

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, 2020

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 85281

(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 May 1, 2020, 105,907,134 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, 2020

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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,	
	2020	2019
Net sales	\$ 532,124	\$ 531,978
Cost of sales	441,786	531,866
Gross profit	90,338	112
Operating expenses:		
Selling, general and administrative	58,587	45,352
Research and development	25,613	21,877
Production start-up	4,482	9,522
Total operating expenses	88,682	76,751
Operating income (loss)	1,656	(76,639)
Foreign currency (loss) income, net	(398)	172
Interest income	9,330	14,259
Interest expense, net	(6,789)	(10,121)
Other (expense) income, net	(2,222)	3,509
Income (loss) before taxes and equity in earnings	1,577	(68,820)
Income tax benefit	89,215	1,394
Equity in earnings, net of tax	(88)	(173)
Net income (loss)	\$ 90,704	\$ (67,599)
Net income (loss) per share:		
Basic	\$ 0.86	\$ (0.64)
Diluted	\$ 0.85	\$ (0.64)
Weighted-average number of shares used in per share calculations:		
Basic	105,595	105,046
Diluted	106,386	105,046

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,	
	2020	2019
Net income (loss)	\$ 90,704	\$ (67,599)
Other comprehensive loss:		
Foreign currency translation adjustments	(8,064)	(1,142)
Unrealized gain (loss) on marketable securities and restricted marketable securities, net of tax of \$389 and \$977	2,852	(3,347)
Unrealized gain (loss) on derivative instruments, net of tax of \$(79) and \$(27)	896	(58)
Other comprehensive loss	(4,316)	(4,547)
Comprehensive income (loss)	<u>\$ 86,388</u>	<u>\$ (72,146)</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, 2020	December 31, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 929,355	\$ 1,352,741
Marketable securities (amortized cost of \$586,628 and allowance for credit losses of \$215 at March 31, 2020)	579,340	811,506
Accounts receivable trade	293,612	476,425
Less: allowance for credit losses	(3,331)	(1,386)
Accounts receivable trade, net	290,281	475,039
Accounts receivable, unbilled and retainage	122,332	183,473
Less: allowance for credit losses	(1,223)	—
Accounts receivable, unbilled and retainage, net	121,109	183,473
Inventories	479,792	443,513
Balance of systems parts	44,718	53,583
Project assets	403	3,524
Prepaid expenses and other current assets	302,845	276,455
Total current assets	2,747,843	3,599,834
Property, plant and equipment, net	2,244,175	2,181,149
PV solar power systems, net	470,709	476,977
Project assets	388,511	333,596
Deferred tax assets, net	213,600	130,771
Restricted marketable securities (amortized cost of \$242,156 and allowance for credit losses of \$30 at March 31, 2020)	246,410	223,785
Goodwill	14,462	14,462
Intangible assets, net	63,918	64,543
Inventories	182,259	160,646
Other assets	377,254	329,926
Total assets	\$ 6,949,141	\$ 7,515,689
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 173,762	\$ 218,081
Income taxes payable	8,287	17,010
Accrued expenses	296,796	351,260
Current portion of long-term debt	81,807	17,510
Deferred revenue	136,998	323,217
Accrued litigation	13,000	363,000
Other current liabilities	21,785	28,130
Total current liabilities	732,435	1,318,208
Accrued solar module collection and recycling liability	138,009	137,761
Long-term debt	390,588	454,187
Other liabilities	519,487	508,766
Total liabilities	1,780,519	2,418,922
Commitments and contingencies		
Stockholders' equity:		
Common stock, \$0.001 par value per share; 500,000,000 shares authorized; 105,905,580 and 105,448,921 shares issued and outstanding at March 31, 2020 and December 31, 2019, respectively	106	105
Additional paid-in capital	2,844,055	2,849,376
Accumulated earnings	2,408,111	2,326,620
Accumulated other comprehensive loss	(83,650)	(79,334)
Total stockholders' equity	5,168,622	5,096,767
Total liabilities and stockholders' equity	\$ 6,949,141	\$ 7,515,689

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, 2020					
	Common Stock		Additional Paid-In Capital	Accumulated Earnings	Accumulated Other Comprehensive (Loss) Income	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2019	105,449	\$ 105	\$ 2,849,376	\$ 2,326,620	\$ (79,334)	\$ 5,096,767
Cumulative-effect adjustment for the adoption of ASU 2016-13	—	—	—	(9,213)	—	(9,213)
Net income	—	—	—	90,704	—	90,704
Other comprehensive loss	—	—	—	—	(4,316)	(4,316)
Common stock issued for share-based compensation	733	1	—	—	—	1
Tax withholding related to vesting of restricted stock	(276)	—	(12,679)	—	—	(12,679)
Share-based compensation expense	—	—	7,358	—	—	7,358
Balance at March 31, 2020	105,906	\$ 106	\$ 2,844,055	\$ 2,408,111	\$ (83,650)	\$ 5,168,622

	Three Months Ended March 31, 2019					
	Common Stock		Additional Paid-In Capital	Accumulated Earnings	Accumulated Other Comprehensive (Loss) Income	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2018	104,885	\$ 105	\$ 2,825,211	\$ 2,441,553	\$ (54,466)	\$ 5,212,403
Net loss	—	—	—	(67,599)	—	(67,599)
Other comprehensive loss	—	—	—	—	(4,547)	(4,547)
Common stock issued for share-based compensation	767	1	—	—	—	1
Tax withholding related to vesting of restricted stock	(299)	(1)	(15,663)	—	—	(15,664)
Share-based compensation expense	—	—	4,567	—	—	4,567
Balance at March 31, 2019	105,353	\$ 105	\$ 2,814,115	\$ 2,373,954	\$ (59,013)	\$ 5,129,161

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,	
	2020	2019
Cash flows from operating activities:		
Net income (loss)	\$ 90,704	\$ (67,599)
Adjustments to reconcile net income (loss) to cash used in operating activities:		
Depreciation, amortization and accretion	56,279	48,872
Impairments and net losses on disposal of long-lived assets	1,288	352
Share-based compensation	7,204	5,019
Equity in earnings, net of tax	88	173
Remeasurement of monetary assets and liabilities	(18)	800
Deferred income taxes	(80,404)	397
Gains on sales of marketable securities and restricted marketable securities	(15,088)	(15,016)
Other, net	16,606	239
Changes in operating assets and liabilities:		
Accounts receivable, trade, unbilled and retainage	242,680	(82,896)
Prepaid expenses and other current assets	(13,387)	(28,400)
Inventories and balance of systems parts	(48,896)	(87,102)
Project assets and PV solar power systems	(50,756)	(73,402)
Other assets	(54,925)	26,481
Income tax receivable and payable	(9,425)	(16,512)
Accounts payable	(38,161)	(15,066)
Accrued expenses and other liabilities	(609,218)	53
Accrued solar module collection and recycling liability	565	167
Net cash used in operating activities	(504,864)	(303,440)
Cash flows from investing activities:		
Purchases of property, plant and equipment	(112,546)	(149,168)
Purchases of marketable securities and restricted marketable securities	(405,794)	(260,715)
Proceeds from sales and maturities of marketable securities and restricted marketable securities	628,936	270,091
Other investing activities	(14,150)	21
Net cash provided by (used in) investing activities	96,446	(139,771)
Cash flows from financing activities:		
Repayment of long-term debt	(325)	(2,703)
Proceeds from borrowings under long-term debt, net of discounts and issuance costs	—	106,503
Payments of tax withholdings for restricted shares	(12,679)	(15,663)
Other financing activities	(436)	(299)
Net cash (used in) provided by financing activities	(13,440)	87,838
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(5,774)	(625)
Net decrease in cash, cash equivalents and restricted cash	(427,632)	(355,998)
Cash, cash equivalents and restricted cash, beginning of the period	1,446,510	1,562,623
Cash, cash equivalents and restricted cash, end of the period	\$ 1,018,878	\$ 1,206,625
Supplemental disclosure of noncash investing and financing activities:		
Property, plant and equipment acquisitions funded by liabilities	\$ 76,298	\$ 135,520

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, 2020 are not necessarily indicative of the results that may be expected for the year ending December 31, 2020 or for any other period. The condensed consolidated balance sheet at December 31, 2019 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, 2019 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. Recent Accounting Pronouncements

In June 2016, the Financial Accounting Standards Board issued Accounting Standards Update (“ASU”) 2016-13, *Financial Instruments – Credit Losses (Topic 326)*, to provide financial statement users with more useful information about expected credit losses. ASU 2016-13 replaces the historical incurred loss model with a model that reflects current expected credit losses (“CECL”), which requires consideration of a broader range of information to measure credit losses and determine the timing of when such losses are recorded. The CECL model is applicable to certain financial assets measured at amortized cost that subject us to credit risk, including cash equivalents, trade accounts receivable, unbilled accounts receivable and retainage, and notes receivable. In addition, ASU 2016-13 amended certain aspects of the accounting for available-for-sale debt securities, including the presentation of credit losses as an allowance against, rather than a write-down of, the fair value of such securities. Furthermore, a credit loss is only considered when a security is in an unrealized loss position, is limited to the difference between such security’s fair value and amortized cost basis, and is recorded directly to “Other (expense) income, net.” Any remaining unrealized loss is recorded to “Accumulated other comprehensive loss” until realized.

We adopted ASU 2016-13 in the first quarter of 2020 using the modified-retrospective approach, which resulted in the recognition of an initial allowance for credit losses for our various financial assets through a cumulative-effect adjustment that decreased retained earnings by \$9.2 million, net of tax, as of January 1, 2020.

The allowance for credit losses is a valuation account that is deducted from a financial asset's amortized cost to present the net amount we expect to collect from such asset. We estimate allowances for credit losses using relevant available information from both internal and external sources. We monitor the estimated credit losses associated with our trade accounts receivable and unbilled accounts receivable based primarily on our collection history and the delinquency status of amounts owed to us, which we determine based on the aging of such receivables. For our notes receivable, we determine estimated credit losses through an assessment of the borrower's credit quality based primarily on quarterly reviews of certain financial information, including financial statements and forecasts. We estimate credit losses associated with our marketable securities and restricted marketable securities based on the external credit rating for such investments and the historical loss rates associated with such credit ratings, which we obtain from third parties. Such methods and estimates are adjusted, as appropriate, for relevant past events, current conditions, such as the COVID-19 pandemic and related containment measures, and reasonable and supportable forecasts. We recognize writeoffs within the allowance for credit losses when cash receipts associated with our financial assets are deemed uncollectible.

See Note 3. "Cash, Cash Equivalents, and Marketable Securities," Note 4. "Restricted Marketable Securities," and Note 5. "Consolidated Balance Sheet Details" to our condensed consolidated financial statements for further information about the allowance for credit losses associated with our various financial assets.

3. Cash, Cash Equivalents, and Marketable Securities

Cash, cash equivalents, and marketable securities consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Cash and cash equivalents:		
Cash	\$ 929,014	\$ 1,345,419
Money market funds	341	7,322
Total cash and cash equivalents	929,355	1,352,741
Marketable securities:		
Foreign debt	292,569	387,820
Foreign government obligations	—	22,011
U.S. debt	54,567	66,134
Time deposits	232,204	335,541
Total marketable securities	579,340	811,506
Total cash, cash equivalents, and marketable securities	\$ 1,508,695	\$ 2,164,247

The following table provides a reconciliation of cash, cash equivalents, and restricted cash reported within our condensed consolidated balance sheets as of March 31, 2020 and December 31, 2019 to the total of such amounts as presented in the condensed consolidated statement of cash flows (in thousands):

	Balance Sheet Line Item	March 31, 2020	December 31, 2019
Cash and cash equivalents	Cash and cash equivalents	\$ 929,355	\$ 1,352,741
Restricted cash – current	Prepaid expenses and other current assets	47,915	13,697
Restricted cash – noncurrent	Other assets	41,608	80,072
Total cash, cash equivalents, and restricted cash		\$ 1,018,878	\$ 1,446,510

During the three months ended March 31, 2020, we sold marketable securities for proceeds of \$130.8 million and realized losses of less than \$0.1 million on such sales. See Note 8. "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, 2020 and December 31, 2019 (in thousands):

	As of March 31, 2020				
	Amortized Cost	Unrealized Gains	Unrealized Losses	Allowance for Credit Losses	Fair Value
Foreign debt	\$ 298,861	\$ 55	\$ 6,250	\$ 97	\$ 292,569
U.S. debt	55,462	58	936	17	54,567
Time deposits	232,305	—	—	101	232,204
Total	\$ 586,628	\$ 113	\$ 7,186	\$ 215	\$ 579,340

	As of December 31, 2019			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Foreign debt	\$ 387,775	\$ 551	\$ 506	\$ 387,820
Foreign government obligations	21,991	20	—	22,011
U.S. debt	65,970	176	12	66,134
Time deposits	335,541	—	—	335,541
Total	\$ 811,277	\$ 747	\$ 518	\$ 811,506

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, 2020 (in thousands):

	Marketable Securities
Balance as of December 31, 2019	\$ —
Cumulative-effect adjustment for the adoption of ASU 2016-13	207
Provision for credit losses	180
Sales and maturities of marketable securities	(172)
Balance as of March 31, 2020	\$ 215

The contractual maturities of our marketable securities as of March 31, 2020 were as follows (in thousands):

	Fair Value
One year or less	\$ 320,765
One year to two years	157,337
Two years to three years	101,238
Total	\$ 579,340

4. Restricted Marketable Securities

Restricted marketable securities consisted of the following as of March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Foreign government obligations	\$ 126,491	\$ 126,066
U.S. government obligations	119,919	97,719
Total restricted marketable securities	<u>\$ 246,410</u>	<u>\$ 223,785</u>

Our restricted marketable securities represent long-term marketable securities held in custodial accounts to fund the estimated future costs of collecting and recycling modules covered under our solar module collection and recycling program. As of March 31, 2020 and December 31, 2019, such custodial accounts also included noncurrent restricted cash balances of \$0.7 million and less than \$0.1 million, respectively, which were reported within “Other assets.” 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. To ensure that amounts previously funded will be available in the future regardless of potential adverse changes in our financial condition (even in the case of our own insolvency), 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. 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.

During the three months ended March 31, 2020, we sold certain restricted marketable securities for proceeds of \$115.2 million, realized gains of \$15.1 million on such sales, and repurchased \$114.5 million of restricted marketable securities as part of our ongoing management of the custodial accounts. During the three months ended March 31, 2019, we sold certain restricted marketable securities for proceeds of \$47.9 million and realized gains of \$15.0 million on such sales as part of efforts to align the currencies of the investments with those of the corresponding collection and recycling liabilities and disbursed \$14.9 million of overfunded amounts. See Note 8. “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, 2020 and December 31, 2019 (in thousands):

	As of March 31, 2020				
	Amortized Cost	Unrealized Gains	Unrealized Losses	Allowance for Credit Losses	Fair Value
Foreign government obligations	\$ 127,528	\$ 133	\$ 1,140	\$ 30	\$ 126,491
U.S. government obligations	114,628	5,291	—	—	119,919
Total	<u>\$ 242,156</u>	<u>\$ 5,424</u>	<u>\$ 1,140</u>	<u>\$ 30</u>	<u>\$ 246,410</u>

	As of December 31, 2019				
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value	
Foreign government obligations	\$ 129,499	\$ —	\$ 3,433	\$ 126,066	
U.S. government obligations	99,700	—	1,981	97,719	
Total	<u>\$ 229,199</u>	<u>\$ —</u>	<u>\$ 5,414</u>	<u>\$ 223,785</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, 2020 (in thousands):

	Restricted Marketable Securities
Balance as of December 31, 2019	\$ —
Cumulative-effect adjustment for the adoption of ASU 2016-13	54
Provision for credit losses	1
Sales of restricted marketable securities	(25)
Balance as of March 31, 2020	<u>\$ 30</u>

As of March 31, 2020, the contractual maturities of our restricted marketable securities were between 10 years and 22 years.

5. Consolidated Balance Sheet Details

Accounts receivable trade, net

Accounts receivable trade, net consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Accounts receivable trade, gross	\$ 293,612	\$ 476,425
Allowance for credit losses	(3,331)	(1,386)
Accounts receivable trade, net	<u>\$ 290,281</u>	<u>\$ 475,039</u>

At March 31, 2020 and December 31, 2019, \$48.1 million and \$44.9 million, respectively, of our trade accounts receivable were secured by letters of credit, bank guarantees, surety bonds, or other forms of financial security issued by creditworthy financial institutions.

Accounts receivable, unbilled and retainage, net

Accounts receivable, unbilled and retainage, net consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Accounts receivable, unbilled	\$ 96,755	\$ 162,057
Retainage	25,577	21,416
Allowance for credit losses	(1,223)	—
Accounts receivable, unbilled and retainage, net	<u>\$ 121,109</u>	<u>\$ 183,473</u>

Allowance for credit losses

The following table presents the change in the allowances for credit losses related to our accounts receivable for the three months ended March 31, 2020 (in thousands):

	Accounts Receivable Trade	Accounts Receivable, Unbilled and Retainage
Balance as of December 31, 2019	\$ (1,386)	\$ —
Cumulative-effect adjustment for the adoption of ASU 2016-13	(171)	(459)
Provision for credit losses, net (1)	(2,026)	(764)
Writeoffs	252	—
Balance as of March 31, 2020	\$ (3,331)	\$ (1,223)

(1) Includes credit losses for accounts receivable trade, net and accounts receivables, unbilled and retainage, net of \$2.2 million and \$0.9 million, respectively, to reflect our estimate of expected credit losses attributable to the current economic conditions resulting from the ongoing COVID-19 pandemic.

Inventories

Inventories consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Raw materials	\$ 255,849	\$ 248,756
Work in process	63,938	59,924
Finished goods	342,264	295,479
Inventories	\$ 662,051	\$ 604,159
Inventories – current	\$ 479,792	\$ 443,513
Inventories – noncurrent	\$ 182,259	\$ 160,646

Prepaid expenses and other current assets

Prepaid expenses and other current assets consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Prepaid expenses	\$ 145,985	\$ 137,927
Prepaid income taxes	51,416	47,811
Restricted cash	47,915	13,697
Indirect tax receivables	29,300	29,908
Derivative instruments (1)	2,846	1,199
Notes receivable, net (2)	—	23,873
Other current assets	25,383	22,040
Prepaid expenses and other current assets	\$ 302,845	\$ 276,455

(1) See Note 6. “Derivative Financial Instruments” to our condensed consolidated financial statements for discussion of our derivative instruments.

(2) In November 2014 and February 2016, we entered into a term loan agreement and a convertible loan agreement, respectively, with Clean Energy Collective, LLC (“CEC”). Our term loan bears interest at 16% per annum, and our convertible loan bears interest at 10% per annum. In November 2018, we amended the terms of the loan agreements to

(i) extend their maturity to June 2020, (ii) waive the conversion features on our convertible loan, and (iii) increase the frequency of interest payments, subject to certain conditions.

We assess CEC's credit quality based primarily on certain quarterly financial information, which was last provided during the three months ended March 31, 2020. As of December 31, 2019, the aggregate balance outstanding on the loans was \$23.9 million. Upon the adoption of ASU 2016-13, we evaluated the estimated credit losses over the remaining contractual term of the loan agreements based on a discounted cash flow model. As a result of this evaluation, we recorded an allowance for credit losses of \$10.8 million as of January 1, 2020. During the three months ended March 31, 2020, we recorded incremental credit losses of \$13.1 million based on our expectation that CEC will be unable to repay the notes by their contractual maturity date due to continued liquidity issues, which have adversely affected CEC's financial condition and results of operations.

Property, plant and equipment, net

Property, plant and equipment, net consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Land	\$ 14,199	\$ 14,241
Buildings and improvements	666,728	664,266
Machinery and equipment	2,168,688	2,436,997
Office equipment and furniture	154,479	159,848
Leasehold improvements	48,744	48,772
Construction in progress	319,787	243,107
Property, plant and equipment, gross	3,372,625	3,567,231
Accumulated depreciation	(1,128,450)	(1,386,082)
Property, plant and equipment, net	<u>\$ 2,244,175</u>	<u>\$ 2,181,149</u>

Depreciation of property, plant and equipment was \$47.4 million and \$42.9 million for the three months ended March 31, 2020 and 2019, respectively.

PV solar power systems, net

Photovoltaic ("PV") solar power systems, net consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
PV solar power systems, gross	\$ 529,396	\$ 530,004
Accumulated depreciation	(58,687)	(53,027)
PV solar power systems, net	<u>\$ 470,709</u>	<u>\$ 476,977</u>

Depreciation of PV solar power systems was \$5.8 million and \$3.5 million for the three months ended March 31, 2020 and 2019, respectively.

Project assets

Project assets consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Project assets – development costs, including project acquisition and land costs	\$ 234,404	\$ 254,466
Project assets – construction costs	154,510	82,654
Project assets	<u>\$ 388,914</u>	<u>\$ 337,120</u>
Project assets – current	\$ 403	\$ 3,524
Project assets – noncurrent	\$ 388,511	\$ 333,596

Capitalized interest

The components of interest expense and capitalized interest were as follows during three months ended March 31, 2020 and 2019 (in thousands):

	Three Months Ended March 31,	
	2020	2019
Interest cost incurred	\$ (7,104)	\$ (10,948)
Interest cost capitalized – project assets	315	827
Interest expense, net	<u>\$ (6,789)</u>	<u>\$ (10,121)</u>

Other assets

Other assets consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Operating lease assets (1)	\$ 160,749	\$ 145,711
Advanced payments for raw materials	105,571	59,806
Restricted cash	41,608	80,072
Indirect tax receivables	10,934	9,446
Notes receivable (2)	8,071	8,194
Income taxes receivable	4,110	4,106
Equity method investments	2,702	2,812
Derivative instruments (3)	746	139
Other	42,763	19,640
Other assets	<u>\$ 377,254</u>	<u>\$ 329,926</u>

(1) See Note 7. “Leases” to our condensed consolidated financial statements for discussion of our lease arrangements.

(2) In April 2009, we entered into a credit facility agreement with a solar power project entity of one of our customers for an available amount of €17.5 million to provide financing for a PV solar power system. The credit facility bears interest at 8.0% per annum, payable quarterly, with the full amount due in December 2026. As of March 31, 2020 and December 31, 2019, the balance outstanding on the credit facility was €7.0 million (\$7.7 million and \$7.8 million, respectively).

We assess the credit quality of the aforementioned customer based primarily on certain quarterly financial information, which was last provided during the three months ended December 31, 2019. Upon adoption of ASU 2016-13, we evaluated the estimated credit losses over the remaining contractual term of the credit facility and determined no

allowance for credit losses was necessary as of January 1, 2020. Additionally, based on the customer's current financial condition and forecasts, we determined no allowance for credit losses was necessary as of March 31, 2020.

(3) See Note 6. "Derivative Financial Instruments" to our condensed consolidated financial statements for discussion of our derivative instruments.

Goodwill

Goodwill for the relevant reporting unit consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	December 31, 2019	Acquisitions (Impairments)	March 31, 2020
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

The following tables summarize our intangible assets at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020		
	Gross Amount	Accumulated Amortization	Net Amount
Developed technology	\$ 99,964	\$ (44,712)	\$ 55,252
Power purchase agreements	6,486	(1,053)	5,433
Patents	7,780	(4,547)	3,233
Intangible assets, net	<u>\$ 114,230</u>	<u>\$ (50,312)</u>	<u>\$ 63,918</u>

	December 31, 2019		
	Gross Amount	Accumulated Amortization	Net Amount
Developed technology	\$ 97,964	\$ (42,344)	\$ 55,620
Power purchase agreements	6,486	(972)	5,514
Patents	7,780	(4,371)	3,409
Intangible assets, net	<u>\$ 112,230</u>	<u>\$ (47,687)</u>	<u>\$ 64,543</u>

Amortization of intangible assets was \$2.6 million and \$2.5 million for the three months ended March 31, 2020 and 2019, respectively.

Accrued expenses

Accrued expenses consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Accrued project costs	\$ 81,461	\$ 91,971
Accrued property, plant and equipment	48,233	42,834
Accrued compensation and benefits	39,625	65,170
Accrued inventory	37,198	39,366
Product warranty liability (1)	20,399	20,291
Other	69,880	91,628
Accrued expenses	<u>\$ 296,796</u>	<u>\$ 351,260</u>

(1) See Note 10. "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, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Operating lease liabilities (1)	\$ 11,824	\$ 11,102
Derivative instruments (2)	1,612	2,582
Contingent consideration (3)	200	2,395
Other	8,149	12,051
Other current liabilities	<u>\$ 21,785</u>	<u>\$ 28,130</u>

(1) See Note 7. "Leases" to our condensed consolidated financial statements for discussion of our lease arrangements.

(2) See Note 6. "Derivative Financial Instruments" to our condensed consolidated financial statements for discussion of our derivative instruments.

(3) See Note 10. "Commitments and Contingencies" to our condensed consolidated financial statements for discussion of our "Contingent Consideration" arrangements.

Other liabilities

Other liabilities consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

	March 31, 2020	December 31, 2019
Operating lease liabilities (1)	\$ 125,253	\$ 112,515
Product warranty liability (2)	104,102	109,506
Other taxes payable	92,519	90,201
Transition tax liability	70,047	70,047
Deferred revenue	69,505	71,438
Derivative instruments (3)	9,544	7,439
Contingent consideration (2)	4,500	4,500
Other	44,017	43,120
Other liabilities	<u>\$ 519,487</u>	<u>\$ 508,766</u>

- (1) See Note 7. “Leases” to our condensed consolidated financial statements for discussion of our lease arrangements.
- (2) See Note 10. “Commitments and Contingencies” to our condensed consolidated financial statements for discussion of our “Product Warranties” and “Contingent Consideration” arrangements.
- (3) See Note 6. “Derivative Financial Instruments” to our condensed consolidated financial statements for discussion of our derivative instruments.

6. Derivative Financial Instruments

As a global company, we are exposed in the normal course of business to interest rate and foreign currency 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 8. “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, 2020 and December 31, 2019 (in thousands):

	March 31, 2020			
	Prepaid Expenses and Other Current Assets	Other Assets	Other Current Liabilities	Other Liabilities
Derivatives designated as hedging instruments:				
Foreign exchange forward contracts	\$ 528	\$ 746	\$ 29	\$ —
Total derivatives designated as hedging instruments	\$ 528	\$ 746	\$ 29	\$ —
Derivatives not designated as hedging instruments:				
Foreign exchange forward contracts	\$ 2,318	\$ —	\$ 1,108	\$ —
Interest rate swap contracts	—	—	475	9,544
Total derivatives not designated as hedging instruments	\$ 2,318	\$ —	\$ 1,583	\$ 9,544
Total derivative instruments	\$ 2,846	\$ 746	\$ 1,612	\$ 9,544

	December 31, 2019			
	Prepaid Expenses and Other Current Assets	Other Assets	Other Current Liabilities	Other Liabilities
Derivatives designated as hedging instruments:				
Foreign exchange forward contracts	\$ 226	\$ 139	\$ 369	\$ 230
Total derivatives designated as hedging instruments	<u>\$ 226</u>	<u>\$ 139</u>	<u>\$ 369</u>	<u>\$ 230</u>
Derivatives not designated as hedging instruments:				
Foreign exchange forward contracts	\$ 973	\$ —	\$ 1,807	\$ —
Interest rate swap contracts	—	—	406	7,209
Total derivatives not designated as hedging instruments	<u>\$ 973</u>	<u>\$ —</u>	<u>\$ 2,213</u>	<u>\$ 7,209</u>
Total derivative instruments	<u>\$ 1,199</u>	<u>\$ 139</u>	<u>\$ 2,582</u>	<u>\$ 7,439</u>

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, 2020 and 2019 (in thousands):

	Foreign Exchange Forward Contracts
Balance as of December 31, 2019	\$ (962)
Amounts recognized in other comprehensive income (loss)	768
Amounts reclassified to earnings impacting:	
Cost of sales	207
Balance as of March 31, 2020	<u>\$ 13</u>
Balance as of December 31, 2018	\$ 1,329
Amounts recognized in other comprehensive income (loss)	(31)
Balance as of March 31, 2019	<u>\$ 1,298</u>

During the three months ended March 31, 2020, we recognized unrealized gains of \$0.8 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 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, 2020 and 2019 (in thousands):

	Income Statement Line Item	Amount of Gain (Loss) Recognized in Income	
		Three Months Ended March 31,	
		2020	2019
Foreign exchange forward contracts	Cost of sales	\$ 106	\$ —
Foreign exchange forward contracts	Foreign currency (loss) income, net	(275)	1,900
Interest rate swap contracts	Interest expense, net	(2,404)	(5,364)

Interest Rate Risk

We use interest rate swap contracts to mitigate our exposure to interest rate fluctuations associated with certain of our debt instruments. We do not use such swap contracts for speculative or trading purposes. During the three months ended March 31, 2020 and 2019, all of our interest rate swap contracts related to project specific debt facilities. Such swap contracts did not qualify for accounting as cash flow hedges in accordance with Accounting Standards Codification (“ASC”) 815 due to our expectation to sell the associated projects before the maturity of their project specific debt financings and corresponding swap contracts. Accordingly, changes in the fair values of these swap contracts were recorded directly to “Interest expense, net.”

In December 2019, FS Japan Project 31 GK, our indirectly wholly-owned subsidiary and project company, entered into an interest rate swap contract to hedge a portion of the floating rate term loan facility under the project’s Anamizu Credit Agreement (as defined in Note 9. “Debt” to our consolidated financial statements). Such swap had an initial notional value of ¥0.9 billion and entitled the project to receive a six-month floating Tokyo Interbank Offered Rate (“TIBOR”) plus 0.70% interest rate while requiring the project to pay a fixed rate of 1.1925%. The notional amount of the interest rate swap contract proportionately adjusts with scheduled draws and principal payments on the underlying hedged debt. As of March 31, 2020 and December 31, 2019, the notional value of the interest rate swap contract was ¥1.4 billion (\$12.6 million) and ¥0.9 billion (\$8.0 million), respectively.

In January 2017, FS Japan Project 12 GK, our indirect wholly-owned subsidiary and project company, entered into an interest rate swap contract to hedge a portion of the floating rate senior loan facility under the project’s Ishikawa Credit Agreement (as defined in Note 9. “Debt” to our condensed consolidated financial statements). Such swap had an initial notional value of ¥5.7 billion and entitled the project to receive a six-month floating TIBOR plus 0.75% interest rate while requiring the project to pay a fixed rate of 1.482%. The notional amount of the interest rate swap contract proportionately adjusts with scheduled draws and principal payments on the underlying hedged debt. As of March 31, 2020 and December 31, 2019, the notional value of the interest rate swap contract was ¥18.7 billion (\$173.2 million) and ¥18.7 billion (\$171.7 million), respectively.

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. As of March 31, 2020 and December 31, 2019, these foreign exchange forward contracts hedged our forecasted cash flows for periods up to 19 months and 22 months, respectively. These foreign exchange forward 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 transaction occurs and impacts earnings. We determined that these derivative financial instruments were highly effective as cash flow hedges as of March 31, 2020 and December 31, 2019.

As of March 31, 2020 and December 31, 2019, the notional values associated with our foreign exchange forward contracts qualifying as cash flow hedges were as follows (notional amounts and U.S. dollar equivalents in millions):

Currency	March 31, 2020	
	Notional Amount	USD Equivalent
U.S. dollar (1)	\$66.2	\$66.2

Currency	December 31, 2019	
	Notional Amount	USD Equivalent
U.S. dollar (1)	\$69.9	\$69.9

(1) These derivative instruments represent hedges of outstanding payables denominated in U.S. dollars at certain of our foreign subsidiaries whose functional currencies are other than the U.S. dollar.

In the following 12 months, we expect to reclassify to earnings \$0.1 million of net unrealized gains related to forward contracts that are included in “Accumulated other comprehensive loss” at March 31, 2020 as we realize the earnings effects of the related forecasted transactions. The amount we ultimately record to earnings will depend on the actual exchange rates when we realize the related forecasted transactions.

Transaction Exposure and Economic Hedging

Many of our subsidiaries have assets and liabilities (primarily cash, receivables, deferred taxes, payables, accrued expenses, 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) income, net” on our condensed consolidated statements of operations.

As of March 31, 2020 and December 31, 2019, 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	March 31, 2020		
	Currency	Notional Amount	USD Equivalent
Purchase	Australian dollar	AUD 14.6	\$9.0
Sell	Australian dollar	AUD 12.1	\$7.4
Purchase	Brazilian real	BRL 2.6	\$0.5
Sell	Brazilian real	BRL 4.3	\$0.8
Sell	Canadian dollar	CAD 4.3	\$3.0
Sell	Chilean peso	CLP 3,679.1	\$4.3
Purchase	Euro	€88.3	\$97.4
Sell	Euro	€47.4	\$52.3
Purchase	Indian rupee	INR 470.9	\$6.2
Sell	Indian rupee	INR 1,349.2	\$17.8
Purchase	Japanese yen	¥2,496.3	\$23.1
Sell	Japanese yen	¥22,990.4	\$213.1
Purchase	Malaysian ringgit	MYR 89.1	\$20.5
Sell	Malaysian ringgit	MYR 36.3	\$8.4
Sell	Mexican peso	MXN 34.6	\$1.4
Purchase	Singapore dollar	SGD 2.9	\$2.0

Transaction	December 31, 2019		
	Currency	Notional Amount	USD Equivalent
Purchase	Australian dollar	AUD 14.9	\$10.4
Sell	Australian dollar	AUD 11.1	\$7.8
Purchase	Brazilian real	BRL 13.2	\$3.3
Sell	Brazilian real	BRL 4.3	\$1.1
Purchase	Canadian dollar	CAD 4.5	\$3.4
Sell	Canadian dollar	CAD 1.6	\$1.2
Purchase	Chilean peso	CLP 1,493.1	\$2.0
Sell	Chilean peso	CLP 3,866.1	\$5.1
Purchase	Euro	€86.1	\$96.5
Sell	Euro	€116.3	\$130.3
Sell	Indian rupee	INR 1,283.8	\$18.0
Purchase	Japanese yen	¥3,625.5	\$33.3
Sell	Japanese yen	¥23,089.5	\$212.2
Purchase	Malaysian ringgit	MYR 88.6	\$21.6
Sell	Malaysian ringgit	MYR 41.3	\$10.1
Sell	Mexican peso	MXN 34.6	\$1.8
Purchase	Singapore dollar	SGD 2.9	\$2.2

7. Leases

Our lease arrangements include land associated with our systems projects, 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, Japan, Malaysia, and Vietnam.

The following table presents certain quantitative information related to our lease arrangements for the three months ended March 31, 2020 and 2019, and as of March 31, 2020 and December 31, 2019 (in thousands):

	Three Months Ended March 31,	
	2020	2019
Operating lease cost	\$ 4,178	\$ 5,283
Variable lease cost	666	749
Short-term lease cost	961	2,842
Total lease cost	<u>\$ 5,805</u>	<u>\$ 8,874</u>
Payments of amounts included in the measurement of operating lease liabilities	\$ 4,897	\$ 4,947
Lease assets obtained in exchange for operating lease liabilities	\$ 17,576	\$ 149,631
	March 31, 2020	December 31, 2019
Operating lease assets	\$ 160,749	\$ 145,711
Operating lease liabilities – current	11,824	11,102
Operating lease liabilities – noncurrent	125,253	112,515
Weighted-average remaining lease term	16 years	15 years
Weighted-average discount rate	4.0 %	4.3 %

As of March 31, 2020, the future payments associated with our lease liabilities were as follows (in thousands):

	Total Lease Liabilities
Remainder of 2020	\$ 11,534
2021	15,473
2022	14,507
2023	14,017
2024	13,731
Thereafter	108,763
Total future payments	<u>178,025</u>
Less: interest	(40,948)
Total lease liabilities	<u>\$ 137,077</u>

8. 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.* At March 31, 2020 and December 31, 2019, our cash equivalents consisted of money market funds. We value our cash equivalents using observable inputs that reflect quoted prices for securities with identical characteristics, and accordingly, we classify the valuation techniques that use these inputs as Level 1.
- *Marketable Securities and Restricted Marketable Securities.* At March 31, 2020 and December 31, 2019, our marketable securities consisted of foreign debt, foreign government obligations, U.S. debt, and time deposits, and our restricted marketable securities consisted of foreign and U.S. government obligations. 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, 2020 and December 31, 2019, our derivative assets and liabilities consisted of foreign exchange forward contracts involving major currencies and interest rate swap contracts involving major interest rates. 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 interest rate curves, credit risk, foreign exchange rates, and forward and spot prices for currencies. 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, 2020 and December 31, 2019, 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			
	March 31, 2020	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash equivalents:				
Money market funds	\$ 341	\$ 341	\$ —	\$ —
Marketable securities:				
Foreign debt	292,569	—	292,569	—
U.S. debt	54,567	—	54,567	—
Time deposits	232,204	232,204	—	—
Restricted marketable securities	246,410	—	246,410	—
Derivative assets	3,592	—	3,592	—
Total assets	\$ 829,683	\$ 232,545	\$ 597,138	\$ —
Liabilities:				
Derivative liabilities	\$ 11,156	\$ —	\$ 11,156	\$ —

	Fair Value Measurements at Reporting Date Using			
	December 31, 2019	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash equivalents:				
Money market funds	\$ 7,322	\$ 7,322	\$ —	\$ —
Marketable securities:				
Foreign debt	387,820	—	387,820	—
Foreign government obligations	22,011	—	22,011	—
U.S. debt	66,134	—	66,134	—
Time deposits	335,541	335,541	—	—
Restricted marketable securities	223,785	—	223,785	—
Derivative assets	1,338	—	1,338	—
Total assets	<u>\$ 1,043,951</u>	<u>\$ 342,863</u>	<u>\$ 701,088</u>	<u>\$ —</u>
Liabilities:				
Derivative liabilities	<u>\$ 10,021</u>	<u>\$ —</u>	<u>\$ 10,021</u>	<u>\$ —</u>

Fair Value of Financial Instruments

At March 31, 2020 and December 31, 2019, the carrying values and fair values of our financial instruments not measured at fair value were as follows (in thousands):

	March 31, 2020		December 31, 2019	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Assets:				
Notes receivable – current (1)	\$ —	\$ —	\$ 23,873	\$ 24,929
Notes receivable – noncurrent (1)	8,071	8,699	8,194	10,276
Liabilities:				
Long-term debt, including current maturities (2)	\$ 483,395	\$ 458,336	\$ 482,892	\$ 504,213

(1) See Note 5. “Consolidated Balance Sheet Details” for further information about the allowance for credit losses for our notes receivable.

(2) Excludes unamortized discounts and issuance costs.

The carrying values in our condensed consolidated balance sheets of our trade accounts receivable, unbilled accounts receivable and retainage, 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 notes 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 marketable securities, notes receivable, and foreign exchange forward contracts. We are exposed to credit losses in the event of nonperformance by the counterparties to our financial and derivative instruments. We place cash, cash equivalents, marketable

securities, restricted cash and marketable securities, and foreign exchange forward contracts with various high-quality financial institutions and limit the amount of credit risk from any one counterparty. We continuously evaluate 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. Depending upon the sales arrangement, we may require some form of payment security from our customers, including advance payments, parent guarantees, letters of credit, bank guarantees, or surety bonds. We also have power purchase agreements (“PPAs”) that subject us to credit risk in the event our off-take counterparties are unable to fulfill their contractual obligations, which may adversely affect our project assets and certain receivables. Accordingly, we closely monitor the credit standing of existing and potential off-take counterparties to limit such risks.

9. Debt

Our long-term debt consisted of the following at March 31, 2020 and December 31, 2019 (in thousands):

Loan Agreement	Currency	Balance (USD)	
		March 31, 2020	December 31, 2019
Revolving Credit Facility	USD	\$ —	\$ —
Luz del Norte Credit Facilities	USD	187,958	188,017
Ishikawa Credit Agreement	JPY	217,811	215,879
Japan Credit Facility	JPY	1,693	1,678
Tochigi Credit Facility	JPY	37,638	37,304
Anamizu Credit Agreement	JPY	12,246	12,138
Anantapur Credit Facility	INR	14,010	15,123
Tungabhadra Credit Facility	INR	12,039	12,753
Long-term debt principal		483,395	482,892
Less: unamortized discounts and issuance costs		(11,000)	(11,195)
Total long-term debt		472,395	471,697
Less: current portion		(81,807)	(17,510)
Noncurrent portion		\$ 390,588	\$ 454,187

Revolving Credit Facility

Our amended and restated credit agreement with several financial institutions as lenders and JPMorgan Chase Bank, N.A. as administrative agent provides us with a senior secured credit facility (the “Revolving Credit Facility”) with an aggregate borrowing capacity of \$500.0 million, which we may increase to \$750.0 million, subject to certain conditions. Borrowings under the credit facility bear interest at (i) London Interbank Offered Rate (“LIBOR”), adjusted for Eurocurrency reserve requirements, plus a margin of 2.00% or (ii) a base rate as defined in the credit agreement plus a margin of 1.00% depending on the type of borrowing requested. These margins are also subject to adjustment depending on our consolidated leverage ratio. We had no borrowings under our Revolving Credit Facility as of March 31, 2020 and December 31, 2019 and had issued \$14.2 million and \$39.3 million, respectively, of letters of credit using availability under the facility. Loans and letters of credit issued under the Revolving Credit Facility are jointly and severally guaranteed by First Solar, Inc.; First Solar Electric, LLC; First Solar Electric (California), Inc.; and First Solar Development, LLC and are secured by interests in substantially all of the guarantors’ tangible and intangible assets other than certain excluded assets.

In addition to paying interest on outstanding principal under the Revolving Credit Facility, we are required to pay a commitment fee at a rate of 0.30% per annum, based on the average daily unused commitments under the facility, which may also be adjusted due to changes in our consolidated leverage ratio. We also pay a letter of credit fee based on the applicable margin for Eurocurrency revolving loans on the face amount of each letter of credit and a fronting fee of 0.125%. Our Revolving Credit Facility matures in July 2022.

Luz del Norte Credit Facilities

In August 2014, Parque Solar Fotovoltaico Luz del Norte SpA (“Luz del Norte”), our indirect wholly-owned subsidiary and project company, entered into credit facilities (the “Luz del Norte Credit Facilities”) with the U.S. International Development Finance Corporation (“DFC”) and the International Finance Corporation (“IFC”) to provide limited-recourse senior secured debt financing for the design, development, financing, construction, testing, commissioning, operation, and maintenance of a 141 MW_{AC} PV solar power plant located near Copiapó, Chile.

In March 2017, we amended the terms of the DFC and IFC credit facilities. Such amendments (i) allowed for the capitalization of accrued and unpaid interest through March 15, 2017, along with the capitalization of certain future interest payments as variable rate loans under the credit facilities, (ii) allowed for the conversion of certain fixed rate loans to variable rate loans upon scheduled repayment, (iii) extended the maturity of the DFC and IFC loans until June 2037, and (iv) canceled the remaining borrowing capacity under the DFC and IFC credit facilities with the exception of the capitalization of certain future interest payments. As of March 31, 2020 and December 31, 2019, the balance outstanding on the DFC loans was \$140.8 million. As of March 31, 2020 and December 31, 2019, the balance outstanding on the IFC loans was \$47.2 million. The DFC and IFC loans are secured by liens over all of Luz del Norte’s assets and by a pledge of all of the equity interests in the entity.

Ishikawa Credit Agreement

In December 2016, FS Japan Project 12 GK (“Ishikawa”), our indirect wholly-owned subsidiary and project company, entered into a credit agreement (the “Ishikawa Credit Agreement”) with Mizuho Bank, Ltd. for aggregate borrowings up to ¥27.3 billion (\$233.9 million) for the development and construction of a 59 MW_{AC} PV solar power plant located in Ishikawa, Japan. The credit agreement consists of a ¥24.0 billion (\$205.6 million) senior loan facility, a ¥2.1 billion (\$18.0 million) consumption tax facility, and a ¥1.2 billion (\$10.3 million) letter of credit facility. The senior loan facility matures in October 2036, and the consumption tax facility matures in April 2020. The credit agreement is secured by pledges of Ishikawa’s assets, accounts, material project documents, and by the equity interests in the entity. As of March 31, 2020 and December 31, 2019, the balance outstanding on the credit agreement was \$217.8 million and \$215.9 million, respectively.

Japan Credit Facility

In September 2015, First Solar Japan GK, our wholly-owned subsidiary, entered into a construction loan facility with Mizuho Bank, Ltd. for borrowings up to ¥4.0 billion (\$33.4 million) for the development and construction of utility-scale PV solar power plants in Japan (the “Japan Credit Facility”). Borrowings under the facility generally mature within 12 months following the completion of construction activities for each financed project. The facility is guaranteed by First Solar, Inc. and secured by pledges of certain projects’ cash accounts and other rights in the projects. As of March 31, 2020 and December 31, 2019, the balance outstanding on the facility was \$1.7 million.

Tochigi Credit Facility

In June 2017, First Solar Japan GK, our wholly-owned subsidiary, entered into a term loan facility with Mizuho Bank, Ltd. for borrowings up to ¥7.0 billion (\$62.2 million) for the development of utility-scale PV solar power plants in Japan (the “Tochigi Credit Facility”). The term loan facility matures in March 2021. The facility is guaranteed by First Solar, Inc. and secured by pledges of certain of First Solar Japan GK’s accounts. As of March 31, 2020 and December 31, 2019, the balance outstanding on the term loan facility was \$37.6 million and \$37.3 million, respectively.

Anamizu Credit Agreement

In December 2019, FS Japan Project 31 GK (“Anamizu”), our indirect wholly-owned subsidiary and project company, entered into a credit agreement (the “Anamizu Credit Agreement”) with MUFG Bank, Ltd.; The Iyo Bank, Ltd.; The Hachijuni Bank, Ltd.; The Hyakugo Bank, Ltd.; and The Yamagata Bank, Ltd. for aggregate borrowings up to ¥7.7 billion (\$70.8 million) for the development and construction of a 17 MW_{AC} PV solar power plant located in Ishikawa, Japan. The credit agreement consists of a ¥6.6 billion (\$61.0 million) term loan facility, a ¥0.7 billion (\$6.5 million) consumption tax facility, and a ¥0.4 billion (\$3.3 million) debt service reserve facility. The term loan facility matures in September 2038, the consumption tax facility matures in November 2022, and the debt service reserve facility matures in March 2038. The credit agreement is secured by pledges of Anamizu’s assets, accounts, material project documents, and by the equity interests in the entity. As of March 31, 2020 and December 31, 2019, the balance outstanding on the credit agreement was \$12.2 million and \$12.1 million, respectively.

Anantapur Credit Facility

In March 2018, Anantapur Solar Parks Private Limited, our indirect wholly-owned subsidiary and project company, entered into a term loan facility (the “Anantapur Credit Facility”) with J.P. Morgan Securities India Private Limited for borrowings up to INR 1.2 billion (\$18.4 million) for costs related to a 20 MW_{AC} PV solar power plant located in Karnataka, India. The term loan facility matures in February 2021 and is secured by a letter of credit issued by JPMorgan Chase Bank, N.A., Singapore, in favor of the lender. Such letter of credit is secured by a cash deposit placed by First Solar FE Holdings Pte. Ltd. As of March 31, 2020 and December 31, 2019, the balance outstanding on the term loan facility was \$14.0 million and \$15.1 million, respectively.

Tungabhadra Credit Facility

In March 2018, Tungabhadra Solar Parks Private Limited, our indirect wholly-owned subsidiary and project company, entered into a term loan facility (the “Tungabhadra Credit Facility”) with J.P. Morgan Securities India Private Limited for borrowings up to INR 1.0 billion (\$15.3 million) for costs related to a 20 MW_{AC} PV solar power plant located in Karnataka, India. The term loan facility matures in February 2021 and is secured by a letter of credit issued by JPMorgan Chase Bank, N.A., Singapore, in favor of the lender. Such letter of credit is secured by a cash deposit placed by First Solar FE Holdings Pte. Ltd. As of March 31, 2020 and December 31, 2019, the balance outstanding on the term loan facility was \$12.0 million and \$12.8 million, respectively.

Variable Interest Rate Risk

Certain of our long-term debt agreements bear interest at prime, LIBOR, TIBOR, BBSY, or equivalent variable rates. An increase in these variable rates would increase the cost of borrowing under our Revolving Credit Facility and certain project specific debt financings. Our long-term debt borrowing rates as of March 31, 2020 were as follows:

Loan Agreement	March 31, 2020
Revolving Credit Facility	2.99%
Luz del Norte Credit Facilities (1)	Fixed rate loans at bank rate plus 3.50% Variable rate loans at 91-Day U.S. Treasury Bill Yield or LIBOR plus 3.50%
Ishikawa Credit Agreement	Senior loan facility at 6-month TIBOR plus 0.75% (2) Consumption tax facility at 3-month TIBOR plus 0.5%
Japan Credit Facility	1-month TIBOR plus 0.55%
Tochigi Credit Facility	3-month TIBOR plus 1.0%
Anamizu Credit Agreement	Term loan facility at 6-month TIBOR plus 0.70% (2) Consumption tax facility at 3-month TIBOR plus 0.5% Debt service reserve facility at 6-month TIBOR plus 1.20%
Anantapur Credit Facility	INR overnight indexed swap rate plus 1.5%
Tungabhadra Credit Facility	INR overnight indexed swap rate plus 1.5%

(1) Outstanding balance comprised of \$152.2 million of fixed rate loans and \$35.8 million of variable rate loans as of March 31, 2020.

(2) We have entered into interest rate swap contracts to hedge portions of these variable rates. See Note 6. "Derivative Financial Instruments" to our condensed consolidated financial statements for additional information.

Future Principal Payments

At March 31, 2020, the future principal payments on our long-term debt were due as follows (in thousands):

	Total Debt
Remainder of 2020	\$ 17,767
2021	77,917
2022	19,401
2023	18,393
2024	19,321
Thereafter	330,596
Total long-term debt future principal payments	\$ 483,395

10. Commitments and Contingencies

Commercial Commitments

During the normal course of business, we enter into commercial commitments in the form of letters of credit, bank guarantees, and surety bonds to provide financial and performance assurance to third parties. Our amended and restated Revolving Credit Facility provides us with a sub-limit of \$400.0 million to issue letters of credit, subject to certain additional limits depending on the currencies of the letters of credit, at a fee based on the applicable margin for Eurocurrency revolving loans and a fronting fee. As of March 31, 2020, we had \$14.2 million in letters of credit issued under our Revolving Credit Facility, leaving \$385.8 million of availability for the issuance of additional letters of credit. As of March 31, 2020, we also had \$9.9 million of letters of credit under separate agreements that

were posted by certain of our foreign subsidiaries and \$148.8 million of letters of credit issued under three bilateral facilities, of which \$30.0 million was secured with cash, leaving \$614.9 million of aggregate available capacity under such agreements and facilities. We also had \$89.0 million of surety bonds outstanding, leaving \$626.4 million of available bonding capacity under our surety lines as of March 31, 2020. The majority of these letters of credit and surety bonds supported our systems projects.

Product Warranties

When we recognize revenue for module or system sales, we accrue liabilities for the estimated future costs of meeting our limited warranty obligations for both modules and the balance of the systems. 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, 2020 and 2019 were as follows (in thousands):

	Three Months Ended March 31,	
	2020	2019
Product warranty liability, beginning of period	\$ 129,797	\$ 220,692
Accruals for new warranties issued	2,285	5,116
Settlements	(6,562)	(3,078)
Changes in estimate of product warranty liability	(1,019)	(5,489)
Product warranty liability, end of period	<u>\$ 124,501</u>	<u>\$ 217,241</u>
Current portion of warranty liability	\$ 20,399	\$ 31,013
Noncurrent portion of warranty liability	\$ 104,102	\$ 186,228

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. In general, we expect the return rates for our newer series of module technology to be lower than our older series. We estimate that the return rate for such newer series of module technology will be less than 1%. As of March 31, 2020, a 1% increase in the return rate across all series of module technology would increase our product warranty liability by \$94.5 million, and a 1% increase in the return rate for balance of systems (“BoS”) parts would not have a material impact on the associated warranty liability.

Performance Guarantees

As part of our systems business, we conduct performance testing of a system prior to substantial completion to confirm the system meets its operational and capacity expectations noted in the engineering, procurement, and construction (“EPC”) agreement. In addition, we may provide an energy performance test during the first or second year of a system’s operation to demonstrate that the actual energy generation for the applicable period meets or exceeds the modeled energy expectation, after certain adjustments. If there is an underperformance event with regards to these tests, we may incur liquidated damages as specified in the EPC agreement. In certain instances, a bonus payment may be received at the end of the applicable test period if the system performs above a specified level. As of March 31, 2020 and December 31, 2019, we accrued \$5.1 million and \$4.6 million, respectively, for our estimated obligations under such arrangements, which were classified as “Other current liabilities” in our condensed consolidated balance sheets.

As part of our operations and maintenance (“O&M”) service offerings, we typically offer an effective availability guarantee, which stipulates that a system will be available to generate a certain percentage of total possible energy during a specific period after adjusting for factors outside our control as the service provider, such as weather, curtailment, outages, force majeure, and other conditions that may affect system availability. Effective availability guarantees are only offered as part of our O&M services and terminate at the end of an O&M arrangement. If we fail to meet the contractual threshold for these guarantees, we may incur liquidated damages for certain lost energy. Our O&M agreements typically contain provisions limiting our total potential losses under an agreement, including amounts paid for liquidated damages, to a percentage of O&M fees. Many of our O&M agreements also contain provisions whereby we may receive a bonus payment if system availability exceeds a separate threshold. As of March 31, 2020 and December 31, 2019, we accrued \$0.5 million and \$0.6 million, respectively, of liquidated damages under our effective availability guarantees, which were classified as “Other current liabilities” in our condensed consolidated balance sheets.

Indemnifications

In certain limited circumstances, we have provided indemnifications to customers, including project tax equity investors, under which we are contractually obligated to compensate such parties for losses they suffer resulting from a breach of a representation, warranty, or covenant or a reduction in tax benefits received, including investment tax credits. Project related tax benefits are, in part, based on guidance provided by the Internal Revenue Service and U.S. Treasury Department, which includes assumptions regarding the fair value of qualifying PV solar power systems. For any sales 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 typically base these estimates on the cost of insurance policies that cover the underlying risks being indemnified and may purchase such policies 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 revenue in the related transaction.

After an indemnification liability is recorded, we derecognize such amount pursuant to ASC 460-10-35-2 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. We accrued \$0.8 million of current indemnification liabilities as of December 31, 2019 and \$4.2 million of noncurrent indemnification liabilities as of March 31, 2020 and December 31, 2019. As of March 31, 2020, the maximum potential amount of future payments under our tax related and other indemnifications was \$152.8 million, and we held insurance policies allowing us to recover up to \$84.9 million of potential amounts paid under the indemnifications covered by the policies.

Contingent Consideration

We may seek to make additions to our advanced-stage project pipeline by actively developing our early-to-mid-stage project pipeline and by pursuing opportunities to acquire projects at various stages of development. In connection with such project acquisitions, we may agree to pay additional amounts to project sellers upon the achievement of certain milestones, such as obtaining a PPA, obtaining financing, or selling the project to a new owner. We recognize a project acquisition contingent liability when we determine that such a liability is both probable and reasonably estimable, and the carrying amount of the related project asset is correspondingly increased. As of March 31, 2020 and December 31, 2019, we accrued \$0.2 million and \$2.4 million of current liabilities, respectively, and \$4.5 million of long-term liabilities for project related contingent obligations. Any future differences between the acquisition-date contingent obligation estimate and the ultimate settlement of the obligation are recognized as an adjustment to the project asset, as contingent payments are considered direct and incremental to the underlying value of the related project.

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 were 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 probability-weighted 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; by-product credits for certain materials recovered during the recycling process; and an estimated third-party profit margin and return on risk for collection and recycling services. 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 by applying the discount rate used for its initial measurement. We classify accretion as an operating expense within "Selling, general and administrative" expense on our condensed consolidated statements of operations.

Our module collection and recycling liability was \$138.0 million and \$137.8 million as of March 31, 2020 and December 31, 2019, respectively. As of March 31, 2020, a 1% increase in the annualized inflation rate used in our estimated future collection and recycling cost per module would increase the liability by \$25.4 million, and a 1% decrease in that rate would decrease the liability by \$22.3 million. 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 March 15, 2012, a purported class action lawsuit titled *Smilovits v. First Solar, Inc., et al.*, Case No. 2:12-cv-00555-DGC, 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 and former directors and officers. The complaint was filed on behalf of persons who purchased or otherwise acquired the Company's publicly traded securities between April 30, 2008 and February 28, 2012 (the "Class Action"). The complaint generally alleged that the defendants violated Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 by making false and misleading statements regarding the Company's financial performance and prospects. The action included claims for damages, including interest, and an award of reasonable costs and attorneys' fees to the putative class.

On July 23, 2012, the Arizona District Court issued an order appointing as lead plaintiffs in the Class Action the Mineworkers' Pension Scheme and British Coal Staff Superannuation Scheme (collectively, the "Pension Schemes"). The Pension Schemes filed an amended complaint on August 17, 2012, which contains similar allegations and seeks similar relief as the original complaint. Defendants filed a motion to dismiss on September 14, 2012. On December 17, 2012, the court denied defendants' motion to dismiss. On October 8, 2013, the Arizona District Court granted the Pension Schemes' motion for class certification and certified a class comprised of all persons who purchased or otherwise acquired publicly traded securities of the Company between April 30, 2008 and February 28, 2012 and were damaged thereby, excluding defendants and certain related parties. Merits discovery closed on February 27, 2015.

Defendants filed a motion for summary judgment on March 27, 2015. On August 11, 2015, the Arizona District Court granted defendants' motion in part and denied it in part, and certified an issue for immediate appeal to the Ninth Circuit Court of Appeals (the "Ninth Circuit"). First Solar filed a petition for interlocutory appeal with the Ninth Circuit, and that petition was granted on November 18, 2015. On May 20, 2016, the Pension Schemes moved to vacate the order granting the petition, dismiss the appeal, and stay the merits briefing schedule. On December 13, 2016, the Ninth Circuit denied the Pension Schemes' motion. On January 31, 2018, the Ninth Circuit issued an opinion affirming the Arizona District Court's order denying in part defendants' motion for summary judgment. On March 16, 2018, First Solar filed a petition for panel rehearing or rehearing en banc with the Ninth Circuit. On May 7, 2018, the Ninth Circuit denied defendants' petition. On August 6, 2018, defendants filed a petition for writ of certiorari to the U.S. Supreme Court. Meanwhile, in the Arizona District Court, expert discovery was completed on February 5, 2019. On June 24, 2019, the U.S. Supreme Court denied the petition. Following the denial of the petition, the Arizona District Court ordered that the trial begin on January 7, 2020.

On January 5, 2020, First Solar entered into a Memorandum of Understanding ("MOU") to settle the Class Action. First Solar agreed to pay a total of \$350 million to settle the claims in the Class Action brought on behalf of all persons who purchased or otherwise acquired the Company's shares between April 30, 2008 and February 28, 2012, in exchange for mutual releases and a dismissal with prejudice of the complaint upon court approval of the settlement. The proposed settlement contains no admission of liability, wrongdoing, or responsibility by any of the parties. As a result of the entry into the MOU, we accrued a loss for the above-referenced settlement in our results of operations for the year ended December 31, 2019. On January 24, 2020, First Solar paid \$350 million to the settlement escrow agent. On February 13, 2020, First Solar entered into a stipulation of settlement with certain named plaintiffs on terms and conditions that are consistent with the MOU. On February 14, 2020, the lead plaintiffs filed a motion for preliminary approval of the settlement. Following a February 27, 2020 hearing, the Arizona District Court entered an order on March 2, 2020 that granted preliminary approval of the settlement and permitted notice to the class. Under that order, among other matters, written objections from any objectors are due by June 9, 2020 and a final approval hearing is scheduled for June 30, 2020.

Opt-Out Action

On June 23, 2015, a suit titled *Maverick Fund, L.D.C. v. First Solar, Inc., et al.*, Case No. 2:15-cv-01156-ROS, was filed in Arizona District Court by putative stockholders that opted out of the Class Action. The complaint names the Company and certain of our current and former directors and officers as defendants, and alleges that the defendants violated Sections 10(b) and 20(a) of the Securities Exchange Act of 1934, and violated state law, by making false and misleading statements regarding the Company's financial performance and prospects. The action includes claims for rescissory and actual damages, interest, punitive damages, and an award of reasonable attorneys' fees, expert fees, and costs. The Company is vigorously defending this action.

First Solar and the individual defendants filed a motion to dismiss the complaint on July 16, 2018. On November 27, 2018, the Court granted defendants' motion to dismiss the plaintiffs' negligent misrepresentation claim under state law, but otherwise denied defendants' motion. The plaintiffs have argued that the action is unique from the Class Action and have sought additional discovery. Following an April 7, 2020 order modifying the case schedule, fact discovery is scheduled to be complete by August 5, 2020, expert discovery is scheduled to be complete by December 23, 2020, and dispositive motions are due by January 20, 2021. As of March 31, 2020 and December 31, 2019, we accrued \$13 million of estimated losses for this action, which represents our best estimate of the lower bound of the costs to resolve this case. The ultimate amount of loss may be materially higher.

Derivative Actions

On July 16, 2013, a derivative complaint was filed in the Superior Court of Arizona, Maricopa County, formerly titled *Bargar, et al. v. Ahearn, et al.*, and now titled *Kaufold v. Ahearn, et. al.*, Case No. CV2013-009938, by a putative stockholder against certain current and former directors and officers of the Company ("Kaufold"). The complaint generally alleges that the defendants caused or allowed false and misleading statements to be made

concerning the Company's financial performance and prospects. The action includes claims for, among other things, breach of fiduciary duties, insider trading, unjust enrichment, and waste of corporate assets. By court order on October 3, 2013, the Superior Court of Arizona, Maricopa County granted the parties' stipulation to defer defendants' response to the complaint pending resolution of the Class Action or expiration of a stay issued in certain consolidated derivative actions in the Arizona District Court. On November 5, 2013, the matter was placed on the court's inactive calendar. The parties have jointly sought and obtained multiple requests to continue the stay in this action. Most recently, on March 5, 2020, the court entered an order continuing the stay until July 31, 2020. On December 5, 2019, the court granted a motion by one of two named plaintiffs to voluntarily dismiss that plaintiff's claims; one named plaintiff remains in the case.

The Company believes that the plaintiff in the Kaufold derivative action lacks standing to pursue litigation on behalf of First Solar. The Kaufold derivative action is still in the initial stages and there has been no discovery. Accordingly, 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 potential loss, if any.

Other Matters and Claims

We are party to other legal matters and claims in the normal course of our operations. While we believe the ultimate outcome of such other 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.

11. Revenue from Contracts with Customers

The following table represents a disaggregation of revenue from contracts with customers for the three months ended March 31, 2020 and 2019 along with the reportable segment for each category (in thousands):

Category	Segment	Three Months Ended March 31,	
		2020	2019
Solar modules	Modules	\$ 393,681	\$ 198,815
Solar power systems	Systems	90,076	157,294
EPC services	Systems	919	137,594
O&M services	Systems	29,475	27,700
Energy generation	Systems	17,973	10,575
Net sales		<u>\$ 532,124</u>	<u>\$ 531,978</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.

For certain sales of solar power systems and/or EPC services, we recognize revenue over time using cost based input methods, in which significant judgment is required to evaluate assumptions including the amount of net contract revenues and the total estimated costs to determine our progress toward contract completion. If the estimated total costs on any contract are greater than the net contract revenues, we recognize the entire estimated loss in the period the loss becomes known. The cumulative effect of revisions to estimates related to net contract revenues or costs to complete contracts are recorded in the period in which the revisions to estimates are identified and the amounts can be reasonably estimated.

Changes in estimates for sales of systems and EPC services occur for a variety of reasons, including but not limited to (i) construction plan accelerations or delays, (ii) module cost forecast changes, (iii) cost related change orders, or (iv) changes in other information used to estimate costs. Changes in estimates may have a material effect on our condensed consolidated statements of operations.

The following table outlines the impact on revenue of net changes in estimated transaction prices and input costs for systems related sales contracts (both increases and decreases) for the three months ended March 31, 2020 and 2019 as well as the number of projects that comprise such changes. For purposes of the table, we only include projects with changes in estimates that have a net impact on revenue of at least \$1.0 million during the periods presented. Also included in the table is the net change in estimate as a percentage of the aggregate revenue for such projects.

	Three Months Ended March 31,	
	2020	2019
Number of projects	2	8
(Decrease) increase in revenue from net changes in transaction prices (in thousands)	\$ (762)	\$ 6,114
Increase (decrease) in revenue from net changes in input cost estimates (in thousands)	1,885	(15,950)
Net increase (decrease) in revenue from net changes in estimates (in thousands)	<u>\$ 1,123</u>	<u>\$ (9,836)</u>
Net change in estimate as a percentage of aggregate revenue	0.3 %	(0.5)%

The following table reflects the changes in our contract assets, which we classify as “Accounts receivable, unbilled” or “Retainage,” and our contract liabilities, which we classify as “Deferred revenue,” for the three months ended March 31, 2020 (in thousands):

	March 31, 2020	December 31, 2019	Three Month Change	
Accounts receivable, unbilled (1)	\$ 109,054	\$ 162,057		
Retainage	25,577	21,416		
Allowance for credit losses	(1,223)	—		
Accounts receivable, unbilled and retainage, net	<u>\$ 133,408</u>	<u>\$ 183,473</u>	\$ (50,065)	(27)%
Deferred revenue (2)	<u>\$ 206,503</u>	<u>\$ 394,655</u>	\$ (188,152)	(48)%

(1) Includes \$12.3 million of long-term accounts receivable, unbilled classified as “Other assets” on our condensed consolidated balance sheet as of March 31, 2020.

(2) Includes \$69.5 million and \$71.4 million of long-term deferred revenue classified as “Other liabilities” on our condensed consolidated balance sheets as of March 31, 2020 and December 31, 2019, respectively.

During the three months ended March 31, 2020, our contract assets decreased by \$50.1 million primarily due to billings associated with ongoing construction activities at the Sun Streams and Sunshine Valley projects, partially offset by certain unbilled receivables from ongoing construction activities at the GA Solar 4 project. During the three months ended March 31, 2020, our contract liabilities decreased by \$188.2 million primarily due to the recognition of revenue for sales of solar modules for which payment was received in 2019 prior to the step down in the U.S. investment tax credit, partially offset by advance payments received for sales of solar modules in the current period. During the three months ended March 31, 2020 and 2019, we recognized revenue of \$268.2 million and \$46.7 million, respectively, that was included in the corresponding contract liability balance at the beginning of the periods.

The following table represents our remaining performance obligations as of March 31, 2020 for sales of solar power systems, including uncompleted sold projects and projects under contracts subject to conditions precedent. Such table excludes remaining performance obligations for sales arrangements that had not fully satisfied the criteria to be considered a contract with a customer pursuant to the requirements of ASC 606. We expect to recognize \$45.2 million of revenue for such contracts through the substantial completion dates of the projects.

Project/Location	Project Size in MW _{AC}	Revenue Category	Customer	Expected Year Revenue Recognition Will Be Completed	Percentage of Revenue Recognized
GA Solar 4, Georgia	200	Solar power systems	Origis Energy USA	2020	89%
Sun Streams, Arizona	150	Solar power systems	(1)	2020	96%
Sunshine Valley, Nevada	100	Solar power systems	(1)	2020	97%
Seabrook, South Carolina	72	Solar power systems	Dominion Energy	2020	97%
Total	522				

(1) EDP Renewables and ConnectGen

As of March 31, 2020, we had entered into contracts with customers for the future sale of 11.1 GW_{DC} of solar modules for an aggregate transaction price of \$3.7 billion. We expect to recognize such amounts as revenue through 2023 as we transfer control of the modules to the customers. While our contracts with customers typically represent firm purchase commitments, these contracts may be subject to amendments made by us or requested by our customers. 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. As of March 31, 2020, we had entered into O&M contracts covering approximately 12 GW_{DC} of utility-scale PV solar power systems. We expect to recognize \$0.4 billion of revenue during the noncancelable term of these O&M contracts over a weighted-average period of 9.3 years.

12. 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, 2020 and 2019 (in thousands):

	Three Months Ended March 31,	
	2020	2019
Cost of sales	\$ 1,212	\$ 1,840
Selling, general and administrative	4,709	2,338
Research and development	1,283	841
Total share-based compensation expense	\$ 7,204	\$ 5,019

Share-based compensation expense capitalized in inventory, project assets, and PV solar power systems was \$1.3 million and \$1.2 million as of March 31, 2020 and December 31, 2019, respectively. As of March 31, 2020, we had \$48.8 million of unrecognized share-based compensation expense related to unvested restricted and performance stock units, which we expect to recognize over a weighted-average period of approximately 1.8 years.

In February 2017, the compensation committee of our board of directors approved a long-term incentive program for key executive officers and associates. The program is intended to incentivize retention of our key executive talent, provide a smooth transition from our former key senior talent equity performance program, and align the interests of executive management and stockholders. Specifically, the program consists of (i) performance stock units to be earned over an approximately three-year performance period, which ended in December 2019, and (ii) stub-year grants of separate performance stock units to be earned over an approximately two-year performance period, which ended in December 2018. In February 2019, the compensation committee of our board of directors certified the

achievement of the maximum vesting conditions applicable for the stub-year grants. Accordingly, each participant received one share of common stock for each vested performance unit, net of any tax withholdings. In February 2020, the compensation committee of our board of directors certified the achievement of the threshold vesting conditions applicable to the remaining 2017 grants of performance stock units. Accordingly, each participant received one share of common stock for each vested performance unit, net of any tax withholdings.

In April 2018, in continuation of our long-term incentive program for key executive officers and associates, the compensation committee of our board of directors approved additional grants of performance stock units to be earned over an approximately three-year performance period ending in December 2020. Vesting of the 2018 grants of performance stock units is contingent upon the relative attainment of target gross margin, operating expense, and contracted revenue metrics.

In July 2019, the compensation committee of our board of directors approved additional grants of performance stock units for key executive officers. Such grants are expected to be earned over a multi-year performance period ending in December 2021. Vesting of the 2019 grants of performance stock units is contingent upon the relative attainment of target cost per watt, module wattage, gross profit, and operating income metrics.

In March 2020, the compensation committee of our board of directors approved additional grants of performance stock units for key executive officers. Such grants are expected to be earned over a multi-year performance period ending in December 2022. Vesting of the 2020 grants of performance stock units is contingent upon the relative attainment of contracted revenue, module wattage, and return on capital metrics.

Vesting of performance stock 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 stock 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.

13. Income Taxes

On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security (CARES) Act (the “CARES Act”) was signed into law. The CARES Act includes a number of federal corporate tax relief provisions that are intended to support the ongoing liquidity of U.S. corporations. Among other provisions, the CARES Act allows net operating losses incurred in 2018, 2019, and 2020 to be carried back to each of the five preceding taxable years. Because changes in tax law are accounted for in the period of enactment, the retroactive effects of such changes are accounted for as a discrete item in our tax provision.

Our effective tax rate was (5,657)% and 2% for the three months ended March 31, 2020 and 2019, respectively. The decrease in our effective tax rate was primarily driven by a discrete tax benefit associated with the net operating loss carryback provisions of the CARES Act described above and the relative size of our pretax income in the current period. 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 the effect of tax law changes associated with the CARES Act.

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.

In the normal course of business, we establish valuation allowances for our deferred tax assets when the realization of the assets is not more likely than not. We intend to maintain such valuation allowances on our deferred tax assets until there is sufficient evidence to support the reversal of all or some portion of the allowances. Given our anticipated future earnings in a foreign jurisdiction, it is reasonably possible that, within the next 12 months,

sufficient positive evidence may become available to allow us to reverse the valuation allowance in such jurisdiction. However, the exact timing and amount of such reversal is subject to change depending on our future earnings in the jurisdiction and other factors.

We account for uncertain tax positions pursuant to the recognition and measurement criteria under ASC 740. It is reasonably possible that \$58.6 million of uncertain tax positions will be recognized within the next 12 months due to the expiration of the statute of limitations associated with such positions.

We are subject to audit by federal, state, local, and foreign tax authorities. We are currently under examination in Chile, India, Malaysia, 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.

14. Net Income (Loss) per Share

The calculation of basic and diluted net income (loss) per share for the three months ended March 31, 2020 and 2019 was as follows (in thousands, except per share amounts):

	Three Months Ended March 31,	
	2020	2019
Basic net income (loss) per share		
Numerator:		
Net income (loss)	\$ 90,704	\$ (67,599)
Denominator:		
Weighted-average common shares outstanding	105,595	105,046
Diluted net income (loss) per share		
Denominator:		
Weighted-average common shares outstanding	105,595	105,046
Effect of restricted and performance stock units and stock purchase plan shares	791	—
Weighted-average shares used in computing diluted net income (loss) per share	106,386	105,046
Net income (loss) per share:		
Basic	\$ 0.86	\$ (0.64)
Diluted	\$ 0.85	\$ (0.64)

The following table summarizes the shares of common stock that were excluded from the computation of diluted net income (loss) per share for the three months ended March 31, 2020 and 2019 as such shares would have had an anti-dilutive effect (in thousands):

	Three Months Ended March 31,	
	2020	2019
Anti-dilutive shares	—	864

15. 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, 2020 (in thousands):

	Foreign Currency Translation Adjustment	Unrealized Gain (Loss) on Marketable Securities and Restricted Marketable Securities	Unrealized Gain (Loss) on Derivative Instruments	Total
Balance as of December 31, 2019	\$ (73,429)	\$ (5,029)	\$ (876)	\$ (79,334)
Other comprehensive (loss) income before reclassifications	(8,064)	17,551	768	10,255
Amounts reclassified from accumulated other comprehensive loss	—	(15,088)	207	(14,881)
Net tax effect	—	389	(79)	310
Net other comprehensive (loss) income	(8,064)	2,852	896	(4,316)
Balance as of March 31, 2020	\$ (81,493)	\$ (2,177)	\$ 20	\$ (83,650)

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, 2020 and 2019 (in thousands):

Comprehensive Income Components	Income Statement Line Item	Three Months Ended March 31,	
		2020	2019
Unrealized gain on marketable securities and restricted marketable securities	Other (expense) income, net	15,088	15,016
Unrealized loss on derivative contracts:			
Foreign exchange forward contracts	Cost of sales	(207)	—
		(207)	—
Total amount reclassified		\$ 14,881	\$ 15,016

16. Segment Reporting

We operate our business in two segments. Our modules segment 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 integrators and operators of PV solar power systems. Our second segment is our systems segment, through which we provide power plant solutions, which include (i) project development, (ii) EPC services, and (iii) O&M services. We may provide any combination of individual products and services within such capabilities (including, with respect to EPC services, by contracting with third parties) depending upon the customer and market opportunity. Our systems segment customers include utilities, independent power producers, commercial and industrial companies, and other system owners. As part of our systems segment, we may also temporarily own and operate certain of our systems for a period of time based on strategic opportunities or market factors. See Note 21. “Segment and Geographical Information” in our Annual Report on Form 10-K for the year ended December 31, 2019 for additional discussion of our segment reporting.

The following tables present certain financial information for our reportable segments for the three months ended March 31, 2020 and 2019 and as of March 31, 2020 and December 31, 2019 (in thousands):

	Three Months Ended March 31, 2020			Three Months Ended March 31, 2019		
	Modules	Systems	Total	Modules	Systems	Total
Net sales	\$ 393,681	\$ 138,443	\$ 532,124	\$ 198,815	\$ 333,163	\$ 531,978
Gross profit (loss)	75,352	14,986	90,338	(24,996)	25,108	112
Depreciation and amortization expense	44,673	6,258	50,931	39,535	4,259	43,794

	March 31, 2020			December 31, 2019		
	Modules	Systems	Total	Modules	Systems	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 concerning, among other things: the length and severity of the recent COVID-19 (novel coronavirus) outbreak, including its impacts across our businesses on demand, manufacturing, project development, construction, O&M, financing, and our global supply chains, actions that may be taken by governmental authorities to contain the COVID-19 outbreak or to treat its impacts, and the ability of our customers, suppliers, equipment vendors, and other counterparties to fulfill their contractual obligations to us; effects resulting from certain module manufacturing changes and associated restructuring activities; 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, 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, such as tariffs or other trade remedies imposed on solar cells and modules; effects resulting from pending litigation, including the opt-out action against us; our ability to expand manufacturing capacity worldwide; our ability to reduce the costs to develop and construct PV solar power systems; research and development ("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," 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, the severity and duration of the COVID-19 pandemic, including its potential impact on the Company's business, financial condition, and results of operations; 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; reduction, elimination, or expiration of government subsidies, policies, and support programs for solar energy projects; the impact of public policies, such as tariffs or other trade remedies imposed on solar cells and modules; our ability to execute on our long-term strategic plans; our ability to execute on our solar module technology and cost reduction roadmaps; our ability to improve the wattage of our solar modules; interest rate fluctuations and both our and our customers' ability to secure financing; the creditworthiness of our off-take counterparties and the ability of our off-take counterparties to fulfill their contractual obligations to us; the ability of our customers and counterparties to perform under their contracts with us; the satisfaction of conditions precedent in our project sales agreements; our ability to attract new customers and to develop and maintain existing customer and supplier relationships; our ability to successfully develop and complete our systems business projects; our ability to convert existing production facilities to support new product lines, such as Series 6 module manufacturing; 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 resulting from pending litigation, including the opt-out action against us; future collection and recycling costs for solar modules covered by our module collection and recycling program; 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 research and development; the supply and price of components and raw materials, including CdTe; our ability to attract and retain key executive officers and associates; and the matters discussed in Item 1A. “Risk Factors” of our Annual Report on Form 10-K for the year ended December 31, 2019, 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 these reports.

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. 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. When referring to our projects or systems, the unit of electricity in watts for MW and GW is alternating current (“AC” or “AC”) unless otherwise noted.

Executive Overview

We are a leading global provider of comprehensive PV solar energy solutions. We design, manufacture, and sell PV solar modules with an advanced thin film semiconductor technology and also develop and sell PV solar power systems that primarily use the modules we manufacture. Additionally, we provide O&M services to system owners. We have substantial, ongoing R&D efforts focused on various technology innovations. We are the world’s largest thin film PV solar module manufacturer and one of the world’s largest PV solar module manufacturers.

Certain of our financial results and other key operational developments for the three months ended March 31, 2020 include the following:

- Net sales for the three months ended March 31, 2020 were \$532.1 million, which was consistent with net sales for the same period in 2019. The increase in net sales from the volume of modules sold to third parties and ongoing construction activities at the GA Solar 4 project was offset by the decrease in net sales due to the completion of substantially all construction activities at the Rosamond, Phoebe, and Lake Hancock projects in 2019.
- Gross profit for the three months ended March 31, 2020 increased to 17.0% from 0.0% for the same period in 2019. The increase in gross profit was primarily due to higher gross profit on third-party module sales and improved utilization of our manufacturing facilities from the successful ramp of various Series 6 manufacturing lines, partially offset by the mix of lower gross profit projects under construction during the period.
- As of March 31, 2020, we had 5.5 GW_{DC} of total installed Series 6 nameplate production capacity across all our facilities. We produced 1.5 GW_{DC} of solar modules during the three months ended March 31, 2020, which represented a 34% increase from the same period in 2019. The increase in production was primarily driven by the Series 6 production capacity added in 2019 at our second facility in Ho Chi Minh City, Vietnam and our facility in Lake Township, Ohio as well as improved utilization at various facilities, partially offset by the ramp down of our Series 4 manufacturing lines. We expect to produce 5.9 GW_{DC} of solar modules during 2020, substantially all of which will be Series 6 modules.
- In response to the COVID-19 pandemic, governmental authorities have recommended or ordered the limitation or cessation of certain business or commercial activities in jurisdictions in which we operate, including the United States, Malaysia, and Vietnam. At this time, such limitations have had a limited effect on our manufacturing facilities. However, these orders are subject to continuous revision, and our

understanding of the applicability of these orders and any potential exemptions may change at any time. To enable the continuity of our operations, we have implemented a wide range of safety measures intended to inhibit the spread of COVID-19 at our manufacturing, administrative, and other sites and facilities.

- In January 2020, we entered into an MOU to settle a class action lawsuit filed in 2012 in the Arizona District Court against the Company and certain of our current and former officers and directors. Pursuant to the MOU, we paid a total of \$350 million to settle the claims brought on behalf of all persons who purchased or otherwise acquired the Company's shares during a specified period, in exchange for mutual releases and a dismissal with prejudice of the complaint upon court approval of the settlement. The settlement contained no admission of liability, wrongdoing, or responsibility by any of the parties.

Market Overview

The solar industry continues to be characterized by intense pricing competition, both at the module and system levels. In particular, module average selling prices in many global markets have declined in recent years and are expected to continue to decline in the future. Furthermore, the COVID-19 pandemic has adversely affected certain purchasers of modules and systems, which may result in additional pressure on demand and average selling prices. In the aggregate, we believe manufacturers of solar cells and modules have significant installed production capacity, relative to global demand, and the ability for additional capacity expansion. Accordingly, we believe the solar industry may from time to time experience periods of structural imbalance between supply and demand (i.e., where production capacity exceeds global demand), and that such periods will also put pressure on pricing, which may be exacerbated by the current COVID-19 disruption in the global economy. Additionally, intense competition at the system level 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 diversified module manufacturers to sustain meaningful and consistent profitability. 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 financial viability, and the sustainability advantage of our modules and systems.

Global solar markets continue to expand and develop, in part aided by demand elasticity resulting from declining average selling prices, both at the module and system levels, which have promoted the widespread adoption of solar energy. As a result of such market opportunities, we are expanding our manufacturing capacity while also developing and operating multiple solar projects around the world as we execute on our utility-scale project pipeline. See the tables under "Management's Discussion and Analysis of Financial Condition and Results of Operations – Systems Project Pipeline" for additional information about projects within our advanced-stage pipeline. Although we expect a meaningful portion of our future consolidated net sales, operating income, and cash flows to be derived from such projects, we expect third-party module sales to continue to have a more significant impact on our operating results as we expand capacity and leverage the benefits of our Series 6 module technology.

Lower industry module and system pricing is expected to contribute to diversification in global electricity generation and further demand for solar energy. Over time, however, declining average selling prices may adversely affect our results of operations to the extent we have not already entered into contracts for future module or system sales. If competitors reduce pricing to levels below their costs; bid aggressively low prices for module sale agreements or PPAs; or are able to operate at minimal or negative operating margins for sustained periods of time, our results of operations could be further adversely affected. In certain markets in California and elsewhere, an oversupply imbalance at the grid level may reduce short-to-medium term demand for new solar installations relative to prior years, lower PPA pricing, and lower margins on module and system sales to such markets. However, we believe the effects of such imbalance can be mitigated by modern solar power plants that offer a flexible operating profile, thereby promoting greater grid stability and enabling a higher penetration of solar energy. We continue to address these uncertainties, in part, by executing on our module technology improvements, partnering with grid operators and utility companies, and implementing certain other cost reduction initiatives.

We face intense competition from manufacturers of crystalline silicon solar modules and developers of solar power projects. Solar module manufacturers compete with one another on price and on several module value attributes, including wattage (or conversion efficiency), energy yield, and reliability, and developers of systems compete on various factors such as net present value, return on equity, and levelized cost of electricity (“LCOE”), meaning the net present value of a system’s total life cycle costs divided by the quantity of energy that is expected to be produced over the system’s life. Many crystalline silicon cell and wafer manufacturers continue to transition from lower efficiency Back Surface Field multi-crystalline cells (the legacy technology against which we have generally competed) to higher efficiency Passivated Emitter Rear Contact (“PERC”) mono-crystalline cells at competitive cost structures. Additionally, while conventional solar modules, including the solar modules we produce, are monofacial, meaning their ability to produce energy is a function of direct and diffuse irradiance on their front side, certain manufacturers of mono-crystalline PERC modules are promoting bifacial modules that also capture diffuse irradiance on the back side of a module. The cost effective manufacture of bifacial PERC modules has been enabled, in part, by the expansion of inexpensive crystal growth and diamond wire saw capacity in China. 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 when applied in certain applications, which, after considering the incremental BoS and other costs, could potentially lower the overall LCOE of a system when compared to systems using conventional solar modules, including the modules we produce.

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 1-2% 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, such as the adoption of diamond wire saw technology, which have contributed to declines in our relative manufacturing cost competitiveness over conventional crystalline silicon module manufacturers.

In terms of energy yield, in many climates our CdTe solar modules provide an energy production advantage over most monofacial crystalline silicon solar modules of equivalent efficiency rating. For example, our CdTe solar modules provide 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). In addition, our CdTe solar modules provide a superior spectral response in humid environments where atmospheric moisture alters the solar spectrum relative to laboratory standards. Our CdTe solar modules also provide a better shading response than conventional crystalline silicon solar modules, which may experience significantly lower energy generation than CdTe solar modules when shading occurs. As a result of these and other factors, our PV solar modules typically produce more annual energy in real world field conditions than conventional modules with the same nameplate capacity. Furthermore, our thin-film CdTe semiconductor technology is immune to cell cracking and its resulting power output loss, a common failure often observed in crystalline silicon modules caused by adverse manufacturing, handling, weather, or other conditions.

While our modules and systems 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 systems and additional margin compression. We continue to focus on enhancing the competitiveness of our solar modules and systems by accelerating progress along 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, 2019 and Item 1A. of this Quarterly Report on Form 10-Q for discussions of other risks (the “Risk Factors”) that may affect us.

Our long-term strategic plans are focused on our goal to create long-term shareholder value through a balance of growth, profitability, and liquidity. In executing such plans, we are focusing on providing utility-scale PV solar energy solutions in key geographic markets that we believe have a compelling need for mass-scale PV solar electricity, including markets throughout the Americas, the Asia-Pacific region, Europe, and certain other strategic markets. While these markets are expected to exhibit strong long-term demand for solar energy, the economic disruption caused by the COVID-19 pandemic has adversely affected near-term demand for electricity at the grid level. As a result, such temporary decline in load may adversely affect demand for specific forms of generation, such as our PV solar energy solutions, depending on the severity and duration of the economic disruption. Given these market dynamics, we are focusing on opportunities in which our PV solar energy solutions can compete directly with traditional forms of energy generation on an LCOE or similar basis, or complement such generation offerings. These opportunities include the retirement and replacement of aging fossil fuel-based generation resources with utility-scale PV solar energy solutions. For example, cumulative global retirements of coal generation plants are expected to approximate 900 GW_{DC} by 2040, representing a significant increase in the potential market for solar energy.

This focus on our core module and utility-scale offerings exists within a current market environment that includes rooftop and distributed generation solar, particularly in the United States. While it is unclear how rooftop and distributed generation solar might impact our core utility-scale based offerings over the next several years, 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, our module offerings in certain international markets may be driven, in part, by future demand for rooftop and distributed generation solar solutions.

Our ability to provide utility-scale offerings on economically attractive terms depends, in part, on market factors outside our control, such as the availability of debt and/or equity financing (including, in the United States, tax equity financing), interest rate fluctuations, domestic or international trade policies, and government support programs. Adverse changes in these factors could increase the cost of utility-scale systems, which could reduce demand for such systems and limit the number of potential buyers. For example, we generally sell projects we have developed within our systems business, including projects in the United States, Japan, and elsewhere, to purchasers that depend on financing to fund the initial capital expenditures required to develop, build, and/or purchase a system. Although governments and central banks around the world have implemented significant measures to support capital markets, the economic disruption caused by the COVID-19 pandemic may result in a long-term tightening of the supply of capital in global financial markets (including, in the United States, a reduction in total tax equity availability). A reduction in the supply of project debt or equity financing (including, in the United States, tax equity financing) caused by the COVID-19 pandemic could make it difficult for our customers to secure the financing necessary to develop, build, purchase, or install systems. Similarly, purchasers of modules may cease or significantly reduce business operations, cease or delay module procurement, encounter an inability to obtain financing, including due to a reduction in the supply of project debt financing or equity investments (including, in the United States, tax equity financing), conserve capital resources, or take other actions in response to the COVID-19 pandemic, which may reduce demand and average selling prices for our modules.

We are focusing our resources in those markets and energy applications in which solar power can be a least-cost, best-fit energy solution, particularly in regions with significant current or projected electricity demand, relatively high existing electricity prices, strong demand for renewable energy generation, and high solar resources. As a result, we closely evaluate and monitor the appropriate level of resources required to support such markets and their

associated sales opportunities. We have dedicated, and intend to continue to dedicate, significant capital and human resources to reduce the total installed cost of PV solar energy and to ensure that our solutions integrate well into the overall electricity ecosystem of each specific market.

Creating or maintaining a market position in certain strategically targeted markets and energy applications also requires us to adapt to new and changing market conditions. For example, we continue to monitor and adapt to the dynamics of emerging technologies, such as commercially viable energy storage solutions, which are expected to further enable PV solar power systems to compete with traditional forms of energy generation by shifting the delivery of energy generated by such systems to periods of greater demand. Storage solutions continue to evolve in terms of technology and cost, and cumulative global deployments of storage capacity are expected to exceed 900 GW_{DC} by 2040, representing a significant increase in the potential market for renewable energy. We also continue to monitor and adapt to changing dynamics in the market set of potential buyers of solar projects. Market environments with few potential project buyers and a higher cost of capital would generally exert downward pressure on the potential revenue from the solar projects we are developing, whereas, conversely, market environments with many potential project buyers and a lower cost of capital would likely have a favorable impact on the potential revenue from such solar projects. For example, the emergence of utility-owned generation has increased the number of potential project buyers as such utility customers benefit from a potentially low cost of capital available through rate-based utility investments. Given their long-term ownership profile, utility-owned generation customers typically seek to partner with diversified and stable companies that can provide a broad spectrum of utility-scale generation solutions, including reliable PV solar technology, thereby mitigating their long-term ownership risks.

On occasion, we may also elect to develop partially contracted or uncontracted systems for which there is a partial or no PPA with an off-taker, such as a utility, but rather an intent to sell some portion of the electricity produced by the system on an open contract basis until the system is sold. Expected revenue from projects without a PPA for the full off-take of the system is subject to greater variability and uncertainty based on market factors and is typically lower than projects with a PPA for the full off-take of the system. Furthermore, all system pricing is affected by the pricing of energy to be sold on an open contract basis following the termination of the PPA (i.e., merchant pricing curves), and changes in market assumptions regarding future open contract sales, including potential changes in energy demand caused by the COVID-19 pandemic, may also result in significant variability and uncertainty in the value of our systems projects.

As previously disclosed, following an evaluation of the long-term sustainable cost structure, competitiveness, and risk-adjusted returns of our U.S. project development business, we have determined it is in the best interest of our stockholders to explore options for this business line. This exploration may result in, among other possibilities, a partnership with a third-party who possesses complimentary competencies or a sale of all or a portion of our U.S. project development business. These potential third-party partners or purchasers of interests in our U.S. project development business may now, or in the future, be impacted by the global business disruption caused by the COVID-19 pandemic, and may consequently focus on their own operations and/or delay considering potential partnerships or other arrangements with respect to our U.S. project development business. While we have previously disclosed that the exploration of options for our U.S. project development business is not subject to any definitive timetable and there can be no assurances that this process will result in any transaction, the COVID-19 pandemic may have the effect of delaying or preventing the consummation of any such transaction.

We continually evaluate forecasted global demand, competition, and our addressable market and seek to effectively balance manufacturing capacity with market demand and the nature and extent of our competition. During 2019, we commenced commercial production of Series 6 modules at our second manufacturing facility in Ho Chi Minh City, Vietnam and our manufacturing facility in Lake Township, Ohio. In 2020, we expect to transition certain legacy Series 4 manufacturing facilities in Kulim, Malaysia to our Series 6 module technology and continue to expand capacity and throughput at our other existing manufacturing facilities. Such additional capacity, and any other potential investments to add 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 the Risk Factors.

In response to the COVID-19 pandemic, governmental authorities have recommended or ordered the limitation or cessation of certain business or commercial activities in jurisdictions in which we do business or have operations. While some of these orders permit the continuation of essential business operations, or permit the performance of minimum business activities, these orders are subject to continuous revision or may be revoked or superseded, or our understanding of the applicability of these orders and exemptions, may change at any time. In addition, due to contraction of the virus, or concerns about becoming ill from the virus, we may experience reductions in the availability of our operational workforce, such as our manufacturing personnel. As a result, we may at any time be ordered by governmental authorities, or we may determine, based on our understanding of the recommendations or orders of governmental authorities or the availability of our personnel, that we have to curtail or cease business operations or activities altogether, including manufacturing, fulfillment, project development, construction, operating or maintenance operations, or research and development activities. At this time, such limitations have had a limited effect on our manufacturing facilities, and we have implemented a wide range of safety measures intended to enable the continuity of our operations and inhibit the spread of COVID-19 at our manufacturing, administrative, and other sites and facilities, including those in the United States, Malaysia, and Vietnam.

Systems Project Pipeline

The following tables summarize, as of May 7, 2020, our approximately 1.7 GW_{AC} advanced-stage project pipeline. The actual volume of modules installed in our projects will be greater than the project size in MW_{AC} as module volumes required for a project are based upon MW_{DC}, which will be greater than the MW_{AC} size pursuant to a DC-AC ratio typically ranging from 1.1 to 1.4. Such ratio varies across different projects due to many factors, including PPA pricing and the location, design, and costs of the system. Projects are typically removed from our advanced-stage project pipeline tables below once we substantially complete construction of the project and after substantially all of the associated project revenue is recognized. A project, or a portion of a project, may also be removed from the tables below in the event a project is not able to be sold due to the changing economics of the project or other factors or we decide to temporarily own and operate a project based on strategic opportunities or market factors.

Projects under Sales Agreements

The following table includes uncompleted sold projects and projects under contracts subject to conditions precedent:

Project/Location	Project Size in MW_{AC}	PPA Contracted Partner	Customer	Expected Year Revenue Recognition Will Be Completed	% of Revenue Recognized as of March 31, 2020
GA Solar 4, Georgia	200	Georgia Power Company	Origis Energy USA	2020	89%
Sun Streams, Arizona	150	SCE	(1)	2020	96%
Sunshine Valley, Nevada	100	SCE	(1)	2020	97%
Seabrook, South Carolina	72	South Carolina Electric and Gas Company	Dominion Energy	2020	97%
Total	522				

Projects with Executed PPAs Not under Sales Agreements

Project/Location	Project Size in MW_{AC}	PPA Contracted Partner	Fully Permitted	Expected or Actual Substantial Completion Year	% Complete as of March 31, 2020
Horizon, Texas	200	(2)	No	2022	—%
Ridgely, Tennessee	177	Tennessee Valley Authority	No	2023	—%
Sun Streams 2, Arizona	150	Microsoft Corporation	Yes	2020/2021	10%
Luz del Norte, Chile	141	(3)	Yes	2016	100%
American Kings Solar, California	123	SCE	Yes	2020	42%
Rabbitbrush, California	100	(4)	No	2022	5%
Sun Streams PVS, Arizona	65	APS	No	2022	6%
Ishikawa, Japan	59	Hokuriku Electric Power Company	Yes	2018	100%
Japan (multiple locations)	55	(5)	Yes	2021/2022	21%
Miyagi, Japan	40	Tohoku Electric Power Company	Yes	2021	42%
India (multiple locations)	40	(6)	Yes	2017	100%
Total	<u>1,150</u>				

(1) EDP Renewables and ConnectGen

(2) 150 MW_{AC} of the plant's capacity is contracted with an unspecified counterparty; remaining capacity to be sold on an open contract basis

(3) Approximately 70 MW_{AC} of the plant's capacity is contracted under various PPAs; remaining capacity to be sold on an open contract basis

(4) Monterey Bay Community Power – 60 MW_{AC} and Silicon Valley Clean Energy – 40 MW_{AC}

(5) Chubu Electric Power Company – 38 MW_{AC} and Hokuriku Electric Power Company – 17 MW_{AC}

(6) Gulbarga Electricity Supply Co. – 20 MW_{AC} and Chamundeshwari Electricity Supply Co. – 20 MW_{AC}

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, 2020 and 2019:

	Three Months Ended March 31,	
	2020	2019
Net sales	100.0 %	100.0 %
Cost of sales	83.0 %	100.0 %
Gross profit	17.0 %	— %
Selling, general and administrative	11.0 %	8.5 %
Research and development	4.8 %	4.1 %
Production start-up	0.8 %	1.8 %
Operating income (loss)	0.3 %	(14.4)%
Foreign currency (loss) income, net	(0.1)%	— %
Interest income	1.8 %	2.7 %
Interest expense, net	(1.3)%	(1.9)%
Other (expense) income, net	(0.4)%	0.7 %
Income tax benefit	16.8 %	0.3 %
Equity in earnings, net of tax	— %	— %
Net income (loss)	17.0 %	(12.7)%

Segment Overview

We operate our business in two segments. Our modules segment involves the design, manufacture, and sale of CdTe solar modules to third parties, and our systems segment includes the development, construction, operation, maintenance, and sale of PV solar power systems, including any modules installed in such systems and any revenue from energy generated by such systems.

Net sales*Modules Business*

We generally price and sell our solar modules on a per watt basis. During the three months ended March 31, 2020, we sold the majority of our solar modules to integrators 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.

Systems Business

During the three months ended March 31, 2020, the majority of our systems business net sales were in the United States and were denominated in U.S. dollars. We recognize revenue for the sale of a development project, which excludes EPC services, or for the sale of a completed system when we enter into the associated sales contract with the customer. For other sales of solar power systems and/or EPC services, we generally recognize revenue over time as our performance creates or enhances an energy generation asset controlled by the customer. Furthermore, the sale of a solar power system combined with EPC services represents a single performance obligation for the development and construction of a single generation asset. For such arrangements, we recognize revenue as work is performed using cost based input methods, which result in revenue being recognized as work is performed based on the relationship between actual costs incurred compared to the total estimated costs for a given contract.

The following table shows net sales by reportable segment for the three months ended March 31, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2020	2019		
Modules	\$ 393,681	\$ 198,815	\$ 194,866	98 %
Systems	138,443	333,163	(194,720)	(58) %
Net sales	\$ 532,124	\$ 531,978	\$ 146	— %

Net sales from our modules segment increased \$194.9 million for the three months ended March 31, 2020 compared to the three months ended March 31, 2019 primarily due to a 96% increase in the volume of watts sold. Net sales from our systems segment decreased \$194.7 million for the three months ended March 31, 2020 compared to the three months ended March 31, 2019 primarily due to the completion of substantially all construction activities at the Rosamond, Phoebe, and Lake Hancock projects in 2019, partially offset by ongoing construction activities at the GA Solar 4 project.

Cost of sales

Modules Business

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).

Systems Business

For our systems business, project-related costs include 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, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2020	2019		
Modules	\$ 318,329	\$ 223,811	\$ 94,518	42 %
Systems	123,457	308,055	(184,598)	(60) %
Total cost of sales	\$ 441,786	\$ 531,866	\$ (90,080)	(17) %
% of net sales	83.0 %	100.0 %		

Our cost of sales decreased \$90.1 million, or 17%, and decreased 17.0 percentage points as a percent of net sales for the three months ended March 31, 2020 compared to the three months ended March 31, 2019. The decrease in cost of sales was driven by a \$184.6 million decrease in our systems segment cost of sales primarily due to the lower volume of projects under construction during the period. Such decrease was partially offset by a \$94.5 million increase in our modules segment cost of sales primarily due to higher costs of \$178.4 million from an increase in the volume of modules sold, partially offset by continued cost reductions in the cost per watt of our solar modules, which decreased cost of sales by \$64.6 million, and lower under-utilization and certain other charges associated with

the initial ramp of certain Series 6 manufacturing lines, which decreased cost of sales by \$28.1 million compared to 2019.

Gross profit

Gross profit may be affected by numerous factors, including the selling prices of our modules and systems, our manufacturing costs, project development costs, BoS 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 and systems businesses.

The following table shows gross profit for the three months ended March 31, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change
	2020	2019	
Gross profit	\$ 90,338	\$ 112	\$ 90,226 >100%
% of net sales	17.0 %	— %	

Gross profit for the three months ended March 31, 2020 increased to 17.0% from 0.0% during the three months ended March 31, 2019 primarily due to higher gross profit on third-party module sales and improved utilization of our manufacturing facilities from the successful ramp of various Series 6 manufacturing lines, partially offset by the mix of lower gross profit projects under construction during the period.

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, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change
	2020	2019	
Selling, general and administrative	\$ 58,587	\$ 45,352	\$ 13,235 29 %
% of net sales	11.0 %	8.5 %	

Selling, general and administrative expense for the three months ended March 31, 2020 increased compared to the three months ended March 31, 2019 primarily due to higher employee compensation expense, including higher severance and share-based compensation; an increase in professional fees; and higher expected credit losses for our accounts receivable due to the current economic conditions resulting from the COVID-19 pandemic. See Note 5. "Consolidated Balance Sheet Details" for further information about the allowance for credit losses associated with our accounts receivable.

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, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2020	2019		
Research and development	\$ 25,613	\$ 21,877	\$ 3,736	17 %
% of net sales	4.8 %	4.1 %		

Research and development expense for the three months ended March 31, 2020 increased compared to the three months ended March 31, 2019 primarily due to increased material and module testing costs and higher employee compensation expense.

Production start-up

Production start-up expense consists primarily of employee compensation and other costs associated with operating a production line before it is qualified for full production, including the cost of raw materials for solar modules run through the production line during the qualification phase and applicable facility related costs. Costs related to equipment upgrades and implementation of manufacturing process improvements are also included in production start-up expense as well as costs related to the selection of a new site, related legal and regulatory costs, and costs to maintain our plant replication program to the extent we cannot capitalize these expenditures. In general, we expect production start-up expense per production line to be higher when we build an entirely new manufacturing facility compared with the addition or replacement of production lines at an existing manufacturing facility, primarily due to the additional infrastructure investment required when building an entirely new facility.

The following table shows production start-up expense for the three months ended March 31, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2020	2019		
Production start-up	\$ 4,482	\$ 9,522	\$ (5,040)	(53) %
% of net sales	0.8 %	1.8 %		

During the three months ended March 31, 2020, we incurred production start-up expense for the transition to Series 6 module manufacturing at our second facility in Kulim, Malaysia and the capacity expansion of our manufacturing facility in Perrysburg, Ohio. During the three months ended March 31, 2019, we incurred production start-up expense at our facility in Lake Township, Ohio, and our second facility in Ho Chi Minh City, Vietnam, which commenced commercial production in early 2019.

Foreign currency (loss) income, net

Foreign currency (loss) income, 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) income, net for the three months ended March 31, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change
	2020	2019	
Foreign currency (loss) income, net	\$ (398)	\$ 172	\$ (570) >100%

Foreign currency loss for the three months ended March 31, 2020 was consistent with the three months ended March 31, 2019.

Interest income

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

The following table shows interest income for the three months ended March 31, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change
	2020	2019	
Interest income	\$ 9,330	\$ 14,259	\$ (4,929) (35)%

Interest income for the three months ended March 31, 2020 decreased compared to the three months ended March 31, 2019 primarily due to lower average balances of time deposits and lower interest rates on cash and cash equivalents.

Interest expense, net

Interest expense, net is primarily comprised of interest incurred on long-term debt, settlements of interest rate swap contracts, and changes in the fair value of interest rate swap contracts that do not qualify for hedge accounting in accordance with ASC 815. 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, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change
	2020	2019	
Interest expense, net	\$ (6,789)	\$ (10,121)	\$ 3,332 (33)%

Interest expense, net for the three months ended March 31, 2020 decreased compared to the three months ended March 31, 2019 primarily due to changes in the fair value of interest rate swap contracts, which do not qualify for hedge accounting, partially offset by higher interest expense associated with project debt.

Other (expense) income, net

Other (expense) income, 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 income, net for the three months ended March 31, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change
	2020	2019	
Other (expense) income, net	\$ (2,222)	\$ 3,509	\$ (5,731) >(100)%

Other (expense) income, net for the three months ended March 31, 2020 decreased compared to the three months ended March 31, 2019 primarily due to expected credit losses associated with certain notes receivable, partially offset by prior period charges associated with certain letter of credit arrangements and the impairment of a strategic investment. See Note 5. "Consolidated Balance Sheet Details" for further information about the allowance for credit losses for our notes receivable.

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 Australia, Japan, and Malaysia. 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 Australia, Japan, and Malaysia are 30%, 30.6%, and 24%, 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.

The following table shows income tax benefit for the three months ended March 31, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change
	2020	2019	
Income tax benefit	\$ 89,215	\$ 1,394	\$ 87,821 >100%
Effective tax rate	(5,657.3)%	2.0 %	

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 increased by \$87.8 million during the three months ended March 31, 2020 compared to the three months ended March 31, 2019 primarily due to an \$88.7 million discrete tax benefit from the effect of tax law changes associated with the CARES Act.

Equity in earnings, net of tax

Equity in earnings, net of tax represents our proportionate share of the earnings or losses from equity method investments as well as any gains or losses on the sale or disposal of such investments.

The following table shows equity in earnings, net of tax for the three months ended March 31, 2020 and 2019:

(Dollars in thousands)	Three Months Ended March 31,		Three Month Change	
	2020	2019		
Equity in earnings, net of tax	\$ (88)	\$ (173)	\$ 85	49 %

Equity in earnings, net of tax for the three months ended March 31, 2020 was consistent with the three months ended March 31, 2019.

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 over time revenue recognition, accrued solar module collection and recycling, product warranties, accounting for income taxes, and long-lived asset impairments 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, 2019. There have been no material changes to our accounting policies during the three months ended March 31, 2020 with the exception of certain changes to our allowance for credit losses accounting policies as part of the adoption of ASU 2016-13 as described in Note 2. "Recent Accounting Pronouncements" to our condensed consolidated financial statements.

Recent Accounting Pronouncements

See Note 2. "Recent Accounting Pronouncements" to our condensed consolidated financial statements for a summary of recent accounting pronouncements.

Liquidity and Capital Resources

As of March 31, 2020, we believe that our cash, cash equivalents, marketable securities, cash flows from operating activities, contracts with customers for the future sale of solar modules, and advanced-stage project pipeline will be sufficient to meet our working capital, systems project investment, and capital expenditure needs for at least the next 12 months. As needed, 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 our operations, such as systems project development activities in certain international regions. 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, such as a tightening of the supply of capital due to the COVID-19 pandemic and related

containment measures. 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, 2020, we had \$1.5 billion of cash, cash equivalents, and marketable securities compared to \$2.2 billion as of December 31, 2019. The decrease in cash, cash equivalents, and marketable securities was primarily driven by the \$350 million settlement payment associated with our prior class action lawsuit; the timing of cash receipts from certain third-party module sales, for which proceeds were received in late 2019 prior to the step down in the U.S. investment tax credit; purchases of property, plant and equipment; and other operating expenditures. As of March 31, 2020, \$0.9 billion of our cash, cash equivalents, and marketable securities was held by our foreign subsidiaries and was primarily based in U.S. dollar, Euro, and Japanese yen denominated holdings.

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 liquidity and capital resources.

Our systems business requires significant liquidity and is expected to continue to have significant liquidity requirements in the future. The net amount of our project assets and related portion of deferred revenue, which approximates our net capital investment in the development and construction of systems projects, was \$363.7 million as of March 31, 2020. Solar power project development cycles, which span the time between the identification of a site location and the commercial operation of a system, vary substantially and can take many years to mature. As a result of these long project cycles and strategic decisions to finance the development of certain projects using our working capital, we may need to make significant up-front investments of resources in advance of the receipt of any cash from the sale of such projects. Delays in construction or in completing the sale of our systems projects that we are self-financing may also impact our liquidity. In certain circumstances, we may need to finance construction costs exclusively using working capital, if project financing becomes unavailable due to regional, market-wide, or other concerns.

From time to time, we may develop projects in certain markets around the world where we may hold all or a significant portion of the equity in a project for several years. Given the duration of these investments and the currency risk relative to the U.S. dollar in some of these markets, we continue to explore local financing alternatives. Should these financing alternatives be unavailable or too cost prohibitive, we could be exposed to significant currency risk and our liquidity could be adversely impacted.

Additionally, we may elect to retain an ownership interest in certain systems projects after they become operational if we determine it would be of economic and strategic benefit to do so. If, for example, we cannot sell a system at economics that are attractive to us or potential customers are unwilling to assume the risks and rewards typical of system ownership, we may instead elect to temporarily own and operate such system until we can sell it on economically attractive terms. The decision to retain ownership of a system impacts our liquidity depending upon the size and cost of the project. As of March 31, 2020, we had \$470.7 million of net PV solar power systems that had been placed in service, primarily in international markets. We have elected, and may in the future elect, to enter into temporary or long-term project financing to reduce the impact on our liquidity and working capital with regards to such systems.

The following additional considerations have impacted or may impact our liquidity for 2020 and beyond:

- We expect to spend \$450 million to \$550 million for capital expenditures, including amounts related to the transition of our second manufacturing facility in Kulim, Malaysia from Series 4 to Series 6 module

technology and upgrades to other machinery and equipment, which we believe will further increase our module wattage and expand capacity and throughput at our other manufacturing facilities.

- In January 2020, we entered into an MOU to settle a class action lawsuit filed in the Arizona District Court. Pursuant to the MOU, among other things, we agreed to pay a total of \$350 million to settle the claims in the lawsuit in exchange for mutual releases and dismissal with prejudice of the complaint upon court approval of the settlement. In February 2020, we subsequently entered into a Stipulation and Agreement of Settlement (the “Settlement Agreement”) with certain named plaintiffs on terms and conditions that were consistent with the MOU. Pursuant to the Settlement Agreement, among other things, (i) we contributed \$350 million in cash to a settlement fund that will be used to pay all settlement fees and expenses, attorneys’ fees and expenses, and cash payments to members of the settlement class and (ii) the settlement class has agreed to release us, the other defendants named in the class action, and certain of their respective related parties from any and all claims concerning, based on, arising out of, or in connection with the class action. The Settlement Agreement contained no admission of liability, wrongdoing, or responsibility by any of the parties.

The settlement, including the payment and release described above, is subject to court approval. Following a February 27, 2020 hearing, the Arizona District Court entered an order on March 2, 2020 that granted preliminary approval of the settlement and permitted notice to the class. Under that order, among other matters, written objections from any objectors are due by June 9, 2020 and a final approval hearing is scheduled for June 30, 2020. If the court approves the settlement and enters such order and final judgement, and such judgement is no longer subject to further appeal or other review, the settlement fund will be disbursed in accordance with a plan of allocation approved by the court and the release will be effective to all members of the settlement class.

- 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 actual purchases under these supply agreements are expected to be approximately \$2.4 billion of substrate glass and \$500 million of cover glass. We have the right to terminate these agreements upon payment of specified termination penalties (which are up to \$430 million in the aggregate and decline over time during the respective supply periods).
- The balance of our solar module inventories and BoS parts was \$387.0 million as of March 31, 2020. As we continue to develop our advanced-stage project pipeline, we must produce solar modules in volumes sufficient to support our planned construction schedules. As part of this development and construction cycle, we typically produce these inventories in advance of receiving payment for such materials, which may temporarily reduce our liquidity. Once solar modules and BoS parts are installed in a project, they are classified as either project assets, PV solar power systems, or cost of sales depending on whether the project is subject to a definitive sales contract and whether other revenue recognition criteria have been met. We also produce significant volumes of modules for sale directly to third-parties, which requires us to carry inventories at levels sufficient to satisfy the demand of our customers and the needs of their projects, which may also temporarily reduce our liquidity.
- We may commit significant working capital over the next several years to advance the construction of various U.S. systems projects or procure the associated modules or BoS parts, by specified dates, for such projects to qualify for certain federal investment tax credits (“ITC”). Among other requirements, such credits require projects to have commenced construction in 2020, which may be achieved by certain qualifying procurement activities, to receive a 26% investment tax credit. The credit will step down to 22%

for projects that commence construction in 2021, and will further step down to 10% for projects that commence construction thereafter.

- We may also commit working capital to acquire solar power projects in various stages of development, including advanced-stage projects with PPAs, and to continue developing those projects, as necessary. Depending upon the size and stage of development, the costs to acquire such solar power projects could be significant. When evaluating project acquisition opportunities, we consider both the strategic and financial benefits of any such acquisitions.

Cash Flows

The following table summarizes key cash flow activity for the three months ended March 31, 2020 and 2019 (in thousands):

	Three Months Ended March 31,	
	2020	2019
Net cash used in operating activities	\$ (504,864)	\$ (303,440)
Net cash provided by (used in) investing activities	96,446	(139,771)
Net cash (used in) provided by financing activities	(13,440)	87,838
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(5,774)	(625)
Net decrease in cash, cash equivalents and restricted cash	<u>\$ (427,632)</u>	<u>\$ (355,998)</u>

Operating Activities

The increase in net cash used in operating activities was primarily driven by the \$350 million settlement payment associated with our prior class action lawsuit as described above and the timing of cash receipts from certain third-party module sales, for which proceeds were received in late 2019 prior to the step down in the U.S. investment tax credit. Such increases were partially offset by higher cash proceeds from projects sold in prior periods.

Investing Activities

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

Financing Activities

The decrease in net cash provided by financing activities was primarily due to higher net borrowings under project specific debt financings in 2019 associated with the construction of certain projects in Japan and Australia.

Contractual Obligations

There have been no material changes in our contractual obligations outside the ordinary course of business since December 31, 2019. See our Annual Report on Form 10-K for the year ended December 31, 2019 for additional information regarding our contractual obligations.

Off-Balance Sheet Arrangements

As of March 31, 2020, 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 10. "Commitments"

and Contingencies” to our condensed consolidated financial statements for further information about our financial assurance related instruments.

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, 2019.

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, 2020 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, 2020 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, 2020 despite the fact that many of our associates are working remotely due to the COVID-19 pandemic. We continue to monitor and assess the COVID-19 situation on our internal controls to minimize potential impacts on their design and operating effectiveness.

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 10. “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, 2019, 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. Except for the risk factors set forth below, there have been no material changes in the risk factors contained in our Annual Report on Form 10-K.

COVID-19 and other public health crises could materially impact our business, financial condition, and results of operations.

The COVID-19 pandemic has had an unprecedented impact on the United States, Malaysia, and other countries throughout the world, including those in which we do business or have operations. Although as of the date of this filing, we have not been materially impacted by COVID-19, the pandemic could materially impact our business, financial condition, and results of operations in the future. The extent to which the pandemic could impact us is highly uncertain and cannot be predicted, and will depend largely on subsequent developments, including the severity and duration of the pandemic, and measures taken to contain the spread of the virus, such as restrictions on travel and gatherings of people and temporary closures of or limitations on businesses and other commercial activities.

As a result of the COVID-19 pandemic and these related containment measures, we may be subject to significant risks, which have the potential to materially and adversely impact our business, financial condition, and results of operations, including the following:

- The economic disruption caused by the COVID-19 pandemic may result in a long-term tightening of the supply of capital in global financial markets (including, in the United States, a reduction in total tax equity availability), which could make it difficult for purchasers of our development projects to secure the debt or equity capital necessary to finance a PV solar power system, thereby delaying or reducing demand for these projects;
- Purchasers of PV modules may delay module procurement in response to the COVID-19 pandemic, which may result in additional pressure on global demand and average selling prices for modules, and may exacerbate structural imbalances between global PV module supply and demand;
- We may at any time be ordered by governmental authorities, or we may determine, based on our understanding of the recommendations or orders of governmental authorities, that we have to curtail or cease business operations or activities, including manufacturing;
- The failure of our suppliers or vendors to supply materials or equipment, or the failure of our vendors to repair or replace our specialized equipment, due to the COVID-19 pandemic, related containment

measures, or limitations on logistics providers' ability to operate, may idle, slowdown, shutdown, or otherwise cause us to adjust our manufacturing capacity;

- The COVID-19 pandemic and related containment measures may result in us incurring delays in obtaining, or failing to obtain, the approvals or rights that are required for our development projects to proceed, such as permitting, interconnection, or land usage approvals or rights, and the COVID-19 pandemic and related containment measures may delay or prevent the performance by third parties of activities related to the development of these projects, such as interconnection, engineering, procurement, construction, and other activities;
- We perform substantial R&D to continue to improve our module wattage (or conversion efficiency), lower our module cost per watt, lower the LCOE of our PV solar power systems, and otherwise keep pace with technological advances in the solar industry. The COVID-19 pandemic and related containment measures, including the unavailability of our personnel and third-party partners who are engaged in R&D activities, may inhibit our R&D efforts or our ability to timely advance or commercialize these efforts; and
- In response to the COVID-19 pandemic, the vast majority of our associates who are capable of performing their function remotely are telecommuting (i.e., working from home). While we have instituted security measures to minimize the likelihood and impact of a cybersecurity incident with respect to associates utilizing technological communications tools, these measures may be inadequate to prevent a cybersecurity breach because of the unprecedented number of associates continuously using these tools. Recently, there have been reports of a surge in widespread cyber-attacks during the COVID-19 pandemic. Any increase in the frequency or scope of cyber-attacks during the COVID-19 pandemic may exacerbate the aforementioned cybersecurity risks.

If the severity and duration of the COVID-19 pandemic and related containment measures do not abate, many of the other risks described in Item 1A. "Risk Factors" of our Annual Report on Form 10-K for the year ended December 31, 2019 may have a significant impact on our business, financial condition, and results of operations.

The reduction, elimination, or expiration of government subsidies, economic incentives, tax incentives, renewable energy targets, and other support for on-grid solar electricity applications, or other adverse public policies, such as tariffs or other trade remedies imposed on solar cells and modules, could negatively impact demand and/or price levels for our solar modules and systems and limit our growth or lead to a reduction in our net sales, thereby adversely impacting our operating results.

Although we believe that solar energy will experience widespread adoption in those applications where it competes economically with traditional forms of energy without any support programs, in certain markets our net sales and profits remain subject to variability based on the availability and size of government subsidies and economic incentives. Federal, state, and local governmental bodies in many countries have provided subsidies in the form of feed-in-tariffs, rebates, tax incentives, and other incentives to end users, distributors, system integrators, and manufacturers of PV solar products. Many of these support programs expire, phase out over time, require renewal by the applicable authority, or may be amended. A summary of certain recent developments in the major government support programs that may impact our business appears under Item 1. "Business – Support Programs" of our Annual Report on Form 10-K. To the extent these support programs are reduced earlier than previously expected or are changed retroactively, such changes could negatively impact demand and/or price levels for our solar modules and systems, lead to a reduction in our net sales, and adversely impact our operating results. Another consideration in the U.S. market, and to a lesser extent in other global markets, is the effect of governmental land-use planning policies and environmental policies on utility-scale PV solar development. The adoption of restrictive land-use designations or environmental regulations that proscribe or restrict the siting of utility-scale solar facilities could adversely affect the marginal cost of such development.

In addition, policies of the U.S. presidential administration may create regulatory uncertainty in the renewable energy industry, including the solar industry, and our business, financial condition, and results of operations could be adversely affected. Members of the U.S. presidential administration, including representatives of the U.S. Department of Energy, have made public statements that indicate that the administration may not be supportive of various clean energy programs and initiatives designed to curtail climate change. For example, in June 2017, the U.S. President announced that the United States would withdraw from participation in the 2015 Paris Agreement on climate change mitigation. In addition, the administration has indicated that it may be supportive of overturning or modifying policies of or regulations enacted by the prior administration that placed limitations on gas and coal electricity generation, mining, and/or exploration. Additionally, in October 2017, the United States Environmental Protection Agency (“U.S. EPA”) issued a Notice of Proposed Rulemaking, proposing to repeal the previous U.S. presidential administration’s Clean Power Plan (“CPP”), which established standards to limit carbon dioxide emissions from existing power generation facilities. In June 2019, the U.S. EPA issued the final Affordable Clean Energy (“ACE”) rule and repealed the CPP. Under the ACE rule, emissions from electric utility generation facilities would be regulated only through the use of various “inside the fence” or onsite efficiency improvements and emission control technologies. In contrast, the CPP allowed facility owners to reduce emissions with “outside the fence” measures, including those associated with renewable energy projects. While the ACE rule is currently subject to legal challenges and may be subject to future challenges, the ultimate resolution of such challenges, and the ultimate impact of the ACE rule, is uncertain. As a result of the new ACE rule and other policies or actions of the current U.S. administration and/or the U.S. Congress, we may be subject to significant risks, including the following:

- a reduction or removal of clean energy programs and initiatives and the incentives they provide may diminish the market for future solar energy off-take agreements, slow the retirement of aging fossil fuel plants, including the retirements of coal generation plants, and reduce the ability for solar project developers to compete for future solar energy off-take agreements, which may reduce incentives for such parties to develop solar projects and purchase PV solar modules;
- any limitations on the value or availability to potential investors of tax incentives that benefit solar energy projects such as the ITC and accelerated depreciation deductions could result in such investors generating reduced revenues and economic returns and facing a reduction in the availability of affordable financing, thereby reducing demand for PV solar modules. The ITC is a U.S. federal incentive that provides an income tax credit to the owner of the project after the project is placed in service. Among other requirements, such credits require projects to have commenced construction by a certain date, which may be achieved by certain qualifying procurement activities. Accordingly, projects that commenced construction in 2019 were eligible for a 30% ITC. The credit will step down to 26% for projects that commence construction in 2020, 22% for projects that commence construction in 2021, and 10% for projects that commence construction thereafter. Under the Modified Accelerated Cost-Recovery System, owners of equipment used in a solar project may claim all of their depreciation deductions with respect to such equipment over five years, even though the useful life of such equipment is generally greater than five years. In addition, in December 2017, the U.S. government enacted comprehensive tax reform legislation commonly referred to as the Tax Cuts and Jobs Act (the “Tax Act”). Under the Tax Act, qualified property placed in service after September 22, 2017 and before January 1, 2023 is generally eligible for 100% expensing, and such property placed in service after December 31, 2022 and before January 1, 2027 is generally eligible for expensing at lower percentages. However, the Tax Act also reduced the U.S. corporate income tax rate to 21% effective January 1, 2018, which could diminish the capacity of potential investors to benefit from incentives such as the ITC and reduce the value of accelerated depreciation deductions and expensing, thereby reducing the relative attractiveness of solar projects as an investment; and
- any effort to overturn federal and state laws, regulations, or policies that are supportive of solar energy generation or that remove costs or other limitations on other types of electricity generation that compete

with solar energy projects could negatively impact our ability to compete with traditional forms of electricity generation and materially and adversely affect our business.

Application of U.S. trade laws, or trade laws of other countries, may also impact, either directly or indirectly, our operating results. For example, in January 2018, following a petition filed by a U.S.-based manufacturer of solar cells under Sections 201 and 202 of the Trade Act of 1974 for global safeguard relief with the U.S. International Trade Commission (the “USITC”), requesting, among other things, the imposition of certain tariffs on crystalline silicon solar cells imported into the United States and the establishment of a minimum price per watt on imported crystalline silicon solar modules, the U.S. President proclaimed tariffs on imported crystalline silicon modules, and a tariff-rate quota on imported crystalline silicon cells, over a four-year period, with the tariff on modules, and the tariff on cells above the first 2.5 GW_{DC} of imports, starting at 30% for the February 2018 to February 2019 period and declining by five percentage points in each subsequent 12-month period. Thin film solar cell products, such as our CdTe technology, are expressly excluded from the tariffs. The Office of the United States Trade Representative (the “USTR”) has also granted certain requests that particular types of solar products be excluded from the tariffs. Among these was an exclusion for bifacial solar modules that was issued on June 13, 2019. In a notice published on October 9, 2019, the USTR announced that it would withdraw the exclusion for bifacial solar modules, effective October 28, 2019. However, on December 5, 2019, the United States Court of International Trade overturned the announcement by issuing a preliminary injunction ordering the exclusion of bifacial solar modules from the tariffs. On January 27, 2020, the USTR announced a public comment process regarding the possible retention or withdrawal of the exclusion for bifacial solar modules, and the USTR received public comments in February 2020. On April 14, 2020, the U.S. Government informed the United States Court of International Trade that, on or about the same day, the USTR issued a determination for publication in the U.S. Federal Register that the USTR would withdraw the exclusion for bifacial solar modules if the court lifts the preliminary injunction, but in no case earlier than 30 days from the determination’s publication in the Federal Register (i.e., no earlier than May 18, 2020). The United States Court of International Trade has before it the U.S. Government’s motions to dismiss the action challenging the October 2019 withdrawal of the exclusion for bifacial solar modules and to dissolve the preliminary injunction so that the USTR can implement the April 2020 determination to withdraw the exclusion for bifacial solar modules. The United States Court of International Trade has scheduled oral argument for May 13, 2020, regarding the U.S. Government’s motion to dissolve the preliminary injunction. It is unknown whether, or when, the USTR would be permitted to implement the April 2020 determination to withdraw the exclusion for bifacial solar modules. In addition, the USITC has reviewed developments regarding the relevant domestic industry (including its efforts to adjust to import competition), and it provided a report to the U.S. President in February 2020. The USITC has also reviewed the probable effects of increasing the tariff-rate quota for solar cells from 2.5 GW_{DC} to 4, 5, or 6 GW_{DC}, and it reported its advice to the USTR in March 2020. These reports could serve as a basis for the U.S. President to reduce, modify, or terminate the safeguard tariffs.

The United States has also imposed import tariffs in connection with other proceedings during 2018, 2019, and 2020. In March 2018, the U.S. President proclaimed tariffs on certain imported aluminum and steel articles, generally at rates of 10% and 25%, respectively, under Section 232 of the Trade Expansion Act of 1962. Currently, all countries except Argentina, Australia, Canada, and Mexico are covered by the aluminum tariff, and all countries except Argentina, Australia, Brazil, Canada, Mexico, and South Korea are covered by the steel tariff. In addition, in May 2018, the U.S. President proclaimed absolute quotas for the import of aluminum articles from Argentina and the import of steel articles from Argentina, Brazil, and South Korea. In January 2020, the U.S. President announced the expansion of tariffs under Section 232 to cover certain derivative steel and aluminum articles. Separately, in a series of actions during 2018 and 2019 that followed an investigation under Section 301 of the Trade Act of 1974, the United States imposed tariffs on various articles imported from China at a rate of 25%, including crystalline silicon solar cells and modules and various other articles. In August 2019, the U.S. President announced that the Section 301 tariff on various products, including crystalline silicon solar cells and modules, would increase to 30%, but such increase was later postponed in connection with U.S.-China negotiations. In December 2019, the United States and China announced a “Phase One” economic and trade agreement, whereby the U.S. Section 301 tariffs on various products, including crystalline silicon solar cells and modules, remained at 25%, while Section 301 tariffs on certain other products were lowered from 15% to 7.5%. In March 2020, the USTR granted Section 301 tariff

exclusions for certain medical-care products related to the U.S. response to COVID-19, and it has requested public comments on possible exclusions for additional medical-care products.

In May 2020, the United States undertook new initiatives relating to trade and commerce in the energy sector. On May 1, 2020, the U.S. President issued an executive order prohibiting various types of transactions (including acquisition, importation, and transfer) that are initiated after May 1, 2020 and involve bulk-power system electric equipment and any property in which any foreign country or a national thereof has any interest. The prohibition applies where the U.S. Secretary of Energy, in consultation with other officials, has determined that a transaction (i) involves bulk-power system electric equipment designed, developed, manufactured, or supplied by persons owned by, controlled by, or subject to the jurisdiction or direction of a foreign adversary, and (ii) poses certain types of risks to U.S. interests. The May 1, 2020 executive order instructs the U.S. Secretary of Energy to publish implementing rules or regulations by September 28, 2020. We are evaluating the potential impact on our business of the May 1, 2020 executive order and the U.S. government actions it contemplates, and our evaluation will be informed by the implementing rules or regulations to be published by the U.S. Secretary of Energy. In addition, on May 4, 2020, the U.S. Secretary of Commerce announced the initiation of an investigation, under Section 232 of the Trade Expansion Act of 1962, into whether laminations for stacked cores for incorporation into transformers, stacked and wound cores for incorporation into transformers, electrical transformers, and transformer regulators are being imported into the United States so as to threaten to impair U.S. national security. The U.S. Secretary of Commerce has 270 days from the initiation of the investigation to report findings and any recommendations to the U.S. President, and if a threat to national security is found, the U.S. President then has 90 days to decide whether to take action, such as the imposition of tariffs, to adjust imports of the products at issue. We are evaluating the potential impact on our business of U.S. government action that could result from this U.S. Secretary of Commerce investigation.

Internationally, in July 2018, the Indian government imposed a safeguard duty regime on solar cells and modules imported from various countries, including member countries of the Organisation for Economic Co-operation and Development, China, and Malaysia, for a two-year period, starting at 25% through July 2019 and declining by five percentage points in each subsequent six-month period. Recently, the Indian government announced its intent to replace such current safeguard duty regime with a permanent base customs duty, the rate of which is yet to be determined, on solar cells and modules, which may be effective immediately upon the expiry of such safeguard duty regime. In addition, in March 2019, the Indian government issued technical guidelines related to the enlistment of approved models and manufacturers of PV solar modules, pursuant to which all projects owned by the Indian government or from which energy would be supplied to the government would be required to procure eligible components from such enlisted manufacturers. The enlistment procedures have certain distinguishing criteria depending on whether a manufacturer is located inside or outside of India, which may inhibit or restrict our ability to access the Indian market. While the effective date of this regulation was due to take effect in March 2020, in response to the COVID-19 pandemic, the effective date of this regulation has been deferred to September 2020. Such tariffs and policies, or any other U.S. or global trade remedies or other trade barriers, may directly or indirectly affect U.S. or global markets for solar energy and our business, financial condition, and results of operations.

These examples show that established markets for PV solar development face uncertainties arising from policy, regulatory, and governmental constraints. While the expected potential of the markets we are targeting is significant, policy promulgation and market development are especially vulnerable to governmental inertia, political instability, the imposition of trade remedies and other trade barriers, geopolitical risk, fossil fuel subsidization, potentially stringent localization requirements, and limited available infrastructure.

Item 5. Other Information

None.



**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. 2015 Omnibus Incentive Compensation Plan (the “Plan”). This Grant Notice, together with the Performance Unit Award Agreement Form Perf Unit-010 (“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.

Participant: [•]

Target # Performance Units: [•]

Grant Date: [•]

Performance Period: [•]

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]	[•]	[•]	[•]	[•]

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-seven (57) or older as of the date of such termination; (ii) completed a minimum of eight (8) 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 (the "Restrictive Covenants") 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 but in any event within the first 60 days 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 but in any event within the first 60 days 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.

Representation Regarding Material Nonpublic Information

By signing below, I represent that, as of the date set forth below, I am not aware of any material, non-public information with respect to First Solar, Inc. or any of its securities.

Signature

Date

**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, 2020, 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.
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May 7, 2020

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, 2020, 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.
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May 7, 2020

By: /s/ ALEXANDER R. BRADLEY

Name: Alexander R. Bradley

Title: Chief Financial Officer

