

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

Form 10-Q

(Mark one)

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

For the quarterly period ended March 31, 2023

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: 001-33156



First Solar

First Solar, Inc.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

20-4623678

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

350 West Washington Street, Suite 600
Tempe, Arizona 85288

(Address of principal executive offices, including zip code)

(602) 414-9300

(Registrant's telephone number, including area code)

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

<u>Title of each class</u>	<u>Trading symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common stock, \$0.001 par value	FSLR	The NASDAQ Stock Market LLC

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, 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	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>	Non-accelerated filer	<input type="checkbox"/>
Smaller reporting company	<input type="checkbox"/>	Emerging growth company	<input type="checkbox"/>		

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

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

As of April 21, 2023, 106,825,674 shares of the registrant's common stock, \$0.001 par value per share, were outstanding.

FIRST SOLAR, INC.

FORM 10-Q FOR THE QUARTERLY PERIOD ENDED MARCH 31, 2023

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Throughout this Quarterly Report on Form 10-Q, we refer to First Solar, Inc. and its consolidated subsidiaries as “First Solar,” “the Company,” “we,” “us,” and “our.” When referring to our manufacturing capacity, total sales, and solar module sales, the unit of electricity in watts for megawatts (“MW”) and gigawatts (“GW”) is direct current (“DC” or “_{DC}”) unless otherwise noted.

PART I. FINANCIAL INFORMATION

Item 1. Condensed Consolidated Financial Statements (Unaudited)

FIRST SOLAR, INC. **CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS** (In thousands, except per share amounts) (Unaudited)

	Three Months Ended March 31,	
	2023	2022
Net sales	\$ 548,286	\$ 367,040
Cost of sales	436,235	355,577
Gross profit	112,051	11,463
Operating expenses:		
Selling, general and administrative	44,028	36,728
Research and development	30,510	27,108
Production start-up	19,494	7,338
Total operating expenses	94,032	71,174
Gain on sales of businesses, net	(17)	1,907
Operating income (loss)	18,002	(57,804)
Foreign currency loss, net	(5,947)	(4,198)
Interest income	25,822	2,325
Interest expense, net	(748)	(2,865)
Other expense, net	(1,456)	(212)
Income (loss) before taxes	35,673	(62,754)
Income tax benefit	6,888	19,499
Net income (loss)	\$ 42,561	\$ (43,255)
Net income (loss) per share:		
Basic	\$ 0.40	\$ (0.41)
Diluted	\$ 0.40	\$ (0.41)
Weighted-average number of shares used in per share calculations:		
Basic	106,675	106,412
Diluted	107,154	106,412

See accompanying notes to these condensed consolidated financial statements.

FIRST SOLAR, INC.
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(In thousands)
(Unaudited)

	Three Months Ended March 31,	
	2023	2022
Net income (loss)	\$ 42,561	\$ (43,255)
Other comprehensive income (loss):		
Foreign currency translation adjustments	2,655	(10,125)
Unrealized gain (loss) on marketable securities and restricted marketable securities, net of tax of \$(402) and \$1,246	6,966	(22,521)
Unrealized gain (loss) on derivative instruments, net of tax of \$(708) and \$94	2,214	(442)
Other comprehensive income (loss)	11,835	(33,088)
Comprehensive income (loss)	<u>\$ 54,396</u>	<u>\$ (76,343)</u>

See accompanying notes to these condensed consolidated financial statements.

FIRST SOLAR, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
(In thousands, except share data)
(Unaudited)

	March 31, 2023	December 31, 2022
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 906,634	\$ 1,481,269
Marketable securities	1,364,607	1,096,712
Accounts receivable trade, net	298,620	324,337
Accounts receivable unbilled	25,894	30,654
Inventories	751,407	621,376
Other current assets	272,702	237,073
Total current assets	3,619,864	3,791,421
Property, plant and equipment, net	3,858,604	3,536,902
Deferred tax assets, net	136,411	78,680
Restricted marketable securities	196,591	182,070
Government grants receivable	70,114	—
Goodwill	14,462	14,462
Intangible assets, net	28,477	31,106
Inventories	253,353	260,395
Other assets	386,720	356,192
Total assets	\$ 8,564,596	\$ 8,251,228
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 285,760	\$ 341,409
Income taxes payable	77,176	29,397
Accrued expenses	391,912	382,782
Deferred revenue	398,694	263,215
Other current liabilities	20,631	21,245
Total current liabilities	1,174,173	1,038,048
Accrued solar module collection and recycling liability	130,258	128,114
Long-term debt	320,378	184,349
Deferred revenue	949,687	944,725
Other liabilities	121,372	119,937
Total liabilities	2,695,868	2,415,173
Commitments and contingencies		
Stockholders' equity:		
Common stock, \$0.001 par value per share; 500,000,000 shares authorized; 106,825,067 and 106,609,094 shares issued and outstanding at March 31, 2023 and December 31, 2022, respectively	107	107
Additional paid-in capital	2,865,753	2,887,476
Accumulated earnings	3,182,850	3,140,289
Accumulated other comprehensive loss	(179,982)	(191,817)
Total stockholders' equity	5,868,728	5,836,055
Total liabilities and stockholders' equity	\$ 8,564,596	\$ 8,251,228

See accompanying notes to these condensed consolidated financial statements.

FIRST SOLAR, INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In thousands)
(Unaudited)

Three Months Ended March 31, 2023						
	Common Stock		Additional Paid-In Capital	Accumulated Earnings	Accumulated Other Comprehensive Loss	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2022	106,609	\$ 107	\$ 2,887,476	\$ 3,140,289	\$ (191,817)	\$ 5,836,055
Net income	—	—	—	42,561	—	42,561
Other comprehensive income	—	—	—	—	11,835	11,835
Common stock issued for share-based compensation	364	—	—	—	—	—
Tax withholding related to vesting of restricted stock	(148)	—	(28,314)	—	—	(28,314)
Share-based compensation expense	—	—	6,591	—	—	6,591
Balance at March 31, 2023	106,825	\$ 107	\$ 2,865,753	\$ 3,182,850	\$ (179,982)	\$ 5,868,728
Three Months Ended March 31, 2022						
	Common Stock		Additional Paid-In Capital	Accumulated Earnings	Accumulated Other Comprehensive Loss	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2021	106,332	\$ 106	\$ 2,871,352	\$ 3,184,455	\$ (96,362)	\$ 5,959,551
Net loss	—	—	—	(43,255)	—	(43,255)
Other comprehensive loss	—	—	—	—	(33,088)	(33,088)
Common stock issued for share-based compensation	414	1	—	—	—	1
Tax withholding related to vesting of restricted stock	(163)	—	(11,505)	—	—	(11,505)
Share-based compensation expense	—	—	3,471	—	—	3,471
Balance at March 31, 2022	106,583	\$ 107	\$ 2,863,318	\$ 3,141,200	\$ (129,450)	\$ 5,875,175

See accompanying notes to these condensed consolidated financial statements.

FIRST SOLAR, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)
(Unaudited)

	Three Months Ended March 31,	
	2023	2022
Cash flows from operating activities:		
Net income (loss)	\$ 42,561	\$ (43,255)
Adjustments to reconcile net income (loss) to cash used in operating activities:		
Depreciation, amortization and accretion	68,855	65,207
Share-based compensation	6,600	3,503
Deferred income taxes	(55,282)	1,083
Gain on sales of businesses, net	17	(1,907)
Other, net	(698)	2,165
Changes in operating assets and liabilities:		
Accounts receivable, trade and unbilled	33,933	144,286
Inventories	(122,996)	(175,990)
Project assets and PV solar power systems	6,099	(98,695)
Government grants receivable	(70,114)	—
Other assets	(66,493)	(30,838)
Income tax receivable and payable	43,646	(23,502)
Accounts payable and accrued expenses	(61,552)	(38,043)
Deferred revenue	139,713	77,042
Other liabilities	1,113	(19,895)
Net cash used in operating activities	(34,598)	(138,839)
Cash flows from investing activities:		
Purchases of property, plant and equipment	(370,961)	(154,761)
Purchases of marketable securities and restricted marketable securities	(1,470,600)	(750,220)
Proceeds from maturities of marketable securities	1,196,334	900,165
Proceeds from sales of businesses	—	1,860
Other investing activities	—	12
Net cash used in investing activities	(645,227)	(2,944)
Cash flows from financing activities:		
Repayment of long-term debt	—	(737)
Proceeds from borrowings under long-term debt, net of issuance costs	136,000	18,006
Payments of tax withholdings for restricted shares	(28,314)	(11,505)
Net cash provided by financing activities	107,686	5,764
Effect of exchange rate changes on cash, cash equivalents, restricted cash, and restricted cash equivalents	1,495	15,162
Net decrease in cash, cash equivalents, restricted cash, and restricted cash equivalents	(570,644)	(120,857)
Cash, cash equivalents, restricted cash, and restricted cash equivalents, beginning of the period	1,493,462	1,455,837
Cash, cash equivalents, restricted cash, and restricted cash equivalents, end of the period	\$ 922,818	\$ 1,334,980
Supplemental disclosure of noncash investing and financing activities:		
Property, plant and equipment acquisitions funded by liabilities	\$ 330,830	\$ 105,643

See accompanying notes to these condensed consolidated financial statements.

FIRST SOLAR, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

1. Basis of Presentation

The accompanying unaudited condensed consolidated financial statements of First Solar, Inc. and its subsidiaries in this Quarterly Report have been prepared in accordance with generally accepted accounting principles in the United States of America (“U.S. GAAP”) for interim financial information and pursuant to the instructions to Form 10-Q and Article 10 of Regulation S-X of the Securities and Exchange Commission (the “SEC”). Accordingly, these interim financial statements do not include all of the information and footnotes required by U.S. GAAP for annual financial statements. In the opinion of First Solar management, all adjustments (consisting only of normal recurring adjustments) considered necessary for a fair statement have been included. Certain prior period balances have been reclassified to conform to the current period presentation.

The preparation of condensed consolidated financial statements in conformity with U.S. GAAP requires us to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Despite our intention to establish accurate estimates and reasonable assumptions, actual results could differ materially from such estimates and assumptions. Operating results for the three months ended March 31, 2023 are not necessarily indicative of the results that may be expected for the year ending December 31, 2023 or for any other period. The condensed consolidated balance sheet at December 31, 2022 has been derived from the audited consolidated financial statements at that date, but does not include all of the information and footnotes required by U.S. GAAP for complete financial statements. These interim financial statements and notes should be read in conjunction with the audited financial statements and notes thereto for the year ended December 31, 2022 included in our Annual Report on Form 10-K, which has been filed with the SEC.

Unless expressly stated or the context otherwise requires, the terms “the Company,” “we,” “us,” “our,” and “First Solar” refer to First Solar, Inc. and its consolidated subsidiaries, and the term “condensed consolidated financial statements” refers to the accompanying unaudited condensed consolidated financial statements contained in this Quarterly Report.

2. Sales of Businesses

Sales of International O&M Operations

In January 2022, we completed the sale of our Chilean operations and maintenance (“O&M”) operations to a subsidiary of Clairvest Group, Inc. (“Clairvest”) and received total consideration of \$1.9 million. As a result of this transaction, we recognized a gain of \$1.9 million, net of transaction costs and post-closing adjustments, during the three months ended March 31, 2022, which was included in “Gain on sales of businesses, net” in our condensed consolidated statements of operations.

During the three months ended March 31, 2023, we recognized certain post-closing adjustments associated with the prior sale of our O&M operations in a foreign jurisdiction, which was included in “Gain on sales of businesses, net” in our condensed consolidated statements of operations.

3. Cash, Cash Equivalents, and Marketable Securities

Cash, cash equivalents, and marketable securities consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Cash and cash equivalents:		
Cash	\$ 899,537	\$ 1,476,945
Money market funds	7,097	4,324
Total cash and cash equivalents	906,634	1,481,269
Marketable securities:		
Foreign debt	56,499	59,777
U.S. debt	56,731	56,463
U.S. Treasury securities	520,516	—
Time deposits	730,861	980,472
Total marketable securities	1,364,607	1,096,712
Total cash, cash equivalents, and marketable securities	\$ 2,271,241	\$ 2,577,981

The following table provides a reconciliation of cash, cash equivalents, restricted cash, and restricted cash equivalents reported within our condensed consolidated balance sheets as of March 31, 2023 and December 31, 2022 to the total of such amounts as presented in the condensed consolidated statements of cash flows (in thousands):

	Balance Sheet Line Item	March 31, 2023	December 31, 2022
Cash and cash equivalents	Cash and cash equivalents	\$ 906,634	\$ 1,481,269
Restricted cash – current	Other current assets	12,256	3,175
Restricted cash – noncurrent	Other assets	1,349	2,734
Restricted cash equivalents - noncurrent	Other assets	2,579	6,284
Total cash, cash equivalents, restricted cash, and restricted cash equivalents		\$ 922,818	\$ 1,493,462

See Note 9. “Fair Value Measurements” to our condensed consolidated financial statements for information about the fair value of our marketable securities.

The following tables summarize the unrealized gains and losses related to our available-for-sale marketable securities, by major security type, as of March 31, 2023 and December 31, 2022 (in thousands):

	As of March 31, 2023				
	Amortized Cost	Unrealized Gains	Unrealized Losses	Allowance for Credit Losses	Fair Value
Foreign debt	\$ 56,952	\$ —	\$ 430	\$ 23	\$ 56,499
U.S. debt	58,376	—	1,623	22	56,731
U.S. Treasury securities	520,705	—	189	—	520,516
Time deposits	731,114	—	—	253	730,861
Total	<u>\$ 1,367,147</u>	<u>\$ —</u>	<u>\$ 2,242</u>	<u>\$ 298</u>	<u>\$ 1,364,607</u>

	As of December 31, 2022				
	Amortized Cost	Unrealized Gains	Unrealized Losses	Allowance for Credit Losses	Fair Value
Foreign debt	\$ 59,940	\$ —	\$ 140	\$ 23	\$ 59,777
U.S. debt	58,308	—	1,823	22	56,463
Time deposits	980,810	—	—	338	980,472
Total	<u>\$ 1,099,058</u>	<u>\$ —</u>	<u>\$ 1,963</u>	<u>\$ 383</u>	<u>\$ 1,096,712</u>

The following table presents the change in the allowance for credit losses related to our available-for-sale marketable securities for the three months ended March 31, 2023 and 2022 (in thousands):

	Three Months Ended March 31,	
	2023	2022
Allowance for credit losses, beginning of period	\$ 383	\$ 97
Provision for credit losses, net	253	49
Sales and maturities of marketable securities	(338)	(86)
Allowance for credit losses, end of period	<u>\$ 298</u>	<u>\$ 60</u>

The contractual maturities of our marketable securities as of March 31, 2023 were as follows (in thousands):

	Fair Value
One year or less	\$ 1,259,325
One year to two years	69,886
Two years to three years	31,399
Three years to four years	—
Four years to five years	—
More than five years	3,997
Total	<u>\$ 1,364,607</u>

4. Restricted Marketable Securities

Restricted marketable securities consisted of the following as of March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Foreign government obligations	\$ 48,539	\$ 46,886
Supranational debt	15,614	8,661
U.S. debt	114,283	109,328
U.S. government obligations	18,155	17,195
Total restricted marketable securities	<u>\$ 196,591</u>	<u>\$ 182,070</u>

Our restricted marketable securities represent long-term investments to fund the estimated future cost of collecting and recycling modules covered under our solar module collection and recycling program. We have established a trust under which estimated funds are put into custodial accounts with an established and reputable bank, for which First Solar, Inc.; First Solar Malaysia Sdn. Bhd.; and First Solar Manufacturing GmbH are grantors. As of March 31, 2023 and December 31, 2022, such custodial accounts also included noncurrent restricted cash and cash equivalents balances of \$2.6 million and \$6.7 million, respectively, which were reported within “Other assets.” Trust funds may be disbursed for qualified module collection and recycling costs (including capital and facility related recycling costs), payments to customers for assuming collection and recycling obligations, and reimbursements of any overfunded amounts. Investments in the trust must meet certain investment quality criteria comparable to highly rated government or agency bonds. As necessary, we fund any incremental amounts for our estimated collection and recycling obligations on an annual basis based on the estimated costs of collecting and recycling covered modules, estimated rates of return on our restricted marketable securities, and an estimated solar module life of 25 years, less amounts already funded in prior years.

See Note 9. “Fair Value Measurements” to our condensed consolidated financial statements for information about the fair value of our restricted marketable securities.

The following tables summarize the unrealized gains and losses related to our restricted marketable securities, by major security type, as of March 31, 2023 and December 31, 2022 (in thousands):

	As of March 31, 2023				
	Amortized Cost	Unrealized Gains	Unrealized Losses	Allowance for Credit Losses	Fair Value
Foreign government obligations	\$ 64,647	\$ —	\$ 16,098	\$ 10	\$ 48,539
Supranational debt	17,851	—	2,237	—	15,614
U.S. debt	147,842	—	33,531	28	114,283
U.S. government obligations	24,529	—	6,369	5	18,155
Total	<u>\$ 254,869</u>	<u>\$ —</u>	<u>\$ 58,235</u>	<u>\$ 43</u>	<u>\$ 196,591</u>

	As of December 31, 2022				
	Amortized Cost	Unrealized Gains	Unrealized Losses	Allowance for Credit Losses	Fair Value
Foreign government obligations	\$ 64,008	\$ —	\$ 17,112	\$ 10	\$ 46,886
Supranational debt	11,146	—	2,485	—	8,661
U.S. debt	148,288	—	38,932	28	109,328
U.S. government obligations	24,551	—	7,352	4	17,195
Total	<u>\$ 247,993</u>	<u>\$ —</u>	<u>\$ 65,881</u>	<u>\$ 42</u>	<u>\$ 182,070</u>

The following table presents the change in the allowance for credit losses related to our restricted marketable securities for the three months ended March 31, 2023 and 2022 (in thousands):

	Three Months Ended March 31,	
	2023	2022
Allowance for credit losses, beginning of period	\$ 42	\$ 53
Provision for credit losses, net	1	(3)
Allowance for credit losses, end of period	<u>\$ 43</u>	<u>\$ 50</u>

As of March 31, 2023, the contractual maturities of our restricted marketable securities were between 8 years and 16 years.

5. Consolidated Balance Sheet Details

Accounts receivable trade, net

Accounts receivable trade, net consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Accounts receivable trade, gross	\$ 299,628	\$ 325,379
Allowance for credit losses	(1,008)	(1,042)
Accounts receivable trade, net	<u>\$ 298,620</u>	<u>\$ 324,337</u>

Allowance for credit losses

The following table presents the change in the allowance for credit losses related to our trade accounts receivable for the three months ended March 31, 2023 and 2022 (in thousands):

	Three Months Ended March 31,	
	2023	2022
Allowance for credit losses, beginning of period	\$ 1,042	\$ 664
Provision for credit losses, net	(34)	(185)
Allowance for credit losses, end of period	<u>\$ 1,008</u>	<u>\$ 479</u>

Inventories

Inventories consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Raw materials	\$ 403,225	\$ 397,912
Work in process	75,731	66,641
Finished goods	525,804	417,218
Inventories	<u>\$ 1,004,760</u>	<u>\$ 881,771</u>
Inventories – current	<u>\$ 751,407</u>	<u>\$ 621,376</u>
Inventories – noncurrent	<u>\$ 253,353</u>	<u>\$ 260,395</u>

Other current assets

Other current assets consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Spare maintenance materials and parts	\$ 120,542	\$ 114,428
Operating supplies	59,697	47,492
Prepaid expenses	45,470	43,262
Prepaid income taxes	12,325	8,314
Restricted cash	12,256	3,175
Derivative instruments (1)	2,690	2,018
Other	19,722	18,384
Other current assets	<u>\$ 272,702</u>	<u>\$ 237,073</u>

(1) See Note 7. “Derivative Financial Instruments” to our condensed consolidated financial statements for discussion of our derivative instruments.

Property, plant and equipment, net

Property, plant and equipment, net consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Land	\$ 35,305	\$ 35,259
Buildings and improvements	1,009,652	893,049
Machinery and equipment	2,803,499	2,762,801
Office equipment and furniture	155,321	146,467
Leasehold improvements	40,077	40,160
Construction in progress	1,343,541	1,121,938
Property, plant and equipment, gross	5,387,395	4,999,674
Accumulated depreciation	(1,528,791)	(1,462,772)
Property, plant and equipment, net	<u>\$ 3,858,604</u>	<u>\$ 3,536,902</u>

Depreciation of property, plant and equipment was \$65.9 million and \$58.6 million for the three months ended March 31, 2023 and 2022, respectively.

Goodwill

Goodwill for the relevant reporting unit consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	December 31, 2022	Acquisitions (Impairments)	March 31, 2023
Modules	\$ 407,827	\$ —	\$ 407,827
Accumulated impairment losses	(393,365)	—	(393,365)
Goodwill	<u>\$ 14,462</u>	<u>\$ —</u>	<u>\$ 14,462</u>

Intangible assets, net

Intangible assets, net consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023		
	Gross Amount	Accumulated Amortization	Net Amount
Developed technology	\$ 97,347	\$ (71,150)	\$ 26,197
Patents	8,970	(6,690)	2,280
Intangible assets, net	<u>\$ 106,317</u>	<u>\$ (77,840)</u>	<u>\$ 28,477</u>

	December 31, 2022		
	Gross Amount	Accumulated Amortization	Net Amount
Developed technology	\$ 97,347	\$ (68,650)	\$ 28,697
Patents	8,970	(6,561)	2,409
Intangible assets, net	<u>\$ 106,317</u>	<u>\$ (75,211)</u>	<u>\$ 31,106</u>

Amortization of intangible assets was \$2.6 million and \$2.7 million for the three months ended March 31, 2023 and 2022.

Other assets

Other assets consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Advance payments for raw materials	\$ 137,860	\$ 91,260
Operating lease assets (1)	91,282	93,185
Income tax receivables	56,993	56,993
Project assets	30,397	30,108
Accounts receivable unbilled, net	10,111	11,498
Restricted cash equivalents	2,579	6,284
Restricted cash	1,349	2,734
Accounts receivable trade, net	—	1,500
Other	56,149	62,630
Other assets	<u>\$ 386,720</u>	<u>\$ 356,192</u>

(1) See Note 8. “Leases” to our condensed consolidated financial statements for discussion of our lease arrangements.

Accrued expenses

Accrued expenses consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Accrued property, plant and equipment	\$ 193,399	\$ 148,777
Accrued freight	69,090	77,136
Accrued inventory	54,463	44,679
Accrued compensation and benefits	17,339	47,939
Accrued other taxes	12,862	19,765
Product warranty liability (1)	10,236	10,660
Other	34,523	33,826
Accrued expenses	<u>\$ 391,912</u>	<u>\$ 382,782</u>

(1) See Note 11. “Commitments and Contingencies” to our condensed consolidated financial statements for discussion of our “Product Warranties.”

Other current liabilities

Other current liabilities consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Operating lease liabilities (1)	\$ 9,363	\$ 9,193
Derivative instruments (2)	6,797	6,668
Other taxes payable	1,180	1,185
Other	3,291	4,199
Other current liabilities	<u>\$ 20,631</u>	<u>\$ 21,245</u>

(1) See Note 8. “Leases” to our condensed consolidated financial statements for discussion of our lease arrangements.

(2) See Note 7. “Derivative Financial Instruments” to our condensed consolidated financial statements for discussion of our derivative instruments.

Other liabilities

Other liabilities consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	December 31, 2022
Operating lease liabilities (1)	\$ 38,473	\$ 40,589
Deferred tax liabilities, net	32,500	28,929
Product warranty liability (2)	23,079	23,127
Other	27,320	27,292
Other liabilities	<u>\$ 121,372</u>	<u>\$ 119,937</u>

(1) See Note 8. “Leases” to our condensed consolidated financial statements for discussion of our lease arrangements.

(2) See Note 11. “Commitments and Contingencies” to our condensed consolidated financial statements for discussion of our “Product Warranties.”

6. Government Grants

Government grants represent benefits provided by federal, state, or local governments that are not subject to the scope of ASC 740. We recognize a grant when we have reasonable assurance that we will comply with the grant's conditions and that the grant will be received. Government grants whose primary condition is the purchase, construction, or acquisition of a long-lived asset are considered asset-based grants and are recognized as a reduction to such asset's cost-basis, which reduces future depreciation. Other government grants not related to long-lived assets are considered income-based grants, which are recognized as a reduction to the related cost of activities that generated the benefit.

The following table presents the benefits recognized from income-based government grants in our condensed consolidated statements of operations for the three months ended March 31, 2023 and 2022 (in thousands):

Income Statement Line Item	Three Months Ended March 31,	
	2023	2022
Cost of sales	\$ 70,114	\$ —

In August 2022, the U.S. President signed into law the Inflation Reduction Act of 2022 ("IRA"). Among other things, the IRA offers a tax credit, pursuant to Section 45X of the Internal Revenue Code ("IRC"), for solar modules and solar module components manufactured in the United States and sold to third parties. Such credit may be refundable or transferable to a third party and is available from 2023 to 2032, subject to phase down beginning in 2030. For eligible components, the credit is equal to (i) \$12 per square meter for a photovoltaic ("PV") wafer, (ii) 4 cents multiplied by the capacity of a PV cell, and (iii) 7 cents multiplied by the capacity of a PV module. Based on the current form factor of our modules, we expect to qualify for a credit of approximately 17 cents per watt for each module produced in the United States and sold to a third party. We recognize such credit as a reduction to "Cost of sales" in the period the modules are sold to customers. Such credit is also reflected on our condensed consolidated balance sheets within "Government grants receivable."

7. Derivative Financial Instruments

As a global company, we are exposed in the normal course of business to interest rate, foreign currency, and commodity price risks that could affect our financial position, results of operations, and cash flows. We use derivative instruments to hedge against these risks and only hold such instruments for hedging purposes, not for speculative or trading purposes.

Depending on the terms of the specific derivative instruments and market conditions, some of our derivative instruments may be assets and others liabilities at any particular balance sheet date. We report all of our derivative instruments at fair value and account for changes in the fair value of derivative instruments within "Accumulated other comprehensive loss" if the derivative instruments qualify for hedge accounting. For those derivative instruments that do not qualify for hedge accounting (i.e., "economic hedges"), we record the changes in fair value directly to earnings. See Note 9. "Fair Value Measurements" to our condensed consolidated financial statements for information about the techniques we use to measure the fair value of our derivative instruments.

The following tables present the fair values of derivative instruments included in our condensed consolidated balance sheets as of March 31, 2023 and December 31, 2022 (in thousands):

	March 31, 2023	
	Other Current Assets	Other Current Liabilities
Derivatives designated as hedging instruments:		
Commodity swap contracts	\$ —	\$ 2,323
Total derivatives designated as hedging instruments	\$ —	\$ 2,323
Derivatives not designated as hedging instruments:		
Foreign exchange forward contracts	\$ 2,690	\$ 4,474
Total derivatives not designated as hedging instruments	\$ 2,690	\$ 4,474
Total derivative instruments	\$ 2,690	\$ 6,797

	December 31, 2022			
	Other Current Assets	Other Assets	Other Current Liabilities	Other Liabilities
Derivatives designated as hedging instruments:				
Commodity swap contracts	\$ —	\$ 17	\$ 4,447	\$ 144
Total derivatives designated as hedging instruments	\$ —	\$ 17	\$ 4,447	\$ 144
Derivatives not designated as hedging instruments:				
Foreign exchange forward contracts	\$ 2,018	\$ —	\$ 2,221	\$ —
Total derivatives not designated as hedging instruments	\$ 2,018	\$ —	\$ 2,221	\$ —
Total derivative instruments	\$ 2,018	\$ 17	\$ 6,668	\$ 144

The following table presents the pretax amounts related to derivative instruments designated as cash flow hedges affecting accumulated other comprehensive income (loss) and our condensed consolidated statements of operations for the three months ended March 31, 2023 and 2022 (in thousands):

	Foreign Exchange Forward Contracts	Commodity Swap Contracts	Total
Balance as of December 31, 2022	\$ —	\$ (7,242)	\$ (7,242)
Amounts recognized in other comprehensive income (loss)	—	254	254
Amounts reclassified to earnings impacting:			
Cost of sales	—	2,668	2,668
Balance as of March 31, 2023	\$ —	\$ (4,320)	\$ (4,320)
Balance as of December 31, 2021	\$ 1,126	\$ —	\$ 1,126
Amounts recognized in other comprehensive income (loss)	426	(402)	24
Amounts reclassified to earnings impacting:			
Cost of sales	(560)	—	(560)
Balance as of March 31, 2022	\$ 992	\$ (402)	\$ 590

During the three months ended March 31, 2022, we recognized unrealized losses of less than \$0.1 million within “Cost of sales” for amounts excluded from effectiveness testing for our foreign exchange forward contracts designated as cash flow hedges.

The following table presents the pretax amounts related to derivative instruments designated as net investment hedges affecting accumulated other comprehensive income (loss) and our condensed consolidated statements of operations for the three months ended March 31, 2023 (in thousands):

	Foreign Exchange Forward Contracts
Balance as of December 31, 2022	\$ (667)
Amounts recognized in other comprehensive income (loss)	—
Balance as of March 31, 2023	\$ (667)

The following table presents gains and losses related to derivative instruments not designated as hedges affecting our condensed consolidated statements of operations for the three months ended March 31, 2023 and 2022 (in thousands):

		Amount of Gain (Loss) Recognized in Income	
		Three Months Ended March 31,	
	Income Statement Line Item	2023	2022
Foreign exchange forward contracts	Cost of sales	\$ —	\$ 78
Foreign exchange forward contracts	Foreign currency loss, net	(4,683)	18,981

Foreign Currency Risk

Cash Flow Exposure

We expect certain of our subsidiaries to have future cash flows that will be denominated in currencies other than the subsidiaries' functional currencies. Changes in the exchange rates between the functional currencies of our subsidiaries and the other currencies in which they transact will cause fluctuations in the cash flows we expect to receive or pay when these cash flows are realized or settled. Accordingly, we enter into foreign exchange forward contracts to hedge a portion of these forecasted cash flows. These foreign exchange forward contracts qualify for accounting as cash flow hedges in accordance with Accounting Standards Codification ("ASC") 815, and we designated them as such. We report unrealized gains or losses on such contracts in "Accumulated other comprehensive loss" and subsequently reclassify applicable amounts into earnings when the hedged transaction occurs and impacts earnings.

Net Investment Exposure

The functional currencies of certain of our foreign subsidiaries are their local currencies. Accordingly, we apply period-end exchange rates to translate their assets and liabilities and daily transaction exchange rates to translate their revenues, expenses, gains, and losses into U.S. dollars. We include the associated translation adjustments as a separate component of "Accumulated other comprehensive loss" within stockholders' equity. From time to time, we may seek to mitigate the impact of such translation adjustments by entering into foreign exchange forward contracts that are designated as hedges of net investments in certain foreign subsidiaries. In June 2022, we entered into a foreign exchange forward contract with a notional value of ¥8.0 billion (\$60.6 million), which matured in December 2022. Such foreign exchange forward contract qualified for and was designated as a hedge of our net investment in a certain foreign subsidiary in Japan. We report unrealized gains or losses on this contract, which are based on spot exchange rates, as a component of our foreign currency translation adjustments within "Accumulated other comprehensive loss" and subsequently reclassify applicable amounts into earnings when the net investments are sold or substantially liquidated.

Transaction Exposure and Economic Hedging

Many of our subsidiaries have assets and liabilities (primarily cash, receivables, deferred taxes, payables, accrued expenses, operating lease liabilities, long-term debt, and solar module collection and recycling liabilities) that are denominated in currencies other than the subsidiaries' functional currencies. Changes in the exchange rates between the functional currencies of our subsidiaries and the other currencies in which these assets and liabilities are denominated will create fluctuations in our reported condensed consolidated statements of operations and cash flows. We may enter into foreign exchange forward contracts or other financial instruments to economically hedge assets and liabilities against the effects of currency exchange rate fluctuations. The gains and losses on such foreign exchange forward contracts will economically offset all or part of the transaction gains and losses that we recognize in earnings on the related foreign currency denominated assets and liabilities.

We also enter into foreign exchange forward contracts to economically hedge balance sheet and other exposures related to transactions between certain of our subsidiaries and transactions with third parties. Such contracts are considered economic hedges and do not qualify for hedge accounting. Accordingly, we recognize gains or losses from the fluctuations in foreign exchange rates and the fair value of these derivative contracts in "Foreign currency loss, net" on our condensed consolidated statements of operations.

As of March 31, 2023 and December 31, 2022, the notional values of our foreign exchange forward contracts that do not qualify for hedge accounting were as follows (notional amounts and U.S. dollar equivalents in millions):

Transaction	Currency	March 31, 2023	
		Notional Amount	USD Equivalent
Sell	Canadian dollar	CAD 4.2	\$3.1
Sell	Chilean peso	CLP 1,979.6	\$2.5
Purchase	Euro	€96.4	\$104.5
Sell	Euro	€28.8	\$31.2
Purchase	Indian rupee	INR 12,009.8	\$146.0
Sell	Indian rupee	INR 26,911.9	\$327.1
Purchase	Japanese yen	¥2,151.6	\$16.3
Sell	Japanese yen	¥1,971.1	\$14.9
Purchase	Malaysian ringgit	MYR 113.3	\$25.7
Sell	Malaysian ringgit	MYR 35.0	\$7.9
Sell	Mexican peso	MXN 34.6	\$1.9
Purchase	Singapore dollar	SGD 21.4	\$16.1

Transaction	Currency	December 31, 2022	
		Notional Amount	USD Equivalent
Sell	Canadian dollar	CAD 4.2	\$3.1
Sell	Chilean peso	CLP 5,996.5	\$7.0
Purchase	Euro	€160.2	\$170.5
Sell	Euro	€38.4	\$40.9
Sell	Indian rupee	INR 27,119.5	\$327.4
Purchase	Japanese yen	¥2,982.7	\$22.4
Sell	Japanese yen	¥8,950.3	\$67.1
Purchase	Malaysian ringgit	MYR 99.8	\$22.6
Sell	Malaysian ringgit	MYR 13.7	\$3.1
Sell	Mexican peso	MXN 34.6	\$1.8
Purchase	Singapore dollar	SGD 1.4	\$1.0

Commodity Price Risk

We use commodity swap contracts to mitigate our exposure to commodity price fluctuations for certain raw materials used in the production of our modules. During the year ended December 31, 2022, we entered into various commodity swap contracts to hedge a portion of our forecasted cash flows for purchases of aluminum frames between July 2022 and December 2023. Such swaps had an aggregate initial notional value based on metric tons of forecasted aluminum purchases, equivalent to \$70.5 million, and entitle us to receive a three-month average London Metals Exchange price for aluminum while requiring us to pay certain fixed prices. The notional amount of the commodity swap contracts proportionately adjusts with forecasted purchases of aluminum frames. As of March 31, 2023, the notional value associated with these contracts was \$18.6 million.

These commodity swap contracts qualify for accounting as cash flow hedges in accordance with ASC 815, and we designated them as such. We report unrealized gains or losses on such contracts in “Accumulated other comprehensive loss” and subsequently reclassify applicable amounts into earnings when the hedged transactions occur and impact earnings. We determined that these derivative financial instruments were highly effective as cash flow hedges as of March 31, 2023 and December 31, 2022. In the following 12 months, we expect to reclassify into earnings \$4.2 million of net unrealized losses related to these commodity swap contracts that are included in “Accumulated other comprehensive loss” at March 31, 2023 as we realize the earnings effects of the related forecasted transactions. The amount we ultimately record to earnings will depend on the actual commodity pricing when we realize the related forecasted transactions.

8. Leases

Our lease arrangements include land associated with our corporate and administrative offices, land for our international manufacturing facilities, and certain of our manufacturing equipment. Such leases primarily relate to assets located in the United States, Malaysia, India, and Vietnam.

The following table presents certain quantitative information related to our lease arrangements for the three months ended March 31, 2023 and 2022, and as of March 31, 2023 and December 31, 2022 (in thousands):

	Three Months Ended March 31,	
	2023	2022
Operating lease cost	\$ 2,937	\$ 4,377
Variable lease cost	895	599
Short-term lease cost	70	31
Total lease cost	<u>\$ 3,902</u>	<u>\$ 5,007</u>
Payments of amounts included in the measurement of operating lease liabilities	\$ 2,753	\$ 4,136
Lease assets obtained in exchange for operating lease liabilities	\$ 251	\$ 534
	March 31, 2023	December 31, 2022
Operating lease assets	\$ 91,282	\$ 93,185
Operating lease liabilities – current	9,363	9,193
Operating lease liabilities – noncurrent	38,473	40,589
Weighted-average remaining lease term	5 years	6 years
Weighted-average discount rate	5.1 %	5.1 %

As of March 31, 2023, the future payments associated with our lease liabilities were as follows (in thousands):

	Total Lease Liabilities
Remainder of 2023	\$ 8,558
2024	10,999
2025	9,899
2026	8,367
2027	5,777
2028	5,900
Thereafter	5,490
Total future payments	54,990
Less: interest	(7,154)
Total lease liabilities	\$ 47,836

9. Fair Value Measurements

The following is a description of the valuation techniques that we use to measure the fair value of assets and liabilities that we measure and report at fair value on a recurring basis:

- *Cash Equivalents and Restricted Cash Equivalents.* At March 31, 2023 and December 31, 2022, our cash equivalents and restricted cash equivalents consisted of money market funds. We value our cash equivalents and restricted cash equivalents using observable inputs that reflect quoted prices for securities with identical characteristics and classify the valuation techniques that use these inputs as Level 1.
- *Marketable Securities and Restricted Marketable Securities.* At March 31, 2023 and December 31, 2022, our marketable securities consisted of foreign debt, U.S. debt, U.S. Treasury securities, and time deposits, and our restricted marketable securities consisted of foreign and U.S. government obligations, supranational debt, and U.S. debt. We value our marketable securities and restricted marketable securities using observable inputs that reflect quoted prices for securities with identical characteristics or quoted prices for securities with similar characteristics and other observable inputs (such as interest rates that are observable at commonly quoted intervals). Accordingly, we classify the valuation techniques that use these inputs as either Level 1 or Level 2 depending on the inputs used. We also consider the effect of our counterparties' credit standing in these fair value measurements.
- *Derivative Assets and Liabilities.* At March 31, 2023 and December 31, 2022, our derivative assets and liabilities consisted of foreign exchange forward contracts involving major currencies and commodity swap contracts involving major commodity prices. Since our derivative assets and liabilities are not traded on an exchange, we value them using standard industry valuation models. As applicable, these models project future cash flows and discount the amounts to a present value using market-based observable inputs, including credit risk, foreign exchange rates, forward and spot prices for currencies, and forward prices for commodities. These inputs are observable in active markets over the contract term of the derivative instruments we hold, and accordingly, we classify the valuation techniques as Level 2. In evaluating credit risk, we consider the effect of our counterparties' and our own credit standing in the fair value measurements of our derivative assets and liabilities, respectively.

At March 31, 2023 and December 31, 2022, the fair value measurements of our assets and liabilities measured on a recurring basis were as follows (in thousands):

		Fair Value Measurements at Reporting Date Using		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
	March 31, 2023			
Assets:				
Cash equivalents:				
Money market funds	\$ 7,097	\$ 7,097	\$ —	\$ —
Restricted cash equivalents:				
Money market funds	2,579	2,579	—	—
Marketable securities:				
Foreign debt	56,499	—	56,499	—
U.S. debt	56,731	—	56,731	—
U.S. Treasury securities	520,516	520,516	—	—
Time deposits	730,861	730,861	—	—
Restricted marketable securities	196,591	—	196,591	—
Derivative assets	2,690	—	2,690	—
Total assets	<u>\$ 1,573,564</u>	<u>\$ 1,261,053</u>	<u>\$ 312,511</u>	<u>\$ —</u>
Liabilities:				
Derivative liabilities	<u>\$ 6,797</u>	<u>\$ —</u>	<u>\$ 6,797</u>	<u>\$ —</u>

		Fair Value Measurements at Reporting Date Using		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
	December 31, 2022			
Assets:				
Cash equivalents:				
Money market funds	\$ 4,324	\$ 4,324	\$ —	\$ —
Restricted cash equivalents:				
Money market funds	6,284	6,284	—	—
Marketable securities:				
Foreign debt	59,777	—	59,777	—
U.S. debt	56,463	—	56,463	—
Time deposits	980,472	980,472	—	—
Restricted marketable securities	182,070	—	182,070	—
Derivative assets	2,035	—	2,035	—
Total assets	<u>\$ 1,291,425</u>	<u>\$ 991,080</u>	<u>\$ 300,345</u>	<u>\$ —</u>
Liabilities:				
Derivative liabilities	<u>\$ 6,812</u>	<u>\$ —</u>	<u>\$ 6,812</u>	<u>\$ —</u>

Fair Value of Financial Instruments

At March 31, 2023 and December 31, 2022, the carrying values and fair values of our financial instruments not measured at fair value were as follows (in thousands):

	March 31, 2023		December 31, 2022	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Assets:				
Government grants receivable - noncurrent	\$ 70,114	\$ 69,243	\$ —	\$ —
Accounts receivable unbilled, net - noncurrent	10,111	9,178	11,498	10,304
Accounts receivable trade, net - noncurrent	—	—	1,500	1,339
Liabilities:				
Long-term debt (1)	\$ 321,000	\$ 283,996	\$ 185,000	\$ 160,986

(1) Excludes unamortized issuance costs.

The carrying values in our condensed consolidated balance sheets of our current trade accounts receivable, current unbilled accounts receivable, restricted cash, accounts payable, and accrued expenses approximated their fair values due to their nature and relatively short maturities; therefore, we excluded them from the foregoing table. The fair value measurements for our noncurrent unbilled accounts receivable, noncurrent trade accounts receivable, government grants receivable, and long-term debt are considered Level 2 measurements under the fair value hierarchy.

Credit Risk

We have certain financial and derivative instruments that subject us to credit risk. These consist primarily of cash, cash equivalents, marketable securities, accounts receivable, restricted cash, restricted cash equivalents, restricted marketable securities, foreign exchange forward contracts, and commodity swap contracts. We are exposed to credit losses in the event of nonperformance by the counterparties to our financial and derivative instruments. We place these instruments with various high-quality financial institutions and limit the amount of credit risk from any one counterparty. We monitor the credit standing of our counterparty financial institutions. Our net sales are primarily concentrated among a limited number of customers. We monitor the financial condition of our customers and perform credit evaluations whenever considered necessary. We typically require some form of payment security from our customers, including, but not limited to, advance payments, parent guarantees, letters of credit, bank guarantees, or surety bonds.

10. Debt

Our long-term debt consisted of the following at March 31, 2023 and December 31, 2022 (in thousands):

Loan Agreement	Currency	Balance (USD)	
		March 31, 2023	December 31, 2022
India Credit Facility	USD	\$ 321,000	\$ 185,000
Less: unamortized issuance costs		(622)	(651)
Total long-term debt		<u>\$ 320,378</u>	<u>\$ 184,349</u>

India Credit Facility

In July 2022, FS India Solar Ventures Private Limited, our indirect wholly-owned subsidiary, entered into a finance agreement (the “India Credit Facility”) with the U.S. International Development Finance Corporation (“DFC”) for aggregate borrowings up to \$500.0 million for the development and construction of an approximately 3.3 GW_{DC} solar module manufacturing facility in India. Principal on the India Credit Facility is payable in scheduled semi-annual installments through the facility’s expected maturity in August 2029. The India Credit Facility is guaranteed by First Solar, Inc.

Interest Rate Risk

As of March 31, 2023, our long-term debt borrowing rates were as follows:

Loan Agreement	Interest Rate	Effective Interest Rate
India Credit Facility	U.S. Treasury Constant Maturity Yield plus 1.75%	5.36%

Future Principal Payments

At March 31, 2023, the future principal payments on our long-term debt were due as follows (in thousands):

	Total Debt
Remainder of 2023	\$ —
2024	22,759
2025	58,358
2026	58,358
2027	58,390
2028	58,422
Thereafter	64,713
Total long-term debt future principal payments	<u>\$ 321,000</u>

11. Commitments and Contingencies

Commercial Commitments

During the normal course of business, we enter into commercial commitments in the form of letters of credit and surety bonds to provide financial and performance assurance to third parties. As of March 31, 2023, the majority of these commercial commitments supported our modules business.

As of March 31, 2023, the issued and outstanding amounts and available capacities under these commitments were as follows (in millions):

	Issued and Outstanding	Available Capacity
Bilateral facilities (1)	\$ 119.3	\$ 126.1
Surety bonds	8.7	233.1

(1) Of the total letters of credit issued under the bilateral facilities, \$13.0 million was secured with cash.

Product Warranties

When we recognize revenue for sales of modules or projects, we accrue liabilities for the estimated future costs of meeting our limited warranty obligations for both modules and the balance of the systems. We estimate our limited product warranty liability for power output and defects in materials and workmanship under normal use and service conditions based on return rates for each series of module technology. We make and revise these estimates based primarily on the number of solar modules under warranty installed at customer locations, our historical experience with and projections of warranty claims, and our estimated per-module replacement costs. We also monitor our expected future module performance through certain quality and reliability testing and actual performance in certain field installation sites. From time to time, we have taken remediation actions with respect to affected modules beyond our limited warranties and may elect to do so in the future, in which case we would incur additional expenses. Such potential voluntary future remediation actions beyond our limited warranty obligations may be material to our condensed consolidated statements of operations if we commit to any such remediation actions.

Product warranty activities during the three months ended March 31, 2023 and 2022 were as follows (in thousands):

	Three Months Ended March 31,	
	2023	2022
Product warranty liability, beginning of period	\$ 33,787	\$ 52,553
Accruals for new warranties issued	994	848
Settlements	(1,326)	(6,002)
Changes in estimate of product warranty liability	(140)	(383)
Product warranty liability, end of period	\$ 33,315	\$ 47,016
Current portion of warranty liability	\$ 10,236	\$ 11,809
Noncurrent portion of warranty liability	\$ 23,079	\$ 35,207

Indemnifications

In certain limited circumstances, we have provided indemnifications to customers or other parties under which we are contractually obligated to compensate such parties for losses they suffer resulting from a breach of a representation, warranty, or covenant; the resolution of specific matters associated with a project's development or construction; or guarantees of a third party's payment or performance obligations. For contracts that have such indemnification provisions, we initially recognize a liability under ASC 460 for the estimated premium that would be required by a guarantor to issue the same indemnity in a standalone arm's-length transaction with an unrelated party. We may base these estimates on the cost of insurance or other instruments that cover the underlying risks being indemnified and may purchase such instruments to mitigate our exposure to potential indemnification payments. We subsequently measure such liabilities at the greater of the initially estimated premium or the contingent liability required to be recognized under ASC 450. We recognize any indemnification liabilities as a reduction of earnings associated with the related transaction.

After an indemnification liability is recorded, we derecognize such amount pursuant to ASC 460 depending on the nature of the indemnity, which derecognition typically occurs upon expiration or settlement of the arrangement, and any contingent aspects of the indemnity are accounted for in accordance with ASC 450. As of March 31, 2023 and December 31, 2022, we accrued \$2.5 million of current indemnification liabilities. As of March 31, 2023, the maximum potential amount of future payments under our indemnifications was \$53.8 million, and we held insurance and other instruments allowing us to recover up to \$27.3 million of potential amounts paid under the indemnifications.

Solar Module Collection and Recycling Liability

We previously established a module collection and recycling program, which has since been discontinued, to collect and recycle modules sold and covered under such program once the modules reach the end of their service lives. For legacy customer sales contracts that are covered under this program, we agreed to pay the costs for the collection and recycling of qualifying solar modules, and the end-users agreed to notify us, disassemble their solar power systems, package the solar modules for shipment, and revert ownership rights over the modules back to us at the end of the modules' service lives. Accordingly, we recorded any collection and recycling obligations within "Cost of sales" at the time of sale based on the estimated cost to collect and recycle the covered solar modules.

We estimate the cost of our collection and recycling obligations based on the present value of the expected future cost of collecting and recycling the solar modules, which includes estimates for the cost of packaging materials; the cost of freight from the solar module installation sites to a recycling center; material, labor, and capital costs; and by-product credits for certain materials recovered during the recycling process. We base these estimates on our experience collecting and recycling solar modules and certain assumptions regarding costs at the time the solar modules will be collected and recycled. In the periods between the time of sale and the related settlement of the collection and recycling obligation, we accrete the carrying amount of the associated liability and classify the corresponding expense within "Selling, general and administrative" expense on our condensed consolidated statements of operations.

Our module collection and recycling liability was \$130.3 million and \$128.1 million as of March 31, 2023 and December 31, 2022, respectively. See Note 4. "Restricted Marketable Securities" to our condensed consolidated financial statements for more information about our arrangements for funding this liability.

Legal Proceedings

Class Action

On January 7, 2022, a putative class action lawsuit titled *City of Pontiac General Employees' Retirement System v. First Solar, Inc., et al.*, Case No. 2:22-cv-00036-MTL, was filed in the United States District Court for the District of Arizona (hereafter "Arizona District Court") against the Company and certain of our current officers (collectively, "Putative Class Action Defendants"). The complaint was filed on behalf of a purported class consisting of all purchasers of First Solar common stock between February 22, 2019 and February 20, 2020, inclusive. The complaint asserts violations of Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 and Rule 10b-5 based on allegedly false and misleading statements related to the Company's Series 6 solar modules and its project development business. It seeks unspecified damages and an award of costs and expenses. On April 25, 2022, the Arizona District Court issued an order appointing the Palm Harbor Special Fire Control & Rescue District Firefighters' Pension Plan and the Greater Pennsylvania Carpenters' Pension Fund as Lead Plaintiffs. On June 23, 2022, Lead Plaintiffs filed an Amended Complaint that brings the same claims and seeks the same relief as the original complaint. On January 10, 2023, the Court granted the Putative Class Action Defendants' motion to dismiss in full, with leave to amend by February 10, 2023. On February 10, 2023, Lead Plaintiffs filed a Second Amended Complaint. Putative Class Action Defendants filed a motion to dismiss the Second Amended Complaint on February 24, 2023. Lead Plaintiffs filed their opposition to the motion to dismiss on March 10, 2023, and Putative Class Action Defendants filed a reply in support of their motion to dismiss on March 17, 2023. Given the early stage of the litigation, at this time we are not in a position to assess the likelihood of any potential loss or adverse effect on our financial condition or to estimate the amount or range of possible loss, if any, from this action.

Derivative Action

On September 13, 2022, a derivative action titled *Federman v. Widmar, et al.*, Case No. 2:22-cv-01541-JAT, was filed by a putative stockholder purportedly on behalf of the Company in the Arizona District Court against our current directors and certain officers of the Company (collectively, "Derivative Action Defendants"), alleging violations of Section 14(a) of the Securities Exchange Act of 1934, breach of fiduciary duties, contribution and indemnification, aiding and abetting, and gross mismanagement. The complaint generally alleges that the Derivative Action Defendants caused or allowed false and misleading statements to be made concerning the Company's Series 6 modules and project development business. The action includes claims for, among other things, damages in favor of the Company and an award of costs and expenses to the putative plaintiff stockholder, including attorneys' fees. The Company believes that the plaintiff in the derivative action lacks standing to pursue litigation on behalf of First Solar. On February 17, 2023, the case was transferred to Judge Liburdi, who is also presiding over the related putative class action. On March 10, 2023, the plaintiff filed an Amended Complaint. On April 10, 2023, the Derivative Action Defendants filed a motion to dismiss the Amended Complaint. The plaintiff's deadline to oppose the Derivative Action Defendants' motion to dismiss is May 18, 2023. Given the early stage of the litigation, at this time we are not in a position to assess the likelihood of any potential loss or adverse effect on our financial condition or to estimate the amount or range of possible loss, if any, from this action.

Other Matters and Claims

On July 12, 2021, Southern Power Company and certain of its affiliates ("Southern") filed an arbitration demand with the American Arbitration Association against two subsidiaries of the Company, alleging breach of the engineering, procurement, and construction ("EPC") agreements for five projects in the United States, for which the Company's subsidiaries served as EPC contractor. The arbitration demand asserts breach of obligations to design and engineer the projects in accordance with the EPC agreements, particularly as such obligations relate to the procurement of tracker systems and inverters. The Company and its subsidiaries deny the claims, and defended the claims in arbitration hearings, which concluded in late February 2023. At this time, the Company believes that Southern is seeking damages of approximately \$60 million. The parties are in the process of submitting post-hearing briefs and proposals, which are due in early May 2023. The arbitration panel will choose from the parties' proposals.

by issuing an award later this year. At this time, given the inherent risks and uncertainties involved in arbitration, we believe the likelihood of a potential loss is reasonably possible, but we are unable to estimate the amount or range of potential loss, if any, from this arbitration.

During the year ended December 31, 2022, we received several indemnification demands from certain customers, for whom we provided EPC services, regarding claims that such customers' PV tracker systems infringe, in part, on patents owned by Rovshan Sade ("Sade"), the owner of a company called Trabant Solar, Inc. In January 2023, we were notified by two of our customers that Sade served them with patent infringement complaints, and we have assumed the defense of these claims. We have conducted due diligence on the patents and claims and believe that we will prevail in the actions. Additionally, we anticipate the commencement of an Inter Partes Review before the United States Patent and Trademark Office seeking to invalidate such claims. Given the early stage of the litigation, at this time we are not in a position to assess the likelihood of any potential loss or adverse effect on our financial condition or to estimate the amount or range of possible loss, if any, from these actions.

We are party to other legal matters and claims in the normal course of our operations. While we believe the ultimate outcome of these matters and claims will not have a material adverse effect on our financial position, results of operations, or cash flows, the outcome of such matters and claims is not determinable with certainty, and negative outcomes may adversely affect us. There have been no material changes to these matters since our Annual Report on Form 10-K for the year ended December 31, 2022 was filed with the SEC on February 28, 2023.

12. Revenue from Contracts with Customers

The following table presents the disaggregation of revenue from contracts with customers for the three months ended March 31, 2023 and 2022 along with the reportable segment for each category (in thousands):

Category	Segment	Three Months Ended March 31,	
		2023	2022
Solar modules	Modules	\$ 536,590	\$ 354,881
Solar power systems	Other	11,261	1,969
O&M services	Other	452	3,897
Energy generation	Other	(17)	6,293
Net sales		<u>\$ 548,286</u>	<u>\$ 367,040</u>

We recognize revenue for module sales at a point in time following the transfer of control of the modules to the customer, which typically occurs upon shipment or delivery depending on the terms of the underlying contracts. Such contracts may contain provisions that require us to make liquidated damage payments to the customer if we fail to ship or deliver modules by scheduled dates. We recognize these liquidated damages as a reduction of revenue in the period we transfer control of the modules to the customer.

We recognize revenue for sales of development projects or completed systems when we enter into the associated sales contract. For certain prior project sales, such revenue included estimated amounts of variable consideration. These estimates may require significant judgment to determine the most likely amount of net contract revenues. The cumulative effect of revisions to estimates is recorded in the period in which the revisions are identified and the amounts can be reasonably estimated. During the three months ended March 31, 2023, revenue increased \$5.4 million due to net changes in transaction prices for four projects, which represented 23.8% of the aggregate revenue for such projects.

The following table reflects the changes in our contract assets, which we classify as “Accounts receivable unbilled, net” and our contract liabilities, which we classify as “Deferred revenue,” for the three months ended March 31, 2023 (in thousands):

	March 31, 2023	December 31, 2022	Three Month Change	
Accounts receivable unbilled, net (1)	\$ 36,005	\$ 42,152	\$ (6,147)	(15)%
Deferred revenue	\$ 1,348,381	\$ 1,207,940	\$ 140,441	12 %

(1) Includes \$10.1 million and \$11.5 million of noncurrent accounts receivable unbilled, net classified as “Other assets” on our condensed consolidated balance sheets as of March 31, 2023 and December 31, 2022, respectively.

During the three months ended March 31, 2023, our contract assets decreased by \$6.1 million primarily due to billings for a certain prior project sale, offset by unbilled receivables associated with variable consideration recognized for the sale of certain development projects in a prior period. During the three months ended March 31, 2023, our contract liabilities increased by \$140.4 million primarily due to advance payments received for sales of solar modules in the current period, partially offset by the recognition of revenue for sales of solar modules for which payment was received in prior years. During the three months ended March 31, 2023 and 2022, we recognized revenue of \$90.4 million and \$43.7 million, respectively, that was included in the corresponding contract liability balance at the beginning of the periods.

As of March 31, 2023, we had entered into contracts with customers for the future sale of 69.4 GW_{DC} of solar modules for an aggregate transaction price of \$20.4 billion, which we expect to recognize as revenue through 2029 as we transfer control of the modules to the customers. Such aggregate transaction price excludes estimates of variable consideration associated with (i) future module technology improvements, including new product designs and enhancements to certain energy related attributes, (ii) the extension of the investment tax credit (“ITC”), (iii) sales freight in excess of a defined threshold, (iv) changes to certain commodity prices, and (v) the module wattage committed for delivery, among other things. As a result, the revenue recognized from such contracts may increase or decrease in future periods relative to the original transaction price. These contracts may also be subject to amendments made by us or requested by our customers and approved by us. These amendments may increase or decrease the volume of modules to be sold under the contract, change delivery schedules, or otherwise adjust the expected revenue under these contracts.

13. Share-Based Compensation

The following table presents share-based compensation expense recognized in our condensed consolidated statements of operations for the three months ended March 31, 2023 and 2022 (in thousands):

	Three Months Ended March 31,	
	2023	2022
Cost of sales	\$ 926	\$ 498
Selling, general and administrative	4,782	2,574
Research and development	877	431
Production start-up	15	—
Total share-based compensation expense	<u>\$ 6,600</u>	<u>\$ 3,503</u>

As of March 31, 2023, we had \$53.8 million of unrecognized share-based compensation expense related to unvested restricted stock and performance units, which we expect to recognize over a weighted-average period of approximately 1.8 years.

In March 2020, the compensation committee of our board of directors approved grants of performance units for key executive officers to be earned over a multi-year performance period, which ended in December 2022. Vesting of the 2020 grants of performance units was contingent upon the relative attainment of target contracted revenue, module wattage, and return on capital metrics. In March 2023, the compensation committee certified the achievement of the vesting conditions applicable to the grants, which approximated the target level of performance. Accordingly, each participant received one share of common stock for each vested performance unit granted, net of any tax withholdings.

In May 2021, the compensation committee approved additional grants of performance units for key executive officers. Such grants are expected to be earned over a multi-year performance period ending in December 2023. Vesting of the 2021 grants of performance units is contingent upon the relative attainment of target contracted revenue, cost per watt, incremental average selling price, and operating income metrics.

In March 2022, the compensation committee approved additional grants of performance units for key executive officers. Such grants are expected to be earned over a multi-year performance period ending in December 2024. Vesting of the 2022 grants of performance units is contingent upon the relative attainment of target contracted revenue, cost per watt, and return on capital metrics.

In March 2023, the compensation committee approved additional grants of performance units for key executive officers. Such grants are expected to be earned over a multi-year performance period ending in December 2025. Vesting of the 2023 grants of performance units is contingent upon the relative attainment of target contracted revenue, production, and operating margin metrics.

Vesting of performance units is also contingent upon the employment of program participants through the applicable vesting dates, with limited exceptions in case of death, disability, a qualifying retirement, or a change-in-control of First Solar. Outstanding performance units are included in the computation of diluted net income per share based on the number of shares that would be issuable if the end of the reporting period were the end of the contingency period.

14. Income Taxes

In August 2022, the U.S. President signed into law the IRA, which revised U.S. tax law by, among other things, including a new corporate alternative minimum tax of 15% on certain large corporations, imposing a 1% excise tax on stock buybacks, and providing various incentives to address climate change, including the introduction of the advanced manufacturing production credit. The provisions of the IRA are generally effective for tax years beginning after 2022. Given the complexities of the IRA, which is pending technical guidance and regulations from the Internal Revenue Service (“IRS”) and U.S. Treasury Department, we will continue to monitor these developments and evaluate the potential future impact to our results of operations.

In November 2022, the U.S. Treasury Department released proposed foreign tax credit (“FTC”) regulations addressing various aspects of the U.S. FTC regime. Among other items, these proposed regulations provide certain exceptions for determining creditable foreign withholding taxes. Taxpayers may rely on these proposed regulations, which apply to tax years beginning on or after December 28, 2021. As a result of these proposed regulations, foreign withholding taxes will continue to be creditable.

Our effective tax rate was (19.3)% and 31.1% for the three months ended March 31, 2023 and 2022, respectively. The decrease in our effective tax rate was primarily driven by higher excess tax benefits associated with share-based compensation and the effect of the advanced manufacturing production credit described in Note 6. “Government Grants” to our condensed consolidated financial statements. Our provision for income taxes differed from the amount computed by applying the U.S. statutory federal income tax rate of 21% primarily due to excess tax benefits associated with share-based compensation and the effect of tax law changes associated with the IRA described above, partially offset by losses in certain jurisdictions for which no tax benefit could be recorded.

Our Malaysian subsidiary has been granted a long-term tax holiday that expires in 2027. The tax holiday, which generally provides for a full exemption from Malaysian income tax, is conditional upon our continued compliance with certain employment and investment thresholds, which we are currently in compliance with and expect to continue to comply with through the expiration of the tax holiday in 2027.

Our Vietnamese subsidiary had previously been granted a tax incentive that provided a two-year tax exemption, which began in 2020, and reduced annual tax rates through the end of 2025. In May 2022, our Vietnamese subsidiary was granted a new long-term tax incentive that provides an additional two-year tax exemption through 2023, followed by reduced annual tax rates of 5% through 2032 and 10% through 2036. Such long-term tax incentive is conditional upon our continued compliance with certain revenue and research and development (“R&D”) spending thresholds, which we are currently in compliance with and expect to continue to comply with through the expiration of the tax holiday.

We are subject to audit by federal, state, local, and foreign tax authorities. We are currently under examination in India, Chile, Singapore, and the state of California. We believe that adequate provisions have been made for any adjustments that may result from tax examinations. However, the outcome of tax examinations cannot be predicted with certainty. If any issues addressed by our tax examinations are not resolved in a manner consistent with our expectations, we could be required to adjust our provision for income taxes in the period such resolution occurs.

15. Net Income (Loss) per Share

The calculation of basic and diluted net income (loss) per share for the three months ended March 31, 2023 and 2022 was as follows (in thousands, except per share amounts):

	Three Months Ended March 31,	
	2023	2022
Basic net income (loss) per share		
Numerator:		
Net income (loss)	\$ 42,561	\$ (43,255)
Denominator:		
Weighted-average common shares outstanding	106,675	106,412
Diluted net income (loss) per share		
Denominator:		
Weighted-average common shares outstanding	106,675	106,412
Effect of restricted stock and performance units	479	—
Weighted-average shares used in computing diluted net income (loss) per share	107,154	106,412
Net income (loss) per share:		
Basic	\$ 0.40	\$ (0.41)
Diluted	\$ 0.40	\$ (0.41)

The following table summarizes the potential shares of common stock that were excluded from the computation of diluted net income (loss) per share for the three months ended March 31, 2023 and 2022 as such shares would have had an anti-dilutive effect (in thousands):

	Three Months Ended March 31,	
	2023	2022
Anti-dilutive shares	11	504

16. Accumulated Other Comprehensive Loss

The following table presents the changes in accumulated other comprehensive loss, net of tax, for the three months ended March 31, 2023 (in thousands):

	Foreign Currency Translation Adjustment	Unrealized (Loss) Gain on Marketable Securities and Restricted Marketable Securities	Unrealized (Loss) Gain on Derivative Instruments	Total
Balance as of December 31, 2022	\$ (121,473)	\$ (64,780)	\$ (5,564)	\$ (191,817)
Other comprehensive income before reclassifications	2,791	7,368	254	10,413
Amounts reclassified from accumulated other comprehensive loss	(136)	—	2,668	2,532
Net tax effect	—	(402)	(708)	(1,110)
Net other comprehensive income	2,655	6,966	2,214	11,835
Balance as of March 31, 2023	\$ (118,818)	\$ (57,814)	\$ (3,350)	\$ (179,982)

The following table presents the pretax amounts reclassified from accumulated other comprehensive loss into our condensed consolidated statements of operations for the three months ended March 31, 2023 and 2022 (in thousands):

Comprehensive Income Components	Income Statement Line Item	Three Months Ended March 31,	
		2023	2022
Foreign currency translation adjustment:			
Foreign currency translation adjustment	Cost of sales	\$ 146	\$ —
Foreign currency translation adjustment	Other expense, net	(10)	(5)
Total foreign currency translation adjustment		136	(5)
Unrealized (loss) gain on derivative contracts:			
Foreign exchange forward contracts	Cost of sales	—	560
Commodity swap contracts	Cost of sales	(2,668)	—
Total unrealized (loss) gain on derivative contracts		(2,668)	560
Total (loss) gain reclassified		\$ (2,532)	\$ 555

17. Segment Reporting

Our primary segment is our modules business, which involves the design, manufacture, and sale of cadmium telluride (“CdTe”) solar modules, which convert sunlight into electricity. Third-party customers of our modules segment include developers and operators of systems, utilities, independent power producers, commercial and industrial companies, and other system owners. Our residual business operations include certain project development activities, O&M services, the results of operations from PV solar power systems we owned and operated in certain international regions, and the sale of such systems to third-party customers.

See Note 19. “Segment and Geographical Information” in our Annual Report on Form 10-K for the year ended December 31, 2022 for additional discussion of our segment reporting.

The following tables provide a reconciliation of certain financial information for our reportable segment to information presented in our condensed consolidated financial statements for the three months ended March 31, 2023 and 2022 and as of March 31, 2023 and December 31, 2022 (in thousands):

	Three Months Ended March 31, 2023			Three Months Ended March 31, 2022		
	Modules	Other	Total	Modules	Other	Total
Net sales	\$ 536,590	\$ 11,696	\$ 548,286	\$ 354,881	\$ 12,159	\$ 367,040
Gross profit	106,894	5,157	112,051	11,189	274	11,463
Depreciation and amortization expense	61,583	2	61,585	56,199	2,846	59,045

	March 31, 2023			December 31, 2022		
	Modules	Other	Total	Modules	Other	Total
Goodwill	\$ 14,462	\$ —	\$ 14,462	\$ 14,462	\$ —	\$ 14,462

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

Cautionary Statement Regarding Forward-Looking Statements

This Quarterly Report on Form 10-Q contains forward-looking statements within the meaning of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the Securities Act of 1933, as amended (the "Securities Act"), which are subject to risks, uncertainties, and assumptions that are difficult to predict. All statements in this Quarterly Report on Form 10-Q, other than statements of historical fact, are forward-looking statements. These forward-looking statements are made pursuant to safe harbor provisions of the Private Securities Litigation Reform Act of 1995. The forward-looking statements include statements, among other things, concerning: effects resulting from certain module manufacturing changes; our business strategy, including anticipated trends and developments in and management plans for our business and the markets in which we operate; future financial results, operating results, module volumes produced, module volumes sold, revenues, gross margin, operating expenses, products, projected costs (including estimated future module collection and recycling costs), warranties, solar module technology and cost reduction roadmaps, restructuring, product reliability, investments, and capital expenditures; our ability to continue to reduce the cost per watt of our solar modules; the impact of public policies; the potential impact of legislation intended to encourage renewable energy investments through tax credits; our ability to expand manufacturing capacity worldwide; the impact of supply chain disruptions, which may affect the procurement of raw materials used in our manufacturing process and the distribution of our modules; R&D programs and our ability to improve the wattage of our solar modules; sales and marketing initiatives; and competition. In some cases, you can identify these statements by forward-looking words, such as "estimate," "expect," "anticipate," "project," "plan," "intend," "seek," "believe," "forecast," "foresee," "likely," "may," "should," "goal," "target," "might," "will," "could," "predict," "continue," "contingent," and the negative or plural of these words, and other comparable terminology.

Forward-looking statements are only predictions based on our current expectations and our projections about future events. All forward-looking statements included in this Quarterly Report on Form 10-Q are based upon information available to us as of the filing date of this Quarterly Report on Form 10-Q and therefore speak only as of the filing date. You should not place undue reliance on these forward-looking statements. We undertake no obligation to update any of these forward-looking statements for any reason, whether as a result of new information, future developments, or otherwise. These forward-looking statements involve known and unknown risks, uncertainties, and other factors that may cause our actual results, levels of activity, performance, or achievements to differ materially from those expressed or implied by these statements. These factors include, but are not limited to:

- structural imbalances in global supply and demand for PV solar modules;
- the market for renewable energy, including solar energy;
- our competitive position and other key competitive factors;
- the reduction, elimination, or expiration of government subsidies, policies, and support programs for solar energy projects and other renewable energy projects;
- the impact of public policies, such as tariffs or other trade remedies imposed on solar cells and modules;
- the passage of legislation intended to encourage renewable energy investments through tax credits, such as the IRA;
- our ability to execute on our long-term strategic plans, including our ability to secure financing;
- our ability to execute on our solar module technology and cost reduction roadmaps;

- our ability to incorporate technology improvements into our manufacturing process, including the implementation of our Copper Replacement (“CuRe”) program, the production of bifacial solar modules, and next generation Series 7 modules;
- our ability to improve the wattage of our solar modules;
- interest rate fluctuations and our customers’ ability to secure financing;
- the loss of any of our large customers, or the ability of our customers and counterparties to perform under their contracts with us;
- the severity and duration of public health threats (including pandemics such as COVID-19), including its potential impact on the Company’s business, financial condition, and results of operations;
- the satisfaction of conditions precedent in our sales agreements;
- our ability to attract new customers and to develop and maintain existing customer and supplier relationships;
- our ability to construct new production facilities to support new product lines;
- general economic and business conditions, including those influenced by U.S., international, and geopolitical events;
- environmental responsibility, including with respect to CdTe and other semiconductor materials;
- claims under our limited warranty obligations;
- changes in, or the failure to comply with, government regulations and environmental, health, and safety requirements;
- effects arising from and results of pending litigation;
- future collection and recycling costs for solar modules covered by our module collection and recycling program;
- supply chain disruptions, including demurrage and detention charges;
- our ability to protect our intellectual property;
- our ability to prevent and/or minimize the impact of cyber-attacks or other breaches of our information systems;
- our continued investment in R&D;
- the supply and price of components and raw materials, including CdTe;
- our ability to attract and retain key executive officers and associates; and
- all other matters discussed in Item 1A. “Risk Factors” of our Annual Report on Form 10-K for the year ended December 31, 2022, elsewhere in this Quarterly Report on Form 10-Q, and our other reports filed with the SEC.

You should carefully consider the risks and uncertainties described in this section. The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our condensed consolidated financial statements and the related notes thereto included in this Quarterly Report on Form 10-Q.

Executive Overview

We are a leading American solar technology company and global provider of PV solar energy solutions. Developed at our R&D labs in California and Ohio, we manufacture and sell PV solar modules with an advanced thin film semiconductor technology that provide a high-performance, lower-carbon alternative to conventional crystalline silicon PV solar modules. From raw material sourcing through end-of-life module recycling, we are committed to reducing the environmental impacts and enhancing the social and economic benefits of our products across their life cycle. We are the world's largest thin film PV solar module manufacturer and the largest PV solar module manufacturer in the Western Hemisphere.

Certain of our financial results and other key operational developments for the three months ended March 31, 2023 include the following:

- Net sales for the three months ended March 31, 2023 increased by 49% to \$548.3 million compared to \$367.0 million for the same period in 2022. The increase was primarily driven by an increase in the volume of modules sold to third parties.
- Gross profit for the three months ended March 31, 2023 increased 17.3 percentage points to 20.4% from 3.1% for the same period in 2022. The increase in gross profit was primarily due to the initial recognition of the advanced manufacturing production credit under Section 45X of the IRC, continued module cost reductions, and the higher volume of modules sold in the current period, partially offset by higher under-utilization charges associated with the initial ramp of our first Series 7 manufacturing facility in Ohio.
- During the three months ended March 31, 2023, we commenced commercial production of Series 7 modules at our third facility in Ohio, bringing our total installed nameplate module production capacity across all our Series 6 and Series 7 facilities to approximately 13 GW_{DC}. During the three months ended March 31, 2023, we produced 2.5 GW_{DC} and sold 1.9 GW_{DC} of solar modules. During 2023, we expect to produce between 11.5 GW_{DC} and 12.2 GW_{DC} and sell between 11.8 GW_{DC} and 12.3 GW_{DC} of solar modules.
- During the three months ended March 31, 2023, we ran our Series 6 manufacturing facilities at 98% capacity utilization, which represented a seven percentage point increase from the same period in 2022.
- During the three months ended March 31, 2023, we established a new world record CdTe research cell conversion efficiency of 22.3%, which was certified by the U.S. Department of Energy's National Renewable Energy Laboratory. Such record cell conversion efficiency is based on our CuRe program, which replaces copper with certain other elements that are expected to enhance module performance. Among other things, the anticipated future implementation of our CuRe program is expected to improve the temperature coefficient and reduce the warranted degradation of our modules, thereby enabling our PV solar modules to produce more energy in real world operating conditions over their estimated useful life than crystalline silicon modules with the same nameplate capacity.

Market Overview

Solar energy is one of the fastest growing forms of renewable energy with numerous economic and environmental benefits that make it an attractive complement to and/or substitute for traditional forms of energy generation. In recent years, the cost of producing electricity from PV solar power systems has decreased to levels that are competitive with or below the wholesale price of electricity in many markets. This price decline has opened new possibilities to develop systems in many locations with limited or no financial incentives, thereby promoting the widespread adoption of solar energy. Other technological developments in the industry, such as the advancement of energy storage capabilities, have further enhanced the prospects of solar energy as an alternative to traditional forms of energy generation. In addition to these economic benefits, solar energy has substantial environmental benefits. For example, PV solar power systems generate no greenhouse gas or other emissions and use minimal amounts of water compared to traditional energy generation assets. As a result of these and other factors, worldwide solar markets continue to develop and expand.

Recently enacted government support programs, such as the IRA, have contributed and are expected to continue to contribute to this momentum by providing solar module manufacturers, project developers, and project owners with tax incentives to accelerate the ongoing transition to clean energy. Based on recent U.S. Treasury Department estimates, the IRA is expected to provide aggregate funding of \$369 billion to address climate change, of which \$270 billion is expected in the form of various tax incentives. Among other things, the IRA (i) reinstates the 30% investment tax credit for qualifying solar projects that meet certain wage and apprenticeship requirements, (ii) extends the production tax credit to include energy generated from solar projects, (iii) provides incremental investment and production tax credits for solar projects that meet certain domestic content and location requirements, and (iv) offers tax credits for solar modules and solar module components manufactured in the United States and sold to third parties.

Supply and demand. As a result of the market opportunities and increased demand described above, we are in the process of expanding our manufacturing capacity by approximately 7.7 GW_{DC}, including the construction of our first manufacturing facility in India, which is expected to commence operations in the second half of 2023; our fourth manufacturing facility in the United States, which is expected to commence operations in late 2024; and the expansion of our manufacturing footprint at our existing facilities in Ohio. We continue to evaluate opportunities for future expansion, particularly within the United States. In the aggregate, we believe manufacturers of solar cells and modules, particularly those in China, have significant installed production capacity, relative to global demand, and the ability for additional capacity expansion. Accordingly, we believe the solar industry may experience periods of structural imbalance between supply and demand, which could lead to periods of pricing volatility. In light of such market realities, we continue to focus on our strategies and points of differentiation, which include our advanced module technology, our manufacturing process, our R&D capabilities, the sustainability advantage of our modules, and our financial stability. As a result of this focus, we recently commenced commercial production of Series 7 modules at our third manufacturing facility in Ohio.

Pricing competition. The solar industry has been characterized by intense pricing competition, both at the module and system levels. This competition may result in an environment in which pricing falls rapidly, thereby potentially increasing demand for solar energy solutions but constraining the ability for project developers and module manufacturers to sustain meaningful and consistent profitability. Our results of operations could be adversely affected if competitors reduce pricing to levels below their costs, bid aggressively low prices for module sale agreements, or are able to operate at minimal or negative operating margins for sustained periods of time. For certain of our competitors, including many in China, these practices may be enabled by their direct or indirect access to sovereign capital or other forms of state support. Although module average selling prices in many global markets have declined for several years, recent module spot pricing has increased, in part, due to trade measures and policies, government regulations, raw material availability, and supply chain disruptions. For example, module spot pricing in the United States has increased primarily due to the rising demand for modules manufactured in the United States as a result of the IRA and, in part, due to elevated commodity and logistics costs. The duration of this elevated period of pricing is uncertain.

Diverse offerings. We face intense competition from manufacturers of crystalline silicon solar modules and other emerging technologies. Solar module manufacturers compete with one another on sales price per watt, which may be influenced by several module value attributes, including wattage (through a larger form factor or an improved conversion efficiency), energy yield, degradation, sustainability, and reliability. Sales price per watt may also be influenced by warranty terms and customer payment terms. While conventional solar modules are monofacial, meaning their ability to produce energy is a function of direct and diffuse irradiance on their front side, most module manufacturers offer bifacial modules that also capture diffuse irradiance on the back side of a module. We currently produce monofacial solar modules and, based on recent R&D activities, expect to produce bifacial solar modules in the near term. Bifaciality compromises nameplate efficiency, but by converting both front and rear side irradiance, such technology may improve the overall energy production of a module relative to nameplate efficiency in certain applications, which could potentially lower the overall levelized cost of electricity (“LCOE”) of a system when compared to systems using monofacial solar modules. Additionally, certain module manufacturers have introduced n-type mono-crystalline modules, such as tunnel oxide passivated contact modules, which are expected to provide certain improvements to module efficiency, temperature coefficient, and bifacial performance, and claim to provide certain degradation advantages compared to other mono-crystalline modules.

Product efficiencies. We believe we are among the lowest cost module manufacturers in the solar industry on a module cost per watt basis, based on publicly available information. This cost competitiveness allows us to compete favorably in markets where pricing for modules and systems is highly competitive. Our cost competitiveness is based in large part on our advanced thin film semiconductor technology, module wattage (or conversion efficiency), proprietary manufacturing process (which enables us to produce a CdTe module in a matter of hours using a continuous and highly automated industrial manufacturing process, as opposed to a batch process), and our focus on operational excellence. In addition, our CdTe modules use approximately 2% to 3% of the amount of semiconductor material that is used to manufacture conventional crystalline silicon solar modules. The cost of polysilicon is a significant driver of the manufacturing cost of crystalline silicon solar modules, and the timing and rate of change in the cost of silicon feedstock and polysilicon could lead to changes in solar module pricing levels. In recent years, polysilicon consumption per cell has been reduced through various initiatives, which have contributed to declines in our relative manufacturing cost competitiveness over conventional crystalline silicon module manufacturers.

Energy performance. In many climates our solar modules provide certain energy production advantages relative to competing crystalline silicon solar modules. For example, our CdTe solar technology provides:

- a superior temperature coefficient, which results in stronger system performance in typical high insolation climates as the majority of a system’s generation, on average, occurs when module temperatures are well above 25°C (standard test conditions);
- a superior spectral response in humid environments where atmospheric moisture alters the solar spectrum relative to standard test conditions;
- a better partial shading response than competing crystalline silicon technologies, which may experience significantly lower energy generation than CdTe solar modules when partial shading occurs; and
- an immunity to cell cracking and its resulting power output loss, a common failure often observed in crystalline silicon modules caused by poor manufacturing, handling, weather, or other conditions.

In addition to these technological advantages, we also warrant that our solar modules will produce at least 98% of their labeled power output rating during the first year, with the warranty coverage reducing by a degradation factor between 0.3% and 0.5%, depending on the module series, every year thereafter throughout the limited power output warranty period of up to 30 years. As a result of these and other factors, our solar modules can produce more annual energy in real world operating conditions than conventional crystalline silicon modules with the same nameplate capacity.

While our modules are generally competitive in cost, reliability, and performance attributes, there can be no guarantee such competitiveness will continue to exist in the future to the same extent or at all. Any declines in the competitiveness of our products could result in further declines in the average selling prices of our modules and additional margin compression. We continue to focus on enhancing the competitiveness of our solar modules through our module technology and cost reduction roadmaps.

Certain Trends and Uncertainties

We believe that our business, financial condition, and results of operations may be favorably or unfavorably impacted by the following trends and uncertainties. See Item 1A. “Risk Factors” of our Annual Report on Form 10-K for the year ended December 31, 2022 for discussions of other risks (the “Risk Factors”) that may affect us.

Our business is evolving worldwide and is shaped by the varying ways in which our offerings can be compelling and economically viable solutions to energy needs in various markets. In addressing electricity demands, we are focused on providing utility-scale module offerings in key geographic markets that we believe have a significant need for mass-scale PV solar electricity, including markets throughout the United States, India, and Europe. We closely evaluate and monitor the appropriate level of resources required to support such markets and their associated sales opportunities. When deployed in utility-scale applications, our modules provide energy at a lower LCOE compared to traditional forms of energy generation, making them an attractive alternative to or replacement for aging fossil fuel-based generation resources. Accordingly, future retirements of aging energy generation resources represent a significant increase in the potential market for solar energy.

We believe that utility-scale solar will continue to be a compelling offering for companies with technology and cost leadership and will continue to represent an increasing portion of the overall electricity generation mix. However, this focus on utility-scale module offerings exists within a current market environment that includes rooftop and distributed generation solar. Consequently, our future module offerings in certain markets may be driven, in part, by demand for rooftop and distributed generation solar solutions. For example, we continue to evaluate opportunities to develop and leverage other solar cell technologies in multi-junction applications that utilize our thin film PV technology. We believe such applications have the potential to enable our module conversion efficiency to reach 28% by 2030.

Demand for our PV solar module offerings depends, in part, on market factors outside our control. For example, many governments have proposed or enacted policies or support programs intended to encourage renewable energy investments to achieve decarbonization objectives and/or establish greater energy independence. While we compete in markets that do not require solar-specific government subsidies or support programs, our net sales and profits remain subject to variability based on the availability and size of government subsidies and economic incentives. Adverse changes in these factors could increase the cost of utility-scale systems, which could reduce demand for our solar modules. Recent developments to government support programs include the following:

- *United States.* In August 2022, the U.S. President signed the IRA into law, which is intended to accelerate the country’s ongoing transition to clean energy. Among other things, the financial incentives provided by the IRA are expected to significantly increase demand for modules manufactured in the United States. Accordingly, the demand for these solar modules is expected to increase domestic manufacturing in the near term, which may result in localized supply chain constraints and periods of inflationary pricing for certain of our key raw materials, including substrate glass and cover glass. The financial incentives provided by the IRA are also expected to significantly increase demand for solar modules in general due to the incremental tax credit available for the qualified production of clean hydrogen that is powered by renewable resources. Given the complexities of the IRA, which is pending technical guidance and regulations from the IRS and U.S. Treasury Department, we continue to evaluate the extent of benefits available to us, which we expect will favorably impact our results of operations in future periods. For example, we currently expect to qualify for the advanced manufacturing production credit under Section 45X of the IRC, which provides certain specified benefits for solar modules and solar module components

manufactured in the United States and sold to third parties. See Note 6. "Government Grants" to our condensed consolidated financial statements for discussion of our expectation of the financial benefits available to us under the IRA.

- *India.* In March 2023, the government of India allocated financial incentives under the Production Linked Incentive ("PLI") scheme to certain PV module manufacturers, including First Solar. The PLI scheme is expected to provide aggregate funding of INR 185 billion (\$2.3 billion), of which INR 11.8 billion (\$143 million) was allocated to First Solar, to promote the manufacturing of high efficiency solar modules in India and to reduce India's dependency on foreign imports of solar modules. Under the PLI scheme, manufacturers were selected through a competitive bid process and may be entitled to receive certain cash incentives over a five-year period following the commissioning of their manufacturing facilities. Among other things, such incentives are subject to attaining certain minimum thresholds for module efficiency and temperature coefficient and require that a certain proportion of raw materials be sourced from the domestic market. Such conditions will be evaluated on a quarterly basis from 2026 through 2031. At this time, it is uncertain to what extent we may qualify for such incentives.

Demand for our solar energy solutions also depends on domestic or international trade policies and government regulations, which may be proposed, revised, and/or enacted across short- and long-term time horizons with varying degrees of impact to our net sales, profit, and manufacturing operations. Changes in these policies and regulations could adversely impact the competitive landscape of solar markets, which could reduce demand for our solar modules. Recent revisions or proposed changes to trade policy and government regulations include the following:

- *United States.* In June 2022, the U.S. President authorized the U.S. Secretary of Commerce to provide a 24-month antidumping and countervailing duty tariff exemption for imported solar panels from certain Southeast Asian countries. The U.S. Department of Commerce ("USDOC") has issued regulations implementing that moratorium on antidumping and countervailing duties in the event that it finds circumvention with respect to such Southeast Asian countries. In December 2022, the USDOC issued affirmative preliminary determinations finding "country-wide" circumvention with respect to certain countries, but it also found that certain companies were not circumventing the antidumping and countervailing duties. The USDOC is scheduled to issue its final circumvention determinations in May 2023, subject to possible extension. Our operating results could be adversely impacted if the USDOC makes negative circumvention determinations or refrains from imposing antidumping and countervailing duties on imports covered by affirmative circumvention determinations. Conversely, affirmative final circumvention determinations could positively impact our operating results. Separately, the U.S. President has also authorized the use of the Defense Production Act to expand domestic production of clean energy technologies. At this time, it is uncertain what impact, if any, these developments will have on future investments in solar module manufacturing in the United States.
- *India.* The Approved List of Module Manufacturers ("ALMM") was introduced in 2021 as a non-tariff barrier to incentivize domestic manufacturing of PV modules by approving the list of models and manufacturers who can participate in certain solar development projects. The ALMM is approved by the Ministry of New and Renewable Energy, and any modifications to the ALMM and its application may affect future investments in solar module manufacturing in India. Our ability to sell modules in the Indian market depends on the inclusion of our modules on the ALMM, and we currently expect that we will be included in the ALMM once we begin manufacturing solar panels in India in the second half of 2023. In March 2023, the government of India temporarily suspended the ALMM, thereby exempting solar project developers from procuring modules from companies included in the ALMM through March 2024. Our operating results could be adversely impacted if such suspension is extended in future periods or if the ALMM restriction is significantly relaxed to allow modules to be imported from countries that are part of the Association of Southeast Asian Nations.

Our ability to provide solar modules on economically attractive terms is also affected by the availability and cost of logistics services associated with the procurement of raw materials or equipment used in our manufacturing process and the shipping, handling, storage, and distribution of our modules. For example, although the cost of ocean freight throughout many parts of the world has recently decreased, certain logistics costs remain at elevated levels relative to pre-COVID-19 pandemic rates. Such factors may disrupt our supply chain and adversely impact our manufacturing operations as several of our key raw materials and components are either single-sourced or sourced from a limited number of international suppliers. While it is currently unclear how long these issues will persist, they may be further exacerbated by the disruption of major shipping routes or other economic disruptions. We may also incur additional logistics costs, such as demurrage and detention, to the extent we are unable to retrieve or return our shipping containers in a timely manner. To mitigate such costs and better meet our customer commitments, we may adjust our shipping plans to include additional lead times for module deliveries and/or utilize our network of U.S. distribution centers. We are also employing module contract structures that provide additional consideration to us if the cost of logistics services, excluding demurrage and detention, exceeds a defined threshold. Additionally, our manufacturing capacity expansions in the U.S. and India are expected to bring manufacturing activities closer to customer demand, further mitigating our exposure to the cost of ocean freight.

We generally price and sell our solar modules on a per watt basis. As of March 31, 2023, we had entered into contracts with customers for the future sale of 69.4 GW_{DC} of solar modules for an aggregate transaction price of \$20.4 billion, which we expect to recognize as revenue through 2029 as we transfer control of the modules to the customers. Such volume includes contracts for the sale of 34.5 GW_{DC} of solar modules that include transaction price adjustments associated with future module technology improvements, including new product designs and enhancements to certain energy related attributes. Based on these potential technology improvements, the contracted module volumes as of March 31, 2023, the expected timing such technology improvements are incorporated into our manufacturing process, and the expected timing of module deliveries, such adjustments, if realized, could result in additional revenue of up to \$0.7 billion, the majority of which would be recognized in 2025, 2026, and 2027. In addition to these price adjustments, certain of our contracts with customers may include favorable price adjustments associated with the extension of the ITC and/or sales freight in excess of a defined threshold. Certain of our contracts with customers may also include favorable or unfavorable price adjustments associated with changes to certain commodity prices and/or the module wattage committed for delivery. As a result, the revenue recognized from such contracts may increase or decrease in future periods relative to the original transaction price.

We continue to increase the nameplate production capacity of our existing manufacturing facilities by improving our production throughput, increasing module wattage (or conversion efficiency), and reducing manufacturing yield losses. Additionally, we recently commenced commercial production of Series 7 modules at our third manufacturing facility in Ohio, and are in the process of expanding our manufacturing capacity by approximately 7.7 GW_{DC}, including the construction of our first manufacturing facility in India, which is expected to commence operations in the second half of 2023; our fourth manufacturing facility in the United States, which is expected to commence operations in late 2024; and the expansion of our manufacturing footprint at our existing facilities in Ohio. This additional capacity, and any other potential investments to add to or otherwise modify our existing manufacturing capacity in response to market demand and competition, may require significant internal and possibly external sources of capital, and may be subject to certain risks and uncertainties described in Item 1A. “Risk Factors” of our Annual Report on Form 10-K for the year ended December 31, 2022.

Results of Operations

The following table sets forth our condensed consolidated statements of operations as a percentage of net sales for the three months ended March 31, 2023 and 2022:

	Three Months Ended March 31,	
	2023	2022
Net sales	100.0 %	100.0 %
Cost of sales	79.6 %	96.9 %
Gross profit	20.4 %	3.1 %
Selling, general and administrative	8.0 %	10.0 %
Research and development	5.6 %	7.4 %
Production start-up	3.6 %	2.0 %
Gain on sales of businesses, net	— %	0.5 %
Operating income (loss)	3.3 %	(15.7)%
Foreign currency loss, net	(1.1)%	(1.1)%
Interest income	4.7 %	0.6 %
Interest expense, net	(0.1)%	(0.8)%
Other expense, net	(0.3)%	(0.1)%
Income tax benefit	1.3 %	5.3 %
Net income (loss)	7.8 %	(11.8)%

Segment Overview

Our primary segment is our modules business, which involves the design, manufacture, and sale of CdTe solar modules, which convert sunlight into electricity. Third-party customers of our modules segment include developers and operators of systems, utilities, independent power producers, commercial and industrial companies, and other system owners. Our residual business operations include certain project development activities, O&M services, the results of operations from PV solar power systems we owned and operated in certain international regions, and the sale of such systems to third-party customers.

Net sales

We generally price and sell our solar modules on a per watt basis. During the three months ended March 31, 2023, we sold the majority of our solar modules to developers and operators of systems in the United States, and substantially all of our modules business net sales were denominated in U.S. dollars. We recognize revenue for module sales at a point in time following the transfer of control of the modules to the customer, which typically occurs upon shipment or delivery depending on the terms of the underlying contracts. Net sales from our residual business operations primarily consists of revenue recognized for sales of development projects or completed systems, including any modules installed in such systems and any revenue from energy generated by such systems.

The following table shows net sales by reportable segment for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2023	2022		
Modules	\$ 536,590	\$ 354,881	\$ 181,709	51 %
Other	11,696	12,159	(463)	(4)%
Net sales	\$ 548,286	\$ 367,040	\$ 181,246	49 %

Net sales from our modules segment increased \$181.7 million for the three months ended March 31, 2023 compared to the three months ended March 31, 2022 primarily due to a 51% increase in the volume of modules sold to third parties. Net sales from our residual business operations during the three months ended March 31, 2023 was consistent with the three months ended March 31, 2022.

Cost of sales

Our modules business cost of sales includes the cost of raw materials and components for manufacturing solar modules, such as glass, transparent conductive coatings, CdTe and other thin film semiconductors, laminate materials, connector assemblies, edge seal materials, and frames. In addition, our cost of sales includes direct labor for the manufacturing of solar modules and manufacturing overhead, such as engineering, equipment maintenance, quality and production control, and information technology. Our cost of sales also includes depreciation of manufacturing plant and equipment, facility-related expenses, environmental health and safety costs, and costs associated with shipping, warranties, and solar module collection and recycling (excluding accretion). Cost of sales for our residual business operations primarily consists of project-related costs, such as development costs (legal, consulting, transmission upgrade, interconnection, permitting, and other similar costs), EPC costs (consisting primarily of solar modules, inverters, electrical and mounting hardware, project management and engineering, and construction labor), and site specific costs.

The following table shows cost of sales by reportable segment for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2023	2022		
Modules	\$ 429,696	\$ 343,692	\$ 86,004	25 %
Other	6,539	11,885	(5,346)	(45)%
Cost of sales	\$ 436,235	\$ 355,577	\$ 80,658	23 %
% of net sales	79.6 %	96.9 %		

Cost of sales increased \$80.7 million, or 23%, and decreased 17.3 percentage points as a percent of net sales for the three months ended March 31, 2023 compared to the three months ended March 31, 2022. The increase in cost of sales was driven by an \$86.0 million increase in our modules segment cost of sales primarily due to higher costs of \$163.6 million from an increase in the volume of modules sold and higher under-utilization charges associated with the initial ramp of our first Series 7 manufacturing facility in Ohio, which increased cost of sales by \$18.9 million, partially offset by our initial recognition of the advanced manufacturing production credit under Section 45X of the IRC, which decreased cost of sales by \$70.1 million, and continued module cost reductions, which decreased cost of sales by \$32.6 million. Such increase to our modules segment cost of sales was partially offset by a \$5.3 million decrease in our residual business operations cost of sales primarily due to lower costs associated with operating PV solar power systems and providing O&M services in certain international jurisdictions following the sale of such systems and businesses in the prior period.

Gross profit

Gross profit may be affected by numerous factors, including the selling prices of our modules and the selling prices of projects and services included in our residual business operations, our manufacturing costs, the capacity utilization of our manufacturing facilities, and foreign exchange rates. Gross profit may also be affected by the mix of net sales from our modules business and residual business operations.

The following table shows gross profit for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2023	2022		
Gross profit	\$ 112,051	\$ 11,463	\$ 100,588	>100%
% of net sales	20.4 %	3.1 %		

Gross profit increased 17.3 percentage points to 20.4% during the three months ended March 31, 2023 from 3.1% during the three months ended March 31, 2022 primarily due to the advanced manufacturing production credit described above, continued module cost reductions, and the higher volume of modules sold in the current period, partially offset by higher under-utilization charges associated with the initial ramp of our first Series 7 manufacturing facility mentioned above.

Selling, general and administrative

Selling, general and administrative expense consists primarily of salaries and other personnel-related costs, professional fees, insurance costs, and other business development and selling expenses.

The following table shows selling, general and administrative expense for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2023	2022		
Selling, general and administrative	\$ 44,028	\$ 36,728	\$ 7,300	20 %
% of net sales	8.0 %	10.0 %		

Selling, general and administrative expense for the three months ended March 31, 2023 increased compared to the three months ended March 31, 2022 primarily due to higher professional fees, higher employee share-based compensation expense, and higher employee travel and training expenses.

Research and development

Research and development expense consists primarily of salaries and other personnel-related costs; the cost of products, materials, and outside services used in our R&D activities; and depreciation and amortization expense associated with R&D specific facilities and equipment. We maintain a number of programs and activities to improve our technology and processes in order to enhance the performance and reduce the costs of our solar modules.

The following table shows research and development expense for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2023	2022		
Research and development	\$ 30,510	\$ 27,108	\$ 3,402	13 %
% of net sales	5.6 %	7.4 %		

Research and development expense for the three months ended March 31, 2023 increased compared to the three months ended March 31, 2022 primarily due to an increase in employee compensation expense resulting from an increase in headcount and higher employee share-based compensation expense.

Production start-up

Production start-up expense consists of costs associated with operating a production line before it is qualified for commercial production, including the cost of raw materials for solar modules run through the production line during the qualification phase, employee compensation for individuals supporting production start-up activities, and applicable facility related costs. Production start-up expense also includes costs related to the selection of a new site and implementation costs for manufacturing process improvements to the extent we cannot capitalize these expenditures.

The following table shows production start-up expense for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2023	2022		
Production start-up	\$ 19,494	\$ 7,338	\$ 12,156	166 %
% of net sales	3.6 %	2.0 %		

During the three months ended March 31, 2023, we incurred production start-up expense primarily for our first manufacturing facility in India, which is expected to commence operations in the second half of 2023, our third manufacturing facility in the U.S., which commenced commercial production of modules in early 2023, and for certain manufacturing upgrades at our Malaysian facilities. During the three months ended March 31, 2022, we incurred production start-up expense primarily for our third manufacturing facility in the U.S. and for certain manufacturing upgrades at our Malaysian facilities.

Gain on sales of businesses, net

The following table shows gain on sales of businesses, net for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2023	2022		
Gain on sales of businesses, net	\$ (17)	\$ 1,907	\$ (1,924)	(101)%
% of net sales	— %	0.5 %		

During the three months ended March 31, 2023, we recognized certain post-closing adjustments associated with the prior sale of our O&M operations in a foreign jurisdiction, which was included in “Gain on sales of businesses, net” in our condensed consolidated statements of operations.

In January 2022, we completed the sale of our Chilean O&M operations to a subsidiary of Clairvest for consideration of \$1.9 million. As a result of this transaction, we recognized a gain of \$1.9 million, net of transaction costs and post-closing adjustments, during the three months ended March 31, 2022. See Note 2. “Sales of Businesses” to our condensed consolidated financial statements for further information related to this transaction.

Foreign currency loss, net

Foreign currency loss, net consists of the net effect of gains and losses resulting from holding assets and liabilities and conducting transactions denominated in currencies other than our subsidiaries' functional currencies.

The following table shows foreign currency loss, net for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,			
	2023	2022	Three Month Change	
Foreign currency loss, net	\$ (5,947)	\$ (4,198)	\$ (1,749)	42 %

Foreign currency loss, net for the three months ended March 31, 2023 increased compared to the three months ended March 31, 2022 primarily due to higher costs associated with hedging activities related to our subsidiaries in India.

Interest income

Interest income is earned on our cash, cash equivalents, marketable securities, restricted cash, restricted cash equivalents, and restricted marketable securities. Interest income also includes interest earned from late customer payments.

The following table shows interest income for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,			
	2023	2022	Three Month Change	
Interest income	\$ 25,822	\$ 2,325	\$ 23,497	>100%

Interest income for the three months ended March 31, 2023 increased compared to the three months ended March 31, 2022 primarily due to higher interest rates on cash and marketable securities and higher average balances associated with marketable securities.

Interest expense, net

Interest expense, net is primarily comprised of interest incurred on long-term debt. We may capitalize interest expense to our project assets or property, plant and equipment when such costs qualify for interest capitalization, which reduces the amount of net interest expense reported in any given period.

The following table shows interest expense, net for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,			
	2023	2022	Three Month Change	
Interest expense, net	\$ (748)	\$ (2,865)	\$ 2,117	(74)%

Interest expense, net for the three months ended March 31, 2023 decreased compared to the three months ended March 31, 2022 primarily due to the assumption of our Luz del Norte project loans by a subsidiary of Toesca Asset Management in connection with the sale of the project in late 2022.

Other expense, net

Other expense, net is primarily comprised of miscellaneous items and realized gains and losses on the sale of marketable securities and restricted marketable securities.

The following table shows other expense, net for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2023	2022		
Other expense, net	\$ (1,456)	\$ (212)	\$ (1,244)	>100%

Other expense, net for the three months ended March 31, 2023 increased compared to the three months ended March 31, 2022 primarily due to the reduction of certain withholding taxes in a foreign jurisdiction in the prior period.

Income tax benefit

Income tax expense or benefit, deferred tax assets and liabilities, and liabilities for unrecognized tax benefits reflect our best estimate of current and future taxes to be paid. We are subject to income taxes in both the United States and numerous foreign jurisdictions in which we operate, principally Singapore, Malaysia, and Vietnam. Significant judgments and estimates are required to determine our consolidated income tax expense. The statutory federal corporate income tax rate in the United States is 21%, and the tax rates in Singapore, Malaysia, and Vietnam are 17%, 24%, and 20%, respectively. In Malaysia, we have been granted a long-term tax holiday, scheduled to expire in 2027, pursuant to which substantially all of our income earned in Malaysia is exempt from income tax, conditional upon our continued compliance with certain employment and investment thresholds. In Vietnam, we have been granted a long-term tax incentive, scheduled to expire at the end of 2036, pursuant to which income earned in Vietnam is subject to reduced annual tax rates, conditional upon our continued compliance with certain revenue and R&D spending thresholds.

The following table shows income tax benefit for the three months ended March 31, 2023 and 2022:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2023	2022		
Income tax benefit	\$ 6,888	\$ 19,499	\$ (12,611)	(65)%
Effective tax rate	(19.3)%	31.1 %		

Our tax rate is affected by recurring items, such as tax rates in foreign jurisdictions and the relative amounts of income we earn in those jurisdictions. The rate is also affected by discrete items that may occur in any given period, but are not consistent from period to period. Income tax benefit decreased by \$12.6 million during the three months ended March 31, 2023 compared to the three months ended March 31, 2022 primarily due to higher pretax income in the current period, partially offset by higher excess tax benefits associated with share-based compensation and the beneficial effect of tax law changes associated with the IRA.

Critical Accounting Policies and Estimates

In preparing our condensed consolidated financial statements in conformity with U.S. GAAP, we make estimates and assumptions that affect the amounts of reported assets, liabilities, revenues, and expenses, as well as the disclosure of contingent liabilities. Some of our accounting policies require the application of significant judgment in the selection of the appropriate assumptions for making these estimates. By their nature, these judgments are subject to an inherent degree of uncertainty. We base our judgments and estimates on our historical experience, our forecasts, and other available information as appropriate. We believe the judgments and estimates involved in accrued solar module collection and recycling, product warranties, accounting for income taxes, long-lived asset impairments, and government grants (described in further detail below) have the greatest potential impact on our condensed consolidated financial statements. The actual results experienced by us may differ materially and adversely from our estimates. To the extent there are material differences between our estimates and the actual results, our future results of operations will be affected. For a description of the accounting policies that require the most significant judgment and estimates in the preparation of our condensed consolidated financial statements, refer to our Annual Report on Form 10-K for the year ended December 31, 2022. There have been no material changes to our accounting policies during the three months ended March 31, 2023.

Government Grants. We continue to evaluate the extent of benefits available to us pursuant to the IRA, which we expect will favorably impact our results of operations in future periods. For example, we currently expect to qualify for the advanced manufacturing production credit under Section 45X of the IRC, which provides certain specified benefits for solar modules and solar module components manufactured in the United States and sold to third parties. For eligible components, the credit is equal to (i) \$12 per square meter for a PV wafer, (ii) 4 cents multiplied by the capacity of a PV cell, and (iii) 7 cents multiplied by the capacity of a PV module. Based on the current form factor of our modules, we expect to qualify for a credit of approximately 17 cents per watt for each module produced in the United States and sold to a third party.

There are currently several critical and complex aspects of the IRA pending technical guidance and regulations from the IRS and U.S. Treasury Department that could affect the estimated benefits we have recognized and expect to recognize from the advanced manufacturing production credit. Such pending guidance is described in Item 1A. “Risk Factors” of our Annual Report on Form 10-K for the year ended December 31, 2022. Any modifications to the law or its effects arising, for example, through (i) technical guidance and regulations from the IRS and U.S. Treasury Department, (ii) subsequent amendments to or interpretations of the law, and/or (iii) future laws or regulations rendering certain provisions of the IRA less effective or ineffective, in whole or in part, could result in material adverse changes to the benefits we have recognized and expect to recognize.

Recent Accounting Pronouncements

None.

Liquidity and Capital Resources

As of March 31, 2023, we believe that our cash, cash equivalents, marketable securities, cash flows from operating activities, and contracts with customers for the future sale of solar modules will be sufficient to meet our working capital and capital expenditure needs for at least the next 12 months. As necessary, we also believe we will have adequate access to the capital markets. We monitor our working capital to ensure we have adequate liquidity, both domestically and internationally. We intend to maintain appropriate debt levels based upon cash flow expectations, our overall cost of capital, and expected cash requirements for operations, including near-term construction activities and purchases of manufacturing equipment for our newest manufacturing and R&D facilities in India and the United States. However, our ability to raise capital on terms commercially acceptable to us could be constrained if there is insufficient lender or investor interest due to company-specific, industry-wide, or broader market concerns. Any incremental debt financings could result in increased debt service expenses and/or restrictive covenants, which could limit our ability to pursue our strategic plans.

As of March 31, 2023, we had \$2.3 billion in cash, cash equivalents, and marketable securities compared to \$2.6 billion as of December 31, 2022. The decrease in cash, cash equivalents, and marketable securities was primarily driven by purchases of property, plant and equipment, various operating expenditures, and certain advance payments of raw materials, partially offset by proceeds from borrowings under long-term debt agreements and cash receipts from module sales, including advance payments for future sales. As of March 31, 2023, \$1.4 billion of our cash, cash equivalents, and marketable securities was held by our foreign subsidiaries and was primarily based in U.S. dollar, Indian rupee, and Euro denominated holdings. Our investment policy seeks to preserve our investment principal and maintain adequate liquidity to meet our cash flow requirements, while at the same time optimizing the return on our investments. Such policy applies to all invested funds, whether managed internally or externally. Pursuant to such policy, we place our investments with a diversified group of high-quality financial institutions and limit the concentration of such investments with any one counterparty. We place significant emphasis on the creditworthiness of financial institutions and assess the credit ratings and financial health of our counterparty financial institutions when making investment decisions.

We utilize a variety of tax planning and financing strategies in an effort to ensure that our worldwide cash is available in the locations in which it is needed. If certain international funds were needed for our operations in the United States, we may be required to accrue and pay certain U.S. and foreign taxes to repatriate such funds. We maintain the intent and ability to permanently reinvest our accumulated earnings outside the United States, with the exception of our subsidiaries in Canada and Germany. In addition, changes to foreign government banking regulations may restrict our ability to move funds among various jurisdictions under certain circumstances, which could negatively impact our access to capital, resulting in an adverse effect on our liquidity and capital resources.

Although we compete in markets that do not require solar-specific government subsidies or support programs, such incentives continue to influence the demand for PV solar energy around the world. For example, the financial incentives provided by the IRA are expected to increase both the demand for and the domestic manufacturing of solar modules in the United States. We continue to evaluate the extent of benefits available to us by the IRA, which are expected to favorably impact our liquidity and capital resources in future periods. For example, we currently expect to qualify for the advanced manufacturing production credit under Section 45X of the IRC, which provides certain specified benefits for solar modules and solar module components manufactured in the United States and sold to third parties. Such credit may be refundable or transferable to a third party and is available from 2023 to 2032, subject to phase down beginning in 2030. Based on the current form factor of our modules, we expect to qualify for a credit of approximately 17 cents per watt for each module produced in the United States and sold to a third party. Accordingly, we expect the advanced manufacturing production credit will provide us with a significant source of funding throughout its 10-year period. For more information about certain risks associated with the benefits available to us under the IRA, see Item 1A. “Risk Factors” of our Annual Report on Form 10-K for the year ended December 31, 2022.

As a result of such market opportunities and increased demand for our products, we recently commenced commercial production of Series 7 modules at our third manufacturing facility in Ohio, and are in the process of expanding our manufacturing capacity by approximately 7.7 GW_{DC}, including the construction of our first manufacturing facility in India, which is expected to commence operations in the second half of 2023; our fourth manufacturing facility in the United States, which is expected to commence operations in late 2024; and the expansion of our manufacturing footprint at our existing facilities in Ohio. In aggregate, we currently expect to invest approximately \$2.0 billion for these remaining facilities and upgrades. As we expand our manufacturing capacity, we expect to continue to receive advance payments from customers for the future sale of modules. Such advance payments are reflected as deferred revenue in our consolidated balance sheets. As of March 31, 2023, our deferred revenue was approximately \$1.3 billion. Accordingly, the capital expenditures necessary to expand our capacity in the near term are expected to be financed, in part, by advance payments for module sales in future periods and by the advanced manufacturing production credit described above.

In addition to the expansion plans described above, we continue to increase the nameplate production capacity of our existing manufacturing facilities by improving our production throughput, increasing module wattage (or conversion efficiency), and reducing manufacturing yield losses. We have a demonstrated history of innovation, continuous improvement, and manufacturing success driven by our significant investments in various R&D initiatives. We continue to invest significant financial resources in such initiatives, including approximately \$0.4 billion for a dedicated R&D facility in the United States to support the implementation of our technology roadmap. We expect such R&D facility to feature a high-tech pilot manufacturing line, allowing for the production of full-sized prototypes of thin film and tandem PV modules. Such R&D facility is expected to be completed in 2024. During 2023, we expect to spend \$1.9 billion to \$2.1 billion for capital expenditures, including the new facilities mentioned above and upgrades to machinery and equipment that we believe will further increase our module wattage and expand capacity and throughput at our manufacturing facilities. These capital investments, and any other potential investments to implement our technology roadmap, may require significant internal and possibly external sources of capital, and may be subject to certain risks and uncertainties described in Item 1A. “Risk Factors” of our Annual Report on Form 10-K for the year ended December 31, 2022.

We have also committed and expect to continue committing significant working capital to purchase various raw materials used in our module manufacturing process. Our failure to obtain raw materials and components that meet our quality, quantity, and cost requirements in a timely manner could interrupt or impair our ability to manufacture our solar modules or increase our manufacturing costs. Accordingly, we may enter into long-term supply agreements to mitigate potential risks related to the procurement of key raw materials and components, and such agreements may be noncancelable or cancelable with a significant penalty. For example, we have entered into long-term supply agreements for the purchase of certain specified minimum volumes of substrate glass and cover glass for our PV solar modules. Our remaining purchases under these supply agreements are expected to be approximately \$3.7 billion of substrate glass and approximately \$279 million of cover glass. We have the right to terminate these agreements upon payment of specified termination penalties (which, in aggregate, are up to \$240 million as of March 31, 2023 and decline over the remaining supply periods). Additionally, for certain strategic suppliers, we have made, and may in the future be required to make, certain advance payments to secure the raw materials necessary for our module manufacturing.

We have also committed certain financial resources to fulfill our solar module collection and recycling obligations, and have established a trust under which these funds are put into custodial accounts with an established and reputable bank. As of March 31, 2023, such funds were comprised of restricted marketable securities of \$196.6 million and restricted cash and cash equivalents balances of \$2.6 million. As of March 31, 2023, our module collection and recycling liability was \$130.3 million. Trust funds may be disbursed for qualified module collection and recycling costs (including capital and facility related recycling costs), payments to customers for assuming collection and recycling obligations, and reimbursements of any overfunded amounts. Investments in the trust must meet certain investment quality criteria comparable to highly rated government or agency bonds. As necessary, we adjust the funded amounts for our estimated collection and recycling obligations based on the estimated costs of collecting and recycling covered modules, estimated rates of return on our restricted marketable securities, and an estimated solar module life of 25 years, less amounts already funded in prior years.

As of March 31, 2023, we had no off-balance sheet debt or similar obligations, other than financial assurance related instruments, which are not classified as debt. We do not guarantee any third-party debt. See Note 11. “Commitments and Contingencies” to our condensed consolidated financial statements for further information about our financial assurance related instruments.

Cash Flows

The following table summarizes key cash flow activity for the three months ended March 31, 2023 and 2022 (in thousands):

	Three Months Ended March 31,	
	2023	2022
Net cash used in operating activities	\$ (34,598)	\$ (138,839)
Net cash used in investing activities	(645,227)	(2,944)
Net cash provided by financing activities	107,686	5,764
Effect of exchange rate changes on cash, cash equivalents, restricted cash, and restricted cash equivalents	1,495	15,162
Net decrease in cash, cash equivalents, restricted cash, and restricted cash equivalents	<u>\$ (570,644)</u>	<u>\$ (120,857)</u>

Operating Activities

The decrease in net cash used in operating activities was primarily driven by higher expenditures for the construction of certain projects in Japan in the prior period and higher cash receipts from module sales in the current period, including advance payments for future sales, partially offset by certain advance payments for raw materials in the current period.

Investing Activities

The increase in net cash used in investing activities was primarily due to higher net purchases of marketable securities and restricted marketable securities and higher purchases of property, plant and equipment.

Financing Activities

The increase in net cash provided by financing activities was primarily due to higher borrowings under the India Credit Facility for the development and construction of our first manufacturing facility in India.

Item 3. *Quantitative and Qualitative Disclosures about Market Risk*

There have been no material changes to the information previously provided under Item 7A. of our Annual Report on Form 10-K for the year ended December 31, 2022.

Item 4. *Controls and Procedures*

Evaluation of Disclosure Controls and Procedures

We carried out an evaluation, under the supervision and with the participation of management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our “disclosure controls and procedures” as defined in Exchange Act Rule 13a-15(e) and 15d-15(e). Based on that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that as of March 31, 2023 our disclosure controls and procedures were effective to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in SEC rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Changes in Internal Control over Financial Reporting

We also carried out an evaluation, under the supervision and with the participation of management, including our Chief Executive Officer and Chief Financial Officer, of our “internal control over financial reporting” as defined in Exchange Act Rule 13a-15(f) and 15d-15(f) to determine whether any changes in our internal control over financial reporting occurred during the three months ended March 31, 2023 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. Based on that evaluation, there were no such changes in our internal control over financial reporting that occurred during the three months ended March 31, 2023.

CEO and CFO Certifications

We have attached as exhibits to this Quarterly Report on Form 10-Q the certifications of our Chief Executive Officer and Chief Financial Officer, which are required in accordance with the Exchange Act. We recommend that this Item 4. be read in conjunction with those certifications for a more complete understanding of the subject matter presented.

Limitations on the Effectiveness of Controls

Control systems, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control systems’ objectives are being met. Further, the design of any system of controls must reflect the fact that there are resource constraints, and the benefits of all controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within our company have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty and that breakdowns can occur because of error or mistake. Control systems can also be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the controls. The design of any system of controls is also based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with policies or procedures.

PART II. OTHER INFORMATION

Item 1. *Legal Proceedings*

See Note 11. “Commitments and Contingencies” under the heading “Legal Proceedings” of our condensed consolidated financial statements for legal proceedings and related matters.

Item 1A. *Risk Factors*

In addition to the other information set forth in this report, you should carefully consider the factors discussed in Item 1A. “Risk Factors” of our Annual Report on Form 10-K for the year ended December 31, 2022, which could materially affect our business, financial condition, results of operations, or cash flows. The risks described in our Annual Report on Form 10-K are not the only risks we face. Additional risks and uncertainties not currently known to us or that we currently consider immaterial may also materially adversely affect our business, financial condition, results of operations, or cash flows. There have been no material changes in the risk factors contained in our Annual Report on Form 10-K.

Item 6. *Exhibits*

The following exhibits are filed with this Quarterly Report on Form 10-Q:

Exhibit Number	Exhibit Description
3.1	Amended and Restated Certificate of Incorporation of First Solar, Inc. (incorporated by reference to Exhibit 3.1 to First Solar, Inc.’s Registration Statement on Form S-1 filed on October 25, 2006)
3.2	Amended and Restated Bylaws of First Solar, Inc. (incorporated by reference to Exhibit 3.1 to First Solar, Inc.’s Form 8-K filed on July 23, 2021)
10.1*	Form of Grant Notice for 2023-2025 Executive Performance Equity Plan
10.2*	Form of Grant Notice for Restricted Stock Unit Award
31.1*	Certification of Chief Executive Officer pursuant to 15 U.S.C. Section 7241, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Certification of Chief Financial Officer pursuant to 15 U.S.C. Section 7241, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1†	Certification of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	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
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover page formatted as Inline XBRL and contained in Exhibit 101

* Filed herewith.

† Furnished herewith. This exhibit shall not be deemed “filed” for purposes of Section 18 of the Exchange Act or otherwise subject to the liabilities of that section, nor shall it be deemed incorporated by reference in any filing under the Securities Act or the Exchange Act, whether made before or after the date hereof and irrespective of any general incorporation language in such filings.

SIGNATURE

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.

FIRST SOLAR, INC.

Date: April 27, 2023

By:	<u>/s/ BYRON JEFFERS</u>
Name:	Byron Jeffers
Title:	Chief Accounting Officer



**Executive Performance Equity Plan
GRANT NOTICE**

This Grant Notice sets forth the economic terms of a Performance Unit Award granted under the First Solar, Inc. 2020 Omnibus Incentive Compensation Plan (the “Plan”). This Grant Notice, together with the Performance Unit Award Agreement Form Perf Unit-015 (“Performance Unit Award Agreement”) (the terms of which are incorporated into this Grant Notice by reference), constitute the Award Agreement for this Performance Unit Award under the Executive Performance Equity Plan. Capitalized terms used in this Grant Notice that are not defined in this Grant Notice have the meanings as used or defined in the Performance Unit Award Agreement, or if not defined therein, the Plan. Additionally, the 2020 Omnibus Plan Prospectus is available for viewing on the First Solar POWER site.

Participant: [•]

Target # Performance Units: [•]

Grant Date: [•]

Performance Period: [Start Date] — [End Date]

Vesting Conditions: The number of Performance Units that vests is subject to the level of achievement of the following performance goals during the Performance Period (the “Performance-Vesting Conditions”):

Performance Level	Threshold (50%)	Target (100%)	Maximum (200%)	Weighting
[Metric 1]	[•]	[•]	[•]	[•]
[Metric 2]	[•]	[•]	[•]	[•]
[Metric 3]	[•]	[•]	[•]	[•]
[Metric 4]	[•]	[•]	[•]	[•]
[Metric 5]	[•]	[•]	[•]	[•]
[Metric 6]	[•]	[•]	[•]	[•]

The final number of Performance Units actually awarded following the end of the Performance Period, if any, shall be based on the weighted attainment of specified levels of the Performance-Vesting Conditions, and may range between 0% and 200% of the number of target Performance Units. More specifically, 0% of the target Performance Units shall be earned upon less than threshold performance achievement; 50% of the target Performance Units shall be earned upon threshold performance achievement, 100% of target Performance Units shall be earned upon target performance achievement and 200% of target Performance Units shall be earned upon maximum performance achievement (with linear interpolation between threshold and target performance achievement and between target and maximum performance achievement). Each Performance Unit represents the right to receive one share of the Company's common stock, no par value per share ("Share").

In determining achievement of the Performance-Vesting Conditions, the Committee may make such adjustments as it deems appropriate, including adjustments to performance metrics for events or circumstances as determined by the Committee. Further, the Committee may, in its sole discretion, reduce the number of Performance Units actually delivered hereunder even if the Performance-Vesting Conditions are achieved.

This Award shall not vest unless the Participant is continuously employed by the Company or an Affiliate through the settlement date following the end of the Performance Period, unless the Participant is eligible for a *pro rata* settlement as provided for in the Forfeiture section below.

Vesting Acceleration upon a
Change in Control:

Award is Assumed or Substituted. Upon the occurrence of a Change in Control (as defined in the Change of Control Severance Agreement between the Participant and the Company ("CIC Agreement")) that occurs during the Performance Period in which the acquirer assumes or substitutes the Performance Units, the Performance Units shall remain eligible to vest in accordance with the vesting provisions described above (including the Performance-Vesting Conditions, subject to adjustments as permitted under Section 4(b) of the Plan or Section 10 of the Performance Unit Award Agreement); provided, however, if, within the 24-month period following such Change in Control, the Participant's employment with the Company and its Affiliates is terminated (1) by the Company or one of its Affiliates without Cause (as defined in the CIC Agreement) or (2) by the Participant for Good Reason (as defined in the CIC Agreement), then the number of Performance Units determined based on the greater of (x) target or (y) actual achievement of the applicable Performance-Vesting Conditions as of the last day of the quarter preceding the date of termination shall become vested as of the date of such termination of employment, and promptly settled within 60 days following such date. This Award shall expire and be forfeited with respect to the unvested portion thereof if the applicable Performance-Vesting Conditions are not satisfied as of such date of termination.

Award is Not Assumed or Substituted. Upon the occurrence of a Change in Control in which the acquirer does not assume or substitute the Performance Units, the Performance Units shall be deemed immediately vested at the greater of (x) target or (y) actual achievement of the applicable Performance-Vesting Conditions as of the last day of the quarter preceding the Change in Control, and shall be promptly settled within 60 days following the Change in Control.

Coordination with CIC Agreement. For the avoidance of doubt, the provisions of Section 3 "Impact of a Change in Control on Equity Compensation Awards" in the CIC Agreement shall not apply to this Award.

Forfeiture: This Award shall be forfeited, with no consideration, upon termination of the Participant's employment provided, however that if such termination of employment occurs (x) on account of the Participant's death, (y) by the Company due to Disability (defined below), or (z) by the Participant due to a Retirement (defined below) occurring following the end of the first calendar year of the Performance Period, then the Participant shall be eligible for a *pro rata* settlement as described in the Settlement section below.

For this purpose, "Disability" shall have the meaning ascribed to such term (or term of similar import) in the employment agreement between the Participant and the Company, as in effect at the relevant time. "Retirement" shall mean the Participant's voluntary termination of employment provided that the Participant has (i) attained age fifty-five (55) or older as of the date of such termination and (ii) completed a minimum of ten (10) years of service as of the date of such termination. Notwithstanding anything to the contrary herein, if the Participant's employment is terminated due to a Retirement occurring following the end of the first calendar year of the Performance Period, the Participant shall be eligible for a *pro rata* settlement only if the Participant complies with the restrictive covenants set forth in the Non-Solicitation and Non-Competition Agreement by and between the Company and the Participant, as in effect on the date of such termination of employment through the settlement date of this Award.

Further, this Award shall expire and be forfeited with respect to the unvested portion thereof if the threshold Performance-Vesting Condition is not satisfied with respect to the Performance Period. For greater clarity, notwithstanding anything to the contrary herein, in the Performance Unit Award Agreement, or in any employment or other agreement between the Participant and the Company, no portion of this Award shall accelerate upon termination of the Participant's employment other than as expressly provided in this Grant Notice.

Settlement of Award: *Full Settlement:* Where the Participant is eligible for *full* settlement of this Award or any portion thereof, as soon as administratively practicable following the vesting of this Award but in any event on or prior to March 15th of the calendar year following the end of the Performance Period, the Participant shall receive one fully vested Share for each vested Performance Unit.

Pro Rata Settlement: Where the Participant is eligible for a *pro rata* settlement of this Award or any portion thereof because the Participant experienced a termination of employment described above prior to the settlement date, such *pro rata* portion shall be determined by multiplying (i) the number of Performance Units that would have vested based on actual achievement of the Performance-Vesting Conditions had the Participant remained employed until the settlement date by (ii) a fraction, (a) the numerator of which is the number of days the Participant was employed by the Company during the Performance Period up to the date of termination, and (b) the denominator of which is the number of days from and after the first day of the Performance Period through the end of the Performance Period, *rounding up* to the next whole Performance Unit. Such *pro rata* portion of the Performance Units shall be settled in Shares, on a one-for-one basis, as soon as administratively practicable following the vesting of this Award but in any event on or prior to March 15th of the calendar year following the end of the Performance Period. If the Participant becomes eligible for a *pro rata* settlement of this Award, then upon *pro rata* settlement the remainder of this Award shall be forfeited.

Settlement of Taxes:

Vesting and settlement of the Performance Units shall be subject to the Participant satisfying any applicable federal, state and local tax withholding obligations and non-U.S. tax withholding obligations. The amount of any withholding taxes in respect of the Performance Units shall be satisfied by having the Company withhold from the number of Performance Units payable to the Participant under this Award a number of Shares having a fair market value equal to such required tax withholding obligations. If, for any reason, the Shares that would otherwise be deliverable to the Participant upon settlement of the Performance Units would be insufficient to satisfy the tax withholding obligations, the Company and any of its Subsidiaries are authorized to withhold an amount from the Participant's wages or other compensation sufficient to fully satisfy the tax withholding obligations.

Clawback:

Pursuant to Section 9(s) of the Plan, this Award is subject to potential forfeiture or clawback to the fullest extent called for by Company policy or applicable law. By accepting this Award, the Participant agrees to be bound by, and to comply with, the terms of any such forfeiture or clawback provisions, including but not limited to, the terms of the First Solar, Inc. Clawback Policy, or any successor thereto.

Signature

Date



GRANT NOTICE

This Notice sets forth the economic terms of a Restricted Stock Unit (“RSU”) Award granted under the First Solar, Inc. 2020 Omnibus Incentive Compensation Plan. This Grant Notice, together with the Restricted Stock Unit Award Agreement Form RSU-015 (the terms of which are incorporated into this Grant Notice by reference), constitute the Award Agreement for this RSU Award.

Participant:	[●]		
Participant ID Number	[●]		
Award Grant Date:	[●]		
Award Number:	[●]		
Number of RSUs:	[●]		
Vesting:	Vesting Date	Vested % of Award	Number of RSUs to Vest
	[Vest date 1]	20%	[●]
	[Vest date 2]	20%	[●]
	[Vest date 3]	20%	[●]
	[Vest date 4]	20%	[●]
	[Vest date 5]	20%	[●]
Vesting Rules:	This Award shall vest on each Vesting Date with respect to the scheduled number of Shares, provided Participant is employed by the Company or an Affiliate on that date.		
Forfeiture:	The unvested portion of this Award is forfeitable upon Participant’s termination of employment prior to a Vesting Date unless: (1) the termination is by reason of death or (2) the Participant meets the definition of “Retirement,” as defined below. In the case of death or Retirement, the Participant or the Participant’s beneficiary, as applicable, will receive an additional twelve (12) months’ vesting credit. For this purpose, “Retirement” means the Participant’s voluntary termination of employment provided that the Participant has (i) attained age sixty (60) or older as of the date of such termination; (ii) completed a minimum of ten (10) years of service as of the date of such termination; and (iii) provided at least six (6) months’ advanced written notice to the Company or Affiliate of the Participant’s intent to retire.		
Tax Payment Method:	Withhold Shares		
Clawback:	Pursuant to Section 9(s) of the Plan, this Award is subject to potential forfeiture or clawback to the fullest extent called for by Company policy or applicable law. By accepting this Award, the Participant agrees to be bound by, and to comply with, the terms of any such forfeiture or clawback provisions, including but not limited to, the terms of the First Solar, Inc. Clawback Policy, or any successor thereto.		

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO 15 U.S.C. SECTION 7241, AS
ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Mark R. Widmar, certify that:

- (1) I have reviewed the Quarterly Report on Form 10-Q of First Solar, Inc., a Delaware corporation, for the period ended March 31, 2023, as filed with the Securities and Exchange Commission;
 - (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.
-

April 27, 2023

By: /s/ MARK R. WIDMAR
Name: Mark R. Widmar
Title: Chief Executive Officer

**CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO 15 U.S.C. SECTION 7241, AS
ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Alexander R. Bradley, certify that:

- (1) I have reviewed the Quarterly Report on Form 10-Q of First Solar, Inc., a Delaware corporation, for the period ended March 31, 2023, as filed with the Securities and Exchange Commission;
 - (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.
-

April 27, 2023

By: /s/ ALEXANDER R. BRADLEY
Name: Alexander R. Bradley
Title: Chief Financial Officer

**CERTIFICATION OF
CHIEF EXECUTIVE OFFICER AND CHIEF FINANCIAL OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Quarterly Report on Form 10-Q of First Solar, Inc., a Delaware corporation, for the period ended March 31, 2023, as filed with the Securities and Exchange Commission, each of the undersigned officers of First Solar, Inc. certifies pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to his respective knowledge:

- (1) the quarterly report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
- (2) the information contained in the quarterly report fairly presents, in all material respects, the financial condition and results of operations of First Solar, Inc. for the periods presented therein

April 27, 2023

By: /s/ MARK R. WIDMAR
Name: Mark R. Widmar
Title: Chief Executive Officer

April 27, 2023

By: /s/ ALEXANDER R. BRADLEY
Name: Alexander R. Bradley
Title: Chief Financial Officer