.

(2) Claims (Other than Disability Claims). For all claims other than Disability Claims, within 90 days after receipt of such claim, the Committee will send to the claimant by certified mail, postage prepaid, notice of the granting or denying, in whole or in part, of such claim, unless special circumstances require an extension of time for processing the claim. In no event may the extension exceed 90 days from the end of the initial period. If such extension is necessary, the claimant will be given a notice to this effect prior to the expiration of the initial 90 day period. If the Committee fails to notify the claimant either that his or her claim has been granted or that it has been denied in whole or in part within the initial 90 day period or prior to the

expiration of an extension, if applicable, then the claim shall be deemed to have been denied as of the last day of the applicable period, and the claimant then may request a review of his or her claim.

(3) Disability Claims. If a claim is related to any distribution or rights to which a Participant or other claimant may be entitled in connection with the Participant's Disability ("Disability Claim") then, as soon as reasonable but within 45 days after receipt of such claim, the Committee will send to the claimant by certified mail, postage prepaid, notice of the granting or denying, in whole or in part of such claim. This period within which the Committee must provide such notice may be extended twice, for up to 30 days per extension, provided that the Committee (i) determines that an extension is needed and beyond the control of the Plan, and (ii) notifies the claimant prior to the expiration of the initial 45 day period or of the first 30-day extension period. In the case of any extension request, the notice of extension shall specifically explain the standards on which entitlement to a benefit is based, the unresolved issues that prevent a decision on the claim, and the additional information needed to resolve those issues, and the claimant shall be afforded at least 45 days within which to provide the specified information. If the Committee fails to notify the claimant either that his or her claim has been granted or that it has been denied in whole or in part within the initial 45 day period or prior to the expiration of an extension, if applicable, then the claim shall be deemed to have been denied as of the last day of the applicable period, and the claimant then may request a review of his or her claim. The Committee must ensure that all Disability Claims and appeals are adjudicated in a manner designed to ensure the independence and impartiality of the persons involved in making the Disability determination.

(c) Duty of Committee Upon Denial of Claim.

(1) Claims (Other than Disability Claims). The Committee will provide to every claimant who is denied a claim for benefits notice setting forth, in a manner calculated to be understood by the claimant, the following:

(i) The specific reason or reasons for the denial;

(ii) Specific reference to pertinent Plan provisions on which the denial is based;

(iii) A description of any additional material or information necessary for the claimant to perfect the claim and an explanation of why such material is necessary; and

(iv) Appropriate information as to the steps to be taken if the claimant wishes to submit his or her claim for review.

(2) Disability Claims. The Committee will provide to every claimant whose Disability Claim is denied a notice written in a culturally and linguistically appropriate manner, including information on how to access non-English language services provided by the Plan. The notice of the denial shall set forth the information contained in Section 9.2(c)(1) as well as set forth:

(i) An explanation of the basis for any disagreement with:

(1) the views of the health care professional(s) who treated or evaluated the claimant;

(2) the views of medical experts whose advice was obtained on behalf of the Plan in connection with the denial of the claimant's Disability Claim; and

(3) a disability determination made by the Social Security Administration;

(ii) Either the specific internal rules or standards the Plan relied upon in denying the Disability Claim, or alternatively, a statement that such rules or standards do not exist;

(iii) A statement that the claimant is entitled to receive, upon request and free of charge all documents and records relevant to the claimant's Disability Claim; and

(iv) A statement of any Plan limitation periods, including the expiration date, that apply to the claimant's right to bring a civil action under Section 502(a) of ERISA.

(d) Request for Review of Claim Denial.

(1) Review of Claims (Other than Disability Claims). If any claim, other than a Disability Claim, is denied, the claimant or the claimant's duly authorized representative, upon written application to the Committee in person or by certified mail, postage prepaid, may request a review of such denial, may review pertinent documents, and may submit issues and comments in writing. A claimant must file such written request for review with the Committee within 60 days after the receipt by the claimant of a notice denying the initial claim or within 60 days after the claim is deemed to be denied. Upon its receipt of the request for review, the Committee will notify the Company of the request. Upon its receipt of notice of a request for review, the Company will appoint a person other than a member of the Committee to be the claims reviewer. The decision on review shall be rendered not later than 60 days after the Committee's receipt of the claimant's request for review, unless special circumstances require an extension of time for processing, in which case the 60 day period may be extended to 120 days if notice is provided to the claimant in writing within the initial 60 day period stating the reason for the extension. If notice of the decision on the review is not furnished in accordance with this subsection (1), the claim will be deemed denied and the claimant will be permitted to exercise his or her right to legal remedy pursuant to Section 9.2(f).

(2) Review of Disability Claims. If a Disability Claim is denied, the claimant or the claimant's duly authorized representative, upon written application to the Committee in person or by certified mail, postage prepaid, may request a review of such denial, may review pertinent documents, and may submit issues and comments in writing. A claimant must file such written request for review with the Committee within 180 days after the receipt by

the claimant of a notice denying the initial claim or within 180 days after the claim is deemed to be denied. Upon its receipt of the request for review, the Committee will notify the Company of the request and the Company will appoint a person other than a member of the Committee to be the claims reviewer. Upon its receipt of the request for review, the Committee must provide the claimant, free of charge, and as soon as possible, any new or additional evidence considered or the rationale in connection with the Disability Claim. Such information must be provided in advance of the date on which the notice of the denial of the appeal is required to be provided, as discussed below in Section 9.2(e)(1), in order to give the claimant a reasonable opportunity to respond prior to that date. The decision on review shall be rendered not later than 45 days after the Committee's receipt of the claimant's request for review, unless special circumstances require an extension of time for processing, in which case the 45 day period may be extended to 90 days if notice is provided to the claimant in writing within the initial 45 day period stating the reason for the extension. If notice of the decision on the review is not furnished in accordance with this subsection (2), the claim will be deemed denied and the claimant will be permitted to exercise his or her right to legal remedy pursuant to Section 9.2(f).

(e) Claims Reviewer. The Committee will deliver to the claims reviewer all documents pertinent to the review. The claims reviewer will make a prompt decision on the review. The decision on review will be written in a manner calculated to be understood by the claimant, and will include specific reasons for the decision and specific references to the pertinent Plan provisions on which the decision is based.

(1) For Disability Claims, the Committee shall provide written notification of its decision to the claimant in a culturally and linguistically appropriate manner, including information on how to access non-English language services provided by the Plan. The notification shall include the information required to be included in the notice of the denial discussed in Section 9.2(c)(2). The decision (regardless of whether it is adverse to the claimant) shall be made within a reasonable time period but not later than 45 days after receipt of the claimant's request for review, unless the claims reviewer determines that special circumstances require an extension of time to process the claim. If such an extension is required, written notice of the extension must be furnished to the claimant before the end of the initial 45 day period, explaining the special circumstances and the time and date a determination can be expected. In no event shall the extension exceed a period of 45 days from the end of the initial period.

(f) Legal Remedy. After exhaustion of the claims procedure as provided under this Plan, nothing will prevent any person from pursuing any other legal remedy.

(1) For Disability Claims.

(i) If the Plan fails to strictly adhere to all the procedures of this Section 9.2 with respect to a Disability Claim, and unless subsection (ii) applies, the claimant is deemed to have exhausted the administrative remedies available under the Plan and is entitled to pursue any available remedies under Section 502(a) of ERISA. Under such circumstances, the Disability Claim or appeal is deemed denied on review without the exercise of discretion by an appropriate fiduciary.

(ii) A claimant will not be deemed to have exhausted the administrative remedies available under the Plan if:

(1) The violations of the procedure are de minimis and do not cause, and are not likely to cause, prejudice or harm to the claimant, and

(2) The Committee demonstrates that the violation was for good cause or due to matters beyond the control of the claims reviewer and that the violation occurred in the context of an ongoing, good faith exchange of information between the claims reviewer and the claimant.

This subsection (ii) is not available if the violation is a part of a pattern or practice of violations by the Plan. The claimant may request a written explanation of the violation from the Committee and the Committee must provide such explanation within 10 days, including a specific description of its basis, if any, for asserting that the violation should not cause the procedures to be deemed exhausted. If a court rejects the claimant's request for immediate review on the basis that the Plan met the standards for the exception under subsection (ii), the Disability Claim shall be considered as refiled on appeal upon the Committee's receipt of the decision of the court, and the Committee must provide the claimant with notice of the resubmission within a reasonable period of time after the receipt of the court's decision.

ARTICLE X
MISCELLANEOUS

10.1 Termination of Plan. The Company may terminate the Plan at any time. In the event of a Plan termination, no new deferral elections shall be permitted. However, after the Plan termination the Deferral Account balances of such Participants shall continue to be credited with deferrals attributable to any deferral election that was in effect prior to the Plan termination to the extent necessary to comply with Code Section 409A, and additional amounts shall continue to be credited or debited to such Participants' Account balances pursuant to Article V. In addition, following a Plan termination, Participant Account balances shall remain in the Plan and shall not be distributed until such amounts become eligible for distribution in accordance with the other applicable provisions of the Plan. Notwithstanding the preceding sentence, to the extent permitted by Treas. Reg. §1.409A-3(j)(4)(ix) or as otherwise permitted under Code Section 409A, the Company may provide that upon termination of the Plan, all Deferral Account balances of the Participants shall be distributed, subject to and in accordance with any rules established by the Company deemed necessary to comply with Code Section 409A.

10.2 Amendment. The Company may, at any time, amend or modify the Plan in whole or in part. Notwithstanding the foregoing, no amendment or modification shall be effective to decrease the value of a Participant's vested Account balance in existence at the time the amendment or modification is made.

10.3 Unsecured General Creditor. The benefits paid under the Plan shall be paid from the general assets of the Company, and the Participant and any Beneficiary or their heirs or successors shall be no more than unsecured general creditors of the Company with no special or prior right to any assets of the Company for payment of any obligations hereunder. It is the intention of the Company that this Plan be unfunded for purposes of ERISA and the Code.

10.4 Restriction Against Assignment. The Company shall pay all amounts payable hereunder only to the person or persons designated by the Plan and not to any other person or entity. No part of a Participant's Accounts shall be liable for the debts, contracts, or engagements of any Participant, Beneficiary, or their successors in interest, nor shall a Participant's Accounts be subject to execution by levy, attachment, or garnishment or by any other legal or equitable proceeding, nor shall any such person have any right to alienate, anticipate, sell, transfer, commute, pledge, encumber, or assign any benefits or payments hereunder in any manner whatsoever. No part of a Participant's Accounts shall be subject to any right of offset against or reduction for any amount payable by the Participant or Beneficiary, whether to the Company or any other party, under any arrangement other than under the terms of this Plan.

10.5 Withholding. The Participant shall make appropriate arrangements with the Company for satisfaction of any federal, state or local income tax withholding requirements, Social Security and other employee tax or other requirements applicable to the granting, crediting, vesting or payment of benefits under the Plan. There shall be deducted from each payment made under the Plan or any other Compensation payable to the Participant (or Beneficiary) all taxes that are required to be withheld by the Company in respect to such payment or this Plan. To the extent permissible under Code Section 409A, the Company shall have the right to reduce any payment (or other Compensation) by the amount of cash sufficient to provide the amount of said taxes.

10.6 Code Section 409A. The Company intends that the Plan comply with the requirements of Code Section 409A (and all applicable Treasury Regulations and other guidance issued thereunder) and shall be operated and interpreted consistent with that intent.

10.7 Effect of Payment. Any payment made in good faith to a Participant or the Participant's Beneficiary shall, to the extent thereof, be in full satisfaction of all claims against the Committee, its members, and the Company.

10.8 Errors in Account Statements, Deferrals or Distributions. In the event an error is made in an Account statement, such error shall be corrected on the next statement following the date such error is discovered. In the event of an operational error, including, but not limited to, errors involving deferral amounts, overpayments or underpayments, such operational error shall be corrected in a manner consistent with and as permitted by any correction procedures established under Code Section 409A. If any portion of a Participant's Account(s) under this Plan is required to be included in income by the Participant prior to receipt due to a failure of this Plan to comply with the requirements of Code Section 409A, the Committee may determine that such Participant shall receive a distribution from the Plan in an amount equal to the lesser of (i) the portion of his or her Account required to be included in income as a result of the failure of the Plan to comply with the requirements of Code Section 409A, or (ii) the unpaid vested Account balance.

10.9 Domestic Relations Orders. Notwithstanding any provision in this Plan to the contrary, in the event that the Committee receives a domestic relations order, as defined in Code Section 414(p)(1)(B), pursuant to which a court has determined that a spouse or former spouse of a Participant has an interest in the Participant's benefits under the Plan, the Committee shall have the right to immediately distribute the spouse's or former spouse's vested interest in the Participant's benefits under the Plan to such spouse or former spouse to the extent necessary to fulfill such domestic relations order, provided that such distribution is in accordance with the requirements of Code Section 409A.

10.10 Employment Not Guaranteed. Nothing contained in the Plan, nor any action taken hereunder, shall be construed as a contract of employment or as giving any Participant any right to continue the provision of services in any capacity whatsoever to the Company.

10.11 No Guarantee of Tax Consequences. The Company, Board, and Committee make no commitment or guarantee to any Participant that any federal, state or local tax treatment will apply or be available to any person eligible for benefits under the Plan and assume no liability whatsoever for the tax consequences to any Participant.

10.12 Successors of the Company. The rights and obligations of the Company under the Plan shall inure to the benefit of, and shall be binding upon, the successors and assigns of the Company.

10.13 Notice. Any notice or filing required or permitted to be given to the Company or the Participant under this Agreement shall be sufficient if in writing and hand-delivered, or sent by registered or certified mail, in the case of the Company, to the principal office of the Company, directed to the attention of the Committee, and in the case of the Participant, to the last known address of the Participant indicated on the employment records of the Company. Such notice shall be deemed given as of the date of delivery or, if delivery is made by mail, as of the date shown on the postmark on the receipt for registration or certification. Notices to the Company may be permitted by electronic communication according to specifications established by the Committee.

10.14 Headings. Headings and subheadings in this Plan are inserted for convenience of reference only and are not to be considered in the construction of the provisions hereof.

10.15 Gender, Singular and Plural. All pronouns and any variations thereof shall be deemed to refer to the masculine, feminine, or neuter, as the identity of the person or persons may require. As the context may require, the singular may be read as the plural and the plural as the singular.

10.16 Governing Law. The Plan is intended to be an unfunded plan maintained primarily to provide deferred compensation benefits for a select group of “management or highly compensated employees” within the meaning of Sections 201, 301 and 401 of ERISA and therefore to be exempt from Parts 2, 3 and 4 of Title I of ERISA. To the extent any provision of, or legal issue relating to, this Plan is not fully preempted by federal law, such issue or provision shall be governed by the laws of the State of Delaware.

IN WITNESS WHEREOF, the undersigned duly authorized officer of the Company has approved the adoption of this Plan on behalf of the Company.

ADVANCED ENERGY INDUSTRIES, INC.

By: /s/ Rory O’Byrne

Print Name: Rory O’Byrne

Title: Senior Vice President & Chief Human Resources Officer

EXHIBIT 31.1

I, Stephen D. Kelley, certify that:

1. I have reviewed this quarterly report on Form 10-Q for the period ended September 30, 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: November 1, 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 September 30, 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: November 1, 2022

/s/ Paul Oldham
Paul Oldham
Chief Financial Officer and 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 September 30, 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: November 1, 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 September 30, 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: November 1, 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.