FIRST SOLAR, INC.
Form 10-Q
May 03, 2019

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

Form 10-Q

(Mark one)

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

For the quarterly period ended March 31, 2019

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, Inc.
(Exact name of registrant as specified in its charter)

Delaware	20-4623678
(State or other jurisdiction of incorporation or organization)	(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:

Title of each class	Trading symbol(s)	Name of each exchange on which registered
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 [x] 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 [x] 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 [x]   Accelerated filer [ ]   Non-accelerated filer [ ]

Smaller reporting company [ ] Emerging growth company [ ]

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

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

As of April 26, 2019, 105,353,185 shares of the registrant’s common stock, $0.001 par value per share, were outstanding.

FIRST SOLAR, INC. AND SUBSIDIARIES

FORM 10-Q FOR THE QUARTERLY PERIOD ENDED MARCH 31, 2019

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PART I. FINANCIAL INFORMATION

Item 1. Condensed Consolidated Financial Statements (Unaudited)

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

	Three Months Ended March 31,	
	2019	2018
Net sales	$531,978	$567,265
Cost of sales	531,866	394,467
Gross profit	112	172,798
Operating expenses:		
Selling, general and administrative	45,352	41,126
Research and development	21,877	20,324
Production start-up	9,522	37,084
Total operating expenses	76,751	98,534
Operating (loss) income	(76,639)	74,264
Foreign currency gain (loss), net	172	(2,517)
Interest income	14,259	11,824
Interest expense, net	(10,121)	(5,182)
Other income, net	3,509	17,934
(Loss) income before taxes and equity in earnings	(68,820)	96,323
Income tax benefit (expense)	1,394	(11,625)
Equity in earnings, net of tax	(173)	(1,747)
Net (loss) income	$(67,599)	$82,951
Net (loss) income per share:		
Basic	$(0.64)	$0.79
Diluted	$(0.64)	$0.78
Weighted-average number of shares used in per share calculations:		
Basic	105,046	104,550
Diluted	105,046	106,305

See accompanying notes to these condensed consolidated financial statements.

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

	Three Months Ended March 31,	
	2019	2018
Net (loss) income	$(67,599)	$82,951
Other comprehensive loss:		
Foreign currency translation adjustments	(1,142)	6,014
Unrealized loss on marketable securities and restricted investments, net of tax of $977 and $3,110	(3,347)	(25,924)
Unrealized loss on derivative instruments, net of tax of $(27) and $(64)	(58)	(932)
Other comprehensive loss	(4,547)	(20,842)
Comprehensive (loss) income	$(72,146)	$62,109

See accompanying notes to these condensed consolidated financial statements.

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

	March 31, 2019	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$1,013,402	$1,403,562
Marketable securities	1,103,812	1,143,704
Accounts receivable trade, net	301,669	128,282
Accounts receivable, unbilled and retainage	367,140	458,166
Inventories	459,472	387,912
Balance of systems parts	59,890	56,906
Project assets	80,278	37,930
Prepaid expenses and other current assets	277,163	243,061
Total current assets	3,662,826	3,859,523
Property, plant and equipment, net	1,859,293	1,756,211
PV solar power systems, net	305,628	308,640
Project assets	492,011	460,499
Deferred tax assets, net	78,283	77,682
Restricted cash and investments	388,637	318,390
Goodwill	14,462	14,462
Intangible assets, net	71,641	74,162
Inventories	142,192	130,083
Notes receivable, affiliate	—	22,832
Other assets	241,953	98,878
Total assets	$7,256,926	$7,121,362
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$221,738	$233,287
Income taxes payable	7,865	20,885
Accrued expenses	408,031	441,580
Current portion of long-term debt	12,361	5,570
Deferred revenue	166,984	129,755
Other current liabilities	19,537	14,380
Total current liabilities	836,516	845,457
Accrued solar module collection and recycling liability	134,228	134,442
Long-term debt	558,356	461,221
Other liabilities	598,665	467,839
Total liabilities	2,127,765	1,908,959
Commitments and contingencies		
Stockholders' equity:		
Common stock, $0.001 par value per share; 500,000,000 shares authorized; 105,352,685 and 104,885,261 shares issued and outstanding at March 31, 2019 and December 31, 2018, respectively	105	105
Additional paid-in capital	2,814,115	2,825,211
Accumulated earnings	2,373,954	2,441,553
Accumulated other comprehensive loss	(59,013)	(54,466)

Total stockholders' equity	5,129,161	5,212,403
Total liabilities and stockholders' equity	$7,256,926	$7,121,362

See accompanying notes to these condensed consolidated financial statements.

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

	Three Months Ended March 31, 2019					
	Common Stock		Additional Paid-In Capital	Accumulated Earnings	Accumulated Other Comprehensive (Loss) Income	Total 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

	Three Months Ended March 31, 2018					
	Common Stock		Additional Paid-In Capital	Accumulated Earnings	Accumulated Other Comprehensive (Loss) Income	Total Equity
	Shares	Amount				
Balance at December 31, 2017	104,468	$ 104	$2,799,107	$2,297,227	$ 2,259	$5,098,697
Net income	—	—	—	82,951	—	82,951
Other comprehensive loss	—	—	—	—	(20,842)	(20,842)
Common stock issued for share-based compensation	444	1	—	—	—	1
Tax withholding related to vesting of restricted stock	(149)	—	(10,137)	—	—	(10,137)
Share-based compensation expense	—	—	8,701	—	—	8,701
Balance at March 31, 2018	104,763	$ 105	$2,797,671	$2,380,178	$ (18,583)	$5,159,371

See accompanying notes to these condensed consolidated financial statements.

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

	Three Months Ended March 31,	
	2019	2018
Cash flows from operating activities:		
Net (loss) income	$(67,599)	$82,951
Adjustments to reconcile net (loss) income to cash used in operating activities:		
Depreciation, amortization and accretion	48,872	24,419
Impairments and net losses on disposal of long-lived assets	352	1,047
Share-based compensation	5,019	8,652
Equity in earnings, net of tax	173	1,747
Remeasurement of monetary assets and liabilities	800	(1,458)
Deferred income taxes	397	(5,567)
Gains on sales of marketable securities and restricted investments	(15,016)	(19,470)
Liabilities assumed by customers for the sale of systems	—	(60,307)
Other, net	239	6,097
Changes in operating assets and liabilities:		
Accounts receivable, trade, unbilled and retainage	(82,896)	(37,633)
Prepaid expenses and other current assets	(28,400)	(60,539)
Inventories and balance of systems parts	(87,102)	(40,624)
Project assets and PV solar power systems	(73,402)	131,342
Other assets	26,481	(8,260)
Income tax receivable and payable	(16,512)	12,208
Accounts payable	(15,066)	1,909
Accrued expenses and other liabilities	53	(84,832)
Accrued solar module collection and recycling liability	167	3,032
Net cash used in operating activities	(303,440)	(45,286)
Cash flows from investing activities:		
Purchases of property, plant and equipment	(149,168)	(177,725)
Purchases of marketable securities and restricted investments	(260,715)	(366,429)
Proceeds from sales and maturities of marketable securities and restricted investments	270,091	167,134
Proceeds from sales of equity method investments	—	7,559
Other investing activities	21	(5,228)
Net cash used in investing activities	(139,771)	(374,689)
Cash flows from financing activities		
Repayment of long-term debt	(2,703)	(11,282)
Proceeds from borrowings under long-term debt, net of discounts and issuance costs	106,503	65,309
Payments of tax withholdings for restricted shares	(15,663)	(10,137)
Contingent consideration payments and other financing activities	(299)	(1,734)
Net cash provided by financing activities	87,838	42,156
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(625)	(5,074)
Net decrease in cash, cash equivalents and restricted cash	(355,998)	(382,893)
Cash, cash equivalents and restricted cash, beginning of the period	1,562,623	2,330,476
Cash, cash equivalents and restricted cash, end of the period	$1,206,625	$1,947,583
Supplemental disclosure of noncash investing and financing activities:		
Property, plant and equipment acquisitions funded by liabilities	$135,520	$162,812

Accrued interest capitalized to long-term debt	$—	$786

See accompanying notes to these condensed consolidated financial statements.

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FIRST SOLAR, INC. AND SUBSIDIARIES

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 our condensed consolidated financial statements and the 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, 2019 are not necessarily indicative of the results that may be expected for the year ending December 31, 2019 or for any other period. The condensed consolidated balance sheet at December 31, 2018 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, 2018 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 t 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 August 2017, the FASB issued ASU 2017-12, Derivatives and Hedging (Topic 815) – Targeted Improvements to Accounting for Hedging Activities, to simplify certain aspects of hedge accounting for both non-financial and financial risks and better align the recognition and measurement of hedge results with an entity's risk management activities. ASU 2017-12 also amends certain presentation and disclosure requirements for hedging activities and changes how an entity assesses hedge effectiveness. The adoption of ASU 2017-12 in the first quarter of 2019 did not have a significant impact on our consolidated financial statements and associated disclosures.

In June 2016, the FASB issued 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 also changes how entities measure credit losses on financial instruments and the timing of when such losses are recorded. ASU 2016-13 is effective for fiscal years and interim periods within those years beginning after December 15, 2019, and early adoption is permitted for periods beginning after December 15, 2018. We are currently evaluating the impact ASU 2016-13 will have on our consolidated financial statements and associated disclosures.

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In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), to increase transparency and comparability among organizations by recognizing a right-of-use asset and a lease liability on the balance sheet for all leases with terms longer than 12 months and disclosing key information about leasing transactions. Leases are classified as either operating or financing, with such classification affecting the pattern of expense recognition in the income statement. In July 2018, the FASB issued ASU 2018-11, Leases (Topic 842) – Targeted Improvements, which provided an optional transition method to apply the new lease requirements through a cumulative-effect adjustment in the period of adoption.

We adopted ASU 2016-02 in the first quarter of 2019 using the optional transition method and elected certain practical expedients permitted under the transition guidance, which, among other things, allowed us to not reassess prior conclusions related to contracts containing leases or lease classification. The adoption primarily affected our condensed consolidated balance sheet through the recognition of $140.7 million of right-of-use assets and $119.9 million of lease liabilities as of January 1, 2019 and the derecognition of historical prepaid and deferred rent balances. The adoption did not have a significant impact on our results of operations or cash flows. See Note 7. “Leases” to our condensed consolidated financial statements for further discussion of the effects of the adoption of ASU 2016-02 and the associated disclosures.

3. Cash, Cash Equivalents, and Marketable Securities

Cash, cash equivalents, and marketable securities consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Cash and cash equivalents:		
Cash	$812,422	$ 1,202,774
Money market funds	200,980	200,788
Total cash and cash equivalents	1,013,402	1,403,562
Marketable securities:		
Foreign debt	345,950	318,646
Foreign government obligations	60,124	98,621
U.S. debt	59,622	44,468
Time deposits	638,116	681,969
Total marketable securities	1,103,812	1,143,704
Total cash, cash equivalents, and marketable securities	$2,117,214	$ 2,547,266

The following table provides a reconciliation of cash, cash equivalents, and restricted cash reported within our condensed consolidated balance sheets as of March 31, 2019 and December 31, 2018 to the total of such amounts as presented in the condensed consolidated statement of cash flows (in thousands):

	Balance Sheet Line Item	March 31, 2019	December 31, 2018
Cash and cash equivalents	Cash and cash equivalents	$1,013,402	$ 1,403,562
Restricted cash – current (1)	Prepaid expenses and other current assets	23,694	19,671
Restricted cash – noncurrent (1)	Restricted cash and investments	169,529	139,390
Total cash, cash equivalents, and restricted cash		$1,206,625	$ 1,562,623

(1) See Note 4. “Restricted Cash and Investments” to our condensed consolidated financial statements for discussion of our “Restricted cash” arrangements.

See Note 8. “Fair Value Measurements” to our condensed consolidated financial statements for information about the fair value of our marketable securities.

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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, 2019 and December 31, 2018 (in thousands):

	As of March 31, 2019			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Foreign debt	$346,931	$ 213	$ 1,194	$345,950
Foreign government obligations	60,385	—	261	60,124
U.S. debt	59,641	76	95	59,622
Time deposits	638,116	—	—	638,116
Total	$1,105,073	$ 289	$ 1,550	$1,103,812

	As of December 31, 2018			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Foreign debt	$320,056	$ 468	$ 1,878	$318,646
Foreign government obligations	99,189	—	568	98,621
U.S. debt	44,625	53	210	44,468
Time deposits	681,969	—	—	681,969
Total	$1,145,839	$ 521	$ 2,656	$1,143,704

As of March 31, 2019, we identified 15 investments totaling $183.3 million that had been in a loss position for a period of time greater than 12 months with unrealized losses of $0.9 million. As of December 31, 2018, we identified 15 investments totaling $207.2 million that had been in a loss position for a period of time greater than 12 months with unrealized losses of $1.8 million. Such unrealized losses were primarily due to increases in interest rates relative to rates at the time of purchase. Based on the underlying credit quality of the investments, we do not intend to sell these securities prior to the recovery of our cost basis. Therefore, we did not consider these securities to be other-than-temporarily impaired.

The following tables show unrealized losses and fair values for those marketable securities that were in an unrealized loss position as of March 31, 2019 and December 31, 2018, aggregated by major security type and the length of time the marketable securities have been in a continuous loss position (in thousands):

	As of March 31, 2019					
	In Loss Position for Less Than 12 Months		In Loss Position for 12 Months or Greater		Total	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses
Foreign debt	$136,198	$ 482	$130,807	$ 712	$267,005	$ 1,194
Foreign government obligations	21,804	177	38,320	84	60,124	261
U.S. debt	10,018	10	14,183	85	24,201	95
Total	$168,020	$ 669	$183,310	$ 881	$351,330	$ 1,550

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	As of December 31, 2018					
	In Loss Position for Less Than 12 Months		In Loss Position for 12 Months or Greater		Total	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses
Foreign debt	$150,842	$ 802	$94,446	$ 1,076	$245,288	$ 1,878
Foreign government obligations	—	—	98,621	568	98,621	568
U.S. debt	15,356	32	14,085	178	29,441	210
Total	$166,198	$ 834	$207,152	$ 1,822	$373,350	$ 2,656

The contractual maturities of our marketable securities as of March 31, 2019 were as follows (in thousands):

	Fair Value
One year or less	$817,992
One year to two years	196,142
Two years to three years	89,678
Total	$1,103,812

4. Restricted Cash and Investments

Restricted cash and investments consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Restricted cash	$169,529	$ 139,390
Restricted investments	219,108	179,000
Total restricted cash and investments (1)	$388,637	$ 318,390

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(1) There was an additional $23.7 million and $19.7 million of restricted cash included within “Prepaid expenses and other current assets” at March 31, 2019 and December 31, 2018, respectively.

At March 31, 2019 and December 31, 2018, our restricted cash consisted of deposits held by various banks to secure certain of our letters of credit and other deposits designated for the construction or operation of systems projects as well as the payment of amounts related to project specific debt financings. Restricted cash also included certain deposits held in custodial accounts to fund the estimated future costs of our solar module collection and recycling obligations.

At March 31, 2019 and December 31, 2018, our restricted investments consisted of long-term marketable securities that were also 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 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 investments, 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.

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During the three months ended March 31, 2019, we sold certain restricted investments 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 disburse $14.9 million of overfunded amounts. During the three months ended March 31, 2018, we sold certain restricted investments for proceeds of $101.6 million, realized gains of $19.5 million on such sales, and withdrew the funds from the trust as a reimbursement of overfunded amounts. See Note 8. “Fair Value Measurements” to our condensed consolidated financial statements for information about the fair value of our restricted investments.

The following tables summarize the unrealized gains and losses related to our restricted investments, by major security type, as of March 31, 2019 and December 31, 2018 (in thousands):

	As of March 31, 2019			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Foreign government obligations	$119,161	$ 5,505	$ —	$124,666
U.S. government obligations	97,171	424	3,153	94,442
Total	$216,332	$ 5,929	$ 3,153	$219,108

	As of December 31, 2018			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Foreign government obligations	$73,798	$ 14,234	$ 235	$87,797
U.S. government obligations	97,223	416	6,436	91,203
Total	$171,021	$ 14,650	$ 6,671	$179,000

As of March 31, 2019, we identified six restricted investments totaling $91.3 million that had been in a loss position for a period of time greater than 12 months with unrealized losses of $3.2 million. As of December 31, 2018, we identified six restricted investments totaling $87.4 million that had been in a loss position for a period of time greater than 12 months with unrealized losses of $6.4 million. The unrealized losses were primarily due to increases in interest rates relative to rates at the time of purchase. Based on the underlying credit quality of the investments, we do not intend to sell these securities prior to the recovery of our cost basis. Therefore, we did not consider these investments to be other-than-temporarily impaired.

The following tables show unrealized losses and fair values for those restricted investments that were in an unrealized loss position as of March 31, 2019 and December 31, 2018, aggregated by major security type and the length of time the restricted investments have been in a continuous loss position (in thousands):

	As of March 31, 2019					
	In Loss Position for Less Than 12 Months		In Loss Position for 12 Months or Greater		Total	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses
U.S. government obligations	$—	$ —	$91,266	$ 3,153	$91,266	$ 3,153
Total	$—	$ —	$91,266	$ 3,153	$91,266	$ 3,153

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	As of December 31, 2018					
	In Loss Position for Less Than 12 Months		In Loss Position for 12 Months or Greater		Total	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses
Foreign government obligations	$41,335	$ 235	$—	$ —	$41,335	$ 235
U.S. government obligations	—	—	87,401	6,436	87,401	6,436
Total	$41,335	$ 235	$87,401	$ 6,436	$128,736	$ 6,671

As of March 31, 2019, the contractual maturities of our restricted investments were between 10 years and 20 years.

5. Consolidated Balance Sheet Details

Accounts receivable trade, net

Accounts receivable trade, net consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Accounts receivable trade, gross	$303,062	$ 129,644
Allowance for doubtful accounts	(1,393)	(1,362)
Accounts receivable trade, net	$301,669	$ 128,282

At March 31, 2019 and December 31, 2018, $45.5 million and $8.5 million, respectively, of our accounts receivable trade, net 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

Accounts receivable, unbilled and retainage consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Accounts receivable, unbilled	$347,726	$ 441,666
Retainage	19,414	16,500
Accounts receivable, unbilled and retainage	$367,140	$ 458,166

Inventories

Inventories consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Raw materials	$244,409	$ 224,329
Work in process	48,530	41,294
Finished goods	308,725	252,372
Inventories	$601,664	$ 517,995
Inventories – current	$459,472	$ 387,912
Inventories – noncurrent	$142,192	$ 130,083

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Prepaid expenses and other current assets

Prepaid expenses and other current assets consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Prepaid expenses	$ 110,085	$ 90,981
Prepaid income taxes	64,726	59,319
Indirect tax receivables	39,765	26,327
Restricted cash	23,694	19,671
Derivative instruments	1,313	2,364
Other current assets	37,580	44,399
Prepaid expenses and other current assets	$ 277,163	$ 243,061

Property, plant and equipment, net

Property, plant and equipment, net consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Land	$ 14,330	$ 14,382
Buildings and improvements	571,345	567,605
Machinery and equipment	2,063,042	1,826,434
Office equipment and furniture	179,013	178,011
Leasehold improvements	49,007	49,055
Construction in progress	299,694	405,581
Property, plant and equipment, gross	3,176,431	3,041,068
Accumulated depreciation	(1,317,138)	(1,284,857)
Property, plant and equipment, net	$ 1,859,293	$ 1,756,211

Depreciation of property, plant and equipment was $42.9 million and $18.6 million for the three months ended March 31, 2019 and 2018, respectively.

PV solar power systems, net

Photovoltaic (“PV”) solar power systems, net consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
PV solar power systems, gross	$ 343,543	$ 343,061
Accumulated depreciation	(37,915)	(34,421)
PV solar power systems, net	$ 305,628	$ 308,640

Depreciation of PV solar power systems was $3.5 million and $4.3 million for the three months ended March 31, 2019 and 2018, respectively.

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Capitalized interest

The cost of constructing project assets may include interest costs incurred during the construction period. The components of interest expense and capitalized interest were as follows during the three months ended March 31, 2019 and 2018 (in thousands):

	Three Months Ended March 31,	
	2019	2018
Interest cost incurred	$(10,948)	$(6,465)
Interest cost capitalized – project assets	827	1,283
Interest expense, net	$(10,121)	$(5,182)

Project assets

Project assets consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Project assets – development costs, including project acquisition and land costs	$323,539	$ 298,070
Project assets – construction costs	248,750	200,359
Project assets	$572,289	$ 498,429
Project assets – current	$80,278	$ 37,930
Project assets – noncurrent	$492,011	$ 460,499

Other assets

Other assets consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Operating lease assets (1)	$168,213	$ —
Notes receivable (2) (3)	31,059	8,017
Indirect tax receivables	9,247	22,487
Income taxes receivable	4,444	4,444
Equity method investments	2,960	3,186
Deferred rent	—	27,249
Other	26,030	33,495
Other assets	$241,953	$ 98,878

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(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, 2019 and December 31, 2018, the balance outstanding on the credit facility was €7.0 million ($7.9 million and $8.0 million, respectively).

(3) 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. In January 2019, CEC finalized certain restructuring arrangements, which resulted in a dilution of our ownership interest in CEC and the loss of our representation on the company’s board of managers. As a result of such restructuring, CEC no longer qualified to be accounted for under the equity method. As of March 31, 2019,

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the aggregate balance outstanding on the loans was $23.2 million and was presented within “Other assets.” As of December 31, 2018, the aggregate balance outstanding on the loans was $22.8 million and was presented within “Notes receivable, affiliate.”

Goodwill

Goodwill for the relevant reporting unit consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	December 31, 2018	Acquisitions (Impairments)	March 31, 2019
Modules	$ 407,827	$ —	$407,827
Accumulated impairment losses	(393,365)	—	(393,365)
Goodwill	$ 14,462	$ —	$14,462

Intangible assets, net

The following tables summarize our intangible assets at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019		
	Gross Amount	Accumulated Amortization	Net Amount
Developed technology	$97,714	$ (35,367)	$62,347
Power purchase agreements	6,486	(729)	5,757
Patents	7,408	(3,871)	3,537
Intangible assets, net	$111,608	$ (39,967)	$71,641

	December 31, 2018		
	Gross Amount	Accumulated Amortization	Net Amount
Developed technology	$97,714	$ (33,093)	$64,621
Power purchase agreements	6,486	(648)	5,838
Patents	7,408	(3,705)	3,703
Intangible assets, net	$111,608	$ (37,446)	$74,162

Amortization expense for our intangible assets was $2.5 million and $2.4 million for the three months ended March 31, 2019 and 2018, respectively.

Accrued expenses

Accrued expenses consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Accrued project costs	$130,002	$ 147,162
Accrued property, plant and equipment	83,409	89,905
Accrued inventory	58,476	53,075
Product warranty liability (1)	31,013	27,657
Accrued compensation and benefits	29,761	41,937
Other	75,370	81,844
Accrued expenses	$408,031	$ 441,580

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(1) See Note 10. “Commitments and Contingencies” to our condensed consolidated financial statements for discussion of our “Product warranty liability.”

Other current liabilities

Other current liabilities consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Operating lease liabilities (1)	$ 12,736	$ —
Derivative instruments	2,105	7,294
Contingent consideration (2)	414	665
Other	4,282	6,421
Other current liabilities	$ 19,537	$ 14,380

(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 “Contingent consideration” arrangements.

Other liabilities

Other liabilities consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

	March 31, 2019	December 31, 2018
Product warranty liability (1)	$ 186,228	$ 193,035
Operating lease liabilities (2)	132,551	—
Other taxes payable	84,817	83,058
Transition tax liability	77,016	77,016
Deferred revenue	50,451	48,014
Derivative instruments	14,257	9,205
Contingent consideration (1)	2,250	2,250
Other	51,095	55,261
Other liabilities	$ 598,665	$ 467,839

(1) See Note 10. “Commitments and Contingencies” to our condensed consolidated financial statements for discussion of our “Product warranty liability” and “Contingent consideration” arrangements.

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

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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 ("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, 2019 and December 31, 2018 (in thousands):

	March 31, 2019		
	Prepaid Expenses and Other Current Assets	Other Current Liabilities	Other Liabilities
Derivatives designated as hedging instruments:			
Foreign exchange forward contracts	$129	$ —	$ —
Total derivatives designated as hedging instruments	$129	$ —	$ —
Derivatives not designated as hedging instruments:			
Foreign exchange forward contracts	$1,184	$ 1,595	$ —
Interest rate swap contracts	—	510	14,257
Total derivatives not designated as hedging instruments	$1,184	$ 2,105	$ 14,257
Total derivative instruments	$1,313	$ 2,105	$ 14,257

	December 31, 2018		
	Prepaid Expenses and Other Current Assets	Other Current Liabilities	Other Liabilities
Derivatives designated as hedging instruments:			
Foreign exchange forward contracts	$158	$ —	$ —
Total derivatives designated as hedging instruments	$158	$ —	$ —
Derivatives not designated as hedging instruments:			
Foreign exchange forward contracts	$2,206	$ 7,096	$ —
Interest rate swap contracts	—	198	9,205
Total derivatives not designated as hedging instruments	$2,206	$ 7,294	$ 9,205
Total derivative instruments	$2,364	$ 7,294	$ 9,205

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The following table presents the pretax amounts related to derivative instruments designated as cash flow hedges affecting accumulated other comprehensive income or loss and our condensed consolidated statements of operations for the three months ended March 31, 2019 and 2018 (in thousands):

	Foreign Exchange Forward Contracts
Balance in accumulated other comprehensive (loss) income at December 31, 2018	$ 1,329
Amounts recognized in other comprehensive (loss) income	(31)
Balance in accumulated other comprehensive (loss) income at March 31, 2019	$ 1,298
Balance in accumulated other comprehensive (loss) income at December 31, 2017	$ (1,723)
Amounts recognized in other comprehensive (loss) income	(868)
Balance in accumulated other comprehensive (loss) income at March 31, 2018	$ (2,591)

We recorded no amounts related to ineffective portions of our derivative instruments designated as cash flow hedges during the three months ended March 31, 2018. We recognized unrealized losses of $0.2 million related to amounts excluded from effectiveness testing for our foreign exchange forward contracts designated as cash flow hedges within "Other income, net" during the three months ended March 31, 2018.

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, 2019 and 2018 (in thousands):

		Amount of Gain (Loss) Recognized in Income Three Months Ended March 31,	
	Income Statement Line Item	2019	2018
Foreign exchange forward contracts	Foreign currency gain (loss), net	$ 1,900	$ (12,656)
Interest rate swap contracts	Interest expense, net	(5,364)	(660)

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, 2019 and 2018, 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 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 the swap contracts were recorded directly to "Interest expense, net."

In May 2018, FS NSW Project No 1 Finco Pty Ltd, our indirect wholly-owned subsidiary and project financing company, entered into various interest rate swap contracts to hedge the floating rate construction loan facility and a portion of the floating rate term loan facility under the associated project's Beryl Credit Facility (as defined in Note 9. "Debt" to our condensed consolidated financial statements). The swaps had an initial aggregate notional value of AUD 42.4 million and, depending on the loan facility being hedged, entitled the project to receive one-month or three-month floating Bank Bill Swap Bid ("BBSY") interest rates while requiring the project to pay fixed rates of 2.0615% or 3.2020%. The notional amounts of the interest rate swap contracts are scheduled to proportionately adjust with the scheduled draws and principal payments on the underlying hedged debt. As of March 31, 2019 and

December 31, 2018, the aggregate notional value of the interest rate swap contracts was AUD 135.2 million ($95.9 million) and AUD 103.4 million ($73.4 million), respectively.

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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 is scheduled to proportionately adjust with the scheduled draws and principal payments on the underlying hedged debt. As of March 31, 2019 and December 31, 2018, the notional value of the interest rate swap contract was ¥19.2 billion ($173.5 million).

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, 2019 and December 31, 2018, these foreign exchange forward contracts hedged our forecasted cash flows for periods up to three months and six 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 initially report the effective portion of a derivative's unrealized gain or loss in "Accumulated other comprehensive loss" and subsequently reclassify 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, 2019 and December 31, 2018.

As of March 31, 2019 and December 31, 2018, 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):

	March 31, 2019	
Currency	Notional Amount	USD Equivalent
Australian dollar	AUD 8.8	$6.2

	December 31, 2018	
Currency	Notional Amount	USD Equivalent
Australian dollar	AUD 8.8	$6.2

In the following 12 months, we expect to reclassify to earnings $1.3 million of net unrealized gains related to forward contracts that are included in "Accumulated other comprehensive loss" at March 31, 2019 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, marketable securities, 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.

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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 gain (loss), net” on our condensed consolidated statements of operations. These contracts mature at various dates within the next three months.

As of March 31, 2019 and December 31, 2018, 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):

	March 31, 2019		
Transaction	Currency	Notional Amount	USD Equivalent
Purchase	Australian dollar	AUD 4.5	$3.2
Sell	Australian dollar	AUD 8.8	$6.2
Purchase	Brazilian real	BRL 8.5	$2.2
Purchase	Canadian dollar	CAD 4.6	$3.4
Sell	Chilean peso	CLP 3,407.8	$5.0
Purchase	Euro	€113.1	$127.1
Sell	Euro	€151.5	$170.2
Sell	Indian rupee	INR 789.2	$11.4
Purchase	Japanese yen	¥497.9	$4.5
Sell	Japanese yen	¥21,822.1	$197.0
Purchase	Malaysian ringgit	MYR 33.3	$8.2
Sell	Malaysian ringgit	MYR 69.0	$16.9
Sell	Mexican peso	MXN 34.6	$1.8
Purchase	Singapore dollar	SGD 4.0	$3.0
Sell	Singapore dollar	SGD 1.4	$1.0

	December 31, 2018		
Transaction	Currency	Notional Amount	USD Equivalent
Purchase	Australian dollar	AUD 2.1	$1.5
Sell	Australian dollar	AUD 52.9	$37.3
Purchase	Brazilian real	BRL 8.5	$2.2
Sell	Canadian dollar	CAD 2.9	$2.1
Sell	Chilean peso	CLP 3,506.6	$5.1
Purchase	Euro	€115.2	$131.9
Sell	Euro	€191.8	$219.7
Sell	Indian rupee	INR 789.2	$11.3
Purchase	Japanese yen	¥931.6	$8.4
Sell	Japanese yen	¥23,858.8	$216.2
Purchase	Malaysian ringgit	MYR 34.3	$8.3
Sell	Malaysian ringgit	MYR 53.8	$12.9
Sell	Mexican peso	MXN 37.3	$1.9
Purchase	Singapore dollar	SGD 3.8	$2.8

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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.

Upon commencement of a lease, we recognize a lease liability for the present value of the lease payments not yet paid, discounted using an interest rate that represents our ability to borrow on a collateralized basis over a period that approximates the lease term. We also recognize a lease asset, which represents our right to control the use of the underlying property, plant or equipment, at an amount equal to the lease liability adjusted for prepayments and initial direct costs.

We subsequently recognize the cost of the lease on a straight-line basis over the lease term, and any variable lease costs, which represent amounts owed to the lessor that are not fixed per the terms of the contract, are recognized in the period in which they are incurred. Any costs included in our lease arrangements that are not directly related to the leased assets, such as maintenance charges, are included as part of the lease costs. Leases with an initial term of one year or less are considered short-term leases and are not recognized as lease assets and liabilities. We also recognize the cost of such short-term leases on a straight-line basis over the term of the underlying agreement.

Many of our leases, in particular those related to systems project land, contain renewal or termination options that are exercisable at our discretion. At the commencement date of a lease, we include in the lease term any periods covered by a renewal option, and exclude from the lease term any periods covered by a termination option, to the extent we are reasonably certain to exercise such options. In making this determination, we seek to align the lease term with the expected economic life of the underlying asset.

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

	Three Months Ended March 31, 2019
Operating lease cost	$5,283
Variable lease cost	749
Short-term lease cost	2,842
Total lease cost	$8,874
Payments of amounts included in the measurement of operating lease liabilities	$4,947
Lease assets obtained in exchange for operating lease liabilities	$149,631

	March 31, 2019
Weighted-average remaining lease term	18 years
Weighted-average discount rate	4.7 %

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As of March 31, 2019, the future payments associated with our lease liabilities were as follows (in thousands):

	Total Lease Liabilities
Remainder of 2019	$13,838
2020	14,436
2021	13,656
2022	13,255
2023	13,000
Thereafter	151,562
Total future payments	219,747
Less: interest	(74,460)
Total lease liabilities	$145,287

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, 2019 and December 31, 2018, 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 Investments. At March 31, 2019 and December 31, 2018, our marketable securities consisted of foreign debt, foreign government obligations, U.S. debt, and time deposits, and our restricted investments consisted of foreign and U.S. government obligations. We value our marketable securities and restricted investments 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, 2019 and December 31, 2018, 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.

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At March 31, 2019 and December 31, 2018, 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, 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	$200,980	$200,980	$ —	$ —
Marketable securities:				
Foreign debt	345,950	—	345,950	—
Foreign government obligations	60,124	—	60,124	—
U.S. debt	59,622	—	59,622	—
Time deposits	638,116	638,116	—	—
Restricted investments	219,108	—	219,108	—
Derivative assets	1,313	—	1,313	—
Total assets	$1,525,213	$839,096	$ 686,117	$ —
Liabilities:				
Derivative liabilities	$16,362	$—	$ 16,362	$ —

		Fair Value Measurements at Reporting Date Using		
	December 31, 2018	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	$ 200,788	$200,788	$ —	$ —
Marketable securities:				
Foreign debt	318,646	—	318,646	—
Foreign government obligations	98,621	—	98,621	—
U.S. debt	44,468	—	44,468	—
Time deposits	681,969	681,969	—	—
Restricted investments	179,000	—	179,000	—
Derivative assets	2,364	—	2,364	—
Total assets	$ 1,525,856	$882,757	$ 643,099	$ —
Liabilities:				

Derivative liabilities	$ 16,499	$—	$ 16,499	$ —

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Fair Value of Financial Instruments

At March 31, 2019 and December 31, 2018, the carrying values and fair values of our financial instruments not measured at fair value were as follows (in thousands):

	March 31, 2019		December 31, 2018	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Assets:				
Notes receivable – noncurrent	$31,059	$32,888	$8,017	$8,010
Notes receivable, affiliate – noncurrent	—	—	22,832	24,295
Liabilities:				
Long-term debt, including current maturities (1)	$582,698	$598,128	$479,157	$470,124

(1) 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 and investments, 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 investments, 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 offtake 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 offtake counterparties to limit such risks.

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9. Debt

Our long-term debt consisted of the following at March 31, 2019 and December 31, 2018 (in thousands):

Loan Agreement	Currency	Balance (USD) March 31, 2019	Balance (USD) December 31, 2018
Revolving Credit Facility	USD	$—	$ —
Luz del Norte Credit Facilities	USD	188,849	188,849
Ishikawa Credit Agreement	JPY	235,428	157,834
Japan Credit Facility	JPY	—	—
Tochigi Credit Facility	JPY	37,819	25,468
Anantapur Credit Facility	INR	15,571	16,101
Tungabhadra Credit Facility	INR	13,131	13,934
Beryl Credit Facility	AUD	91,900	76,971
Long-term debt principal		582,698	479,157
Less: unamortized discounts and issuance costs		(11,981)	(12,366)
Total long-term debt		570,717	466,791
Less: current portion		(12,361)	(5,570)
Noncurrent portion		$558,356	$ 461,221

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, 2019 and December 31, 2018 and had issued $64.8 million and $66.0 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 Overseas Private Investment Corporation (“OPIC”) 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 credit facilities, which (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

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their maturity until June 2037, and (iv) canceled the remaining borrowing capacity with the exception of the capitalization of certain future interest payments. As of March 31, 2019 and December 31, 2018, the balance outstanding on the OPIC loans was $141.4 million. As of March 31, 2019 and December 31, 2018, the balance outstanding on the IFC loans was $47.4 million. The credit facilities 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. In February 2019, we received a waiver for technical noncompliance related to the credit facilities as of December 31, 2018. We expect to cure such technical noncompliance within the waiver period, which expires in June 2019.

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 ($246.5 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 ($216.7 million) senior loan facility, a ¥2.1 billion ($19.0 million) consumption tax facility, and a ¥1.2 billion ($10.8 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, 2019 and December 31, 2018, the balance outstanding on the credit agreement was $235.4 million and $157.8 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 ($36.1 million) for the development and construction of utility-scale PV solar power plants in Japan (the "Japan Credit Facility"). In September 2018, First Solar Japan GK renewed the facility for an additional one-year period until September 2019. 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, 2019 and December 31, 2018, there was no balance outstanding on the facility.

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 ($63.2 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, 2019 and December 31, 2018, the balance outstanding on the term loan facility was $37.8 million and $25.5 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 ($17.3 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, 2019 and December 31, 2018, the balance outstanding on the term loan facility was $15.6 million and $16.1 million, respectively.

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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 ($14.4 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, 2019 and December 31, 2018, the balance outstanding on the term loan facility was $13.1 million and $13.9 million, respectively.

Beryl Credit Facility

In May 2018, FS NSW Project No 1 Finco Pty Ltd, our wholly-owned subsidiary and project financing company, entered into a term loan facility (the "Beryl Credit Facility") with MUFG Bank, Ltd.; Société Générale, Hong Kong Branch; and Mizuho Bank, Ltd. for aggregate borrowings up to AUD 146.4 million ($103.9 million) for the development and construction of an 87 MW_{AC} PV solar power plant located in New South Wales, Australia. In October 2018, the borrowing capacity on the Beryl Credit Facility was reduced to AUD 136.4 million ($96.8 million). Accordingly, the credit facility consists of an AUD 125.4 million ($89.0 million) construction loan facility, an AUD 7.0 million ($5.0 million) GST facility to fund certain taxes associated with the construction of the project, and an AUD 4.0 million ($2.8 million) letter of credit facility. Upon completion of the project's construction, the construction loan facility will convert to a term loan facility. The term loan facility matures in May 2023, and the GST facility matures in May 2020. The credit facility is secured by pledges of the borrower's assets, accounts, material project documents, and by the equity interests in the entity. As of March 31, 2019 and December 31, 2018, the balance outstanding on the credit facility was $91.9 million and $77.0 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, 2019 were as follows:

Loan Agreement	March 31, 2019
Revolving Credit Facility	4.49%
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 0.5%
Tochigi Credit Facility	3-month TIBOR plus 1.0%
Anantapur Credit Facility	INR overnight indexed swap rate plus 1.5%
Tungabhadra Credit Facility	INR overnight indexed swap rate plus 1.5%
Beryl Credit Facility	Construction loan facility at 1-month BBSY plus 1.75% (2) GST facility at 1-month BBSY plus 1.00%

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(1) Outstanding balance comprised of $159.3 million of fixed rate loans and $29.5 million of variable rate loans as of March 31, 2019.

(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.

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Future Principal Payments

At March 31, 2019, the future principal payments on our long-term debt were due as follows (in thousands):

	Total Debt
Remainder of 2019	$10,921
2020	38,200
2021	83,943
2022	19,279
2023	94,707
Thereafter	335,648
Total long-term debt future principal payments	$582,698

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, 2019, we had $64.8 million in letters of credit issued under our Revolving Credit Facility, leaving $335.2 million of availability for the issuance of additional letters of credit. As of March 31, 2019, we also had $209.4 million of letters of credit issued under three bilateral facilities, of which $35.2 million was secured with cash, leaving $230.6 million of aggregate available capacity under such agreements and facilities. We also had $60.1 million of surety bonds outstanding, leaving $656.2 million of available bonding capacity under our surety lines as of March 31, 2019. The majority of these letters of credit, bank guarantees, 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 warranty claims, our monitoring of field installation sites, our internal testing and the expected future performance of our solar modules and balance of systems (“BoS”) parts, and our estimated replacement costs. 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.

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Product warranty activities during the three months ended March 31, 2019 and 2018 were as follows (in thousands):

	Three Months Ended March 31,	
	2019	2018
Product warranty liability, beginning of period	$220,692	$224,274
Accruals for new warranties issued	5,116	3,632
Settlements	(3,078)	(2,609)
Changes in estimate of product warranty liability	(5,489)	503
Product warranty liability, end of period	$217,241	$225,800
Current portion of warranty liability	$31,013	$32,655
Noncurrent portion of warranty liability	$186,228	$193,145

We estimate our limited product warranty liability for power output and defects in materials and workmanship under normal use and service conditions based on warranty return rates of approximately 1% to 3% for modules covered under warranty, depending on the series of module technology. As of March 31, 2019, a 1% change in estimated warranty return rates would change our module warranty liability by $77.1 million, and a 1% change in the estimated warranty return rate for 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 contract. 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, 2019 and December 31, 2018, we accrued $3.1 million and $0.4 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 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 of 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, 2019 and December 31, 2018, we did not accrue any liquidated damages under our effective availability guarantees.

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. As of March 31, 2019 and December 31, 2018, we accrued $3.0 million of noncurrent indemnification liabilities for tax related indemnifications. As of March 31, 2019, the maximum potential amount of future payments under our tax related and other indemnifications was $125.3 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 continually 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, 2019 and December 31, 2018, we accrued $0.4 million and $0.7 million of current liabilities, respectively, and $2.3 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 useful 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; the scale of recycling centers; and an estimated third-party profit margin and return on risk for collection and recycling services. We base these estimates on (i) our experience collecting and recycling our solar modules, (ii) the expected timing of when our solar modules will be returned for recycling, and (iii) the expected economic factors 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 $134.2 million and $134.4 million as of March 31, 2019 and December 31, 2018, respectively. As of March 31, 2019, a 1% increase in the annualized inflation rate used in our estimated future collection and recycling cost per module would increase our liability by $25.7 million, and a 1% decrease in that rate would decrease our liability by $21.7 million. See Note 4. “Restricted Cash and Investments” to our condensed consolidated financial statements for more information about our arrangements for funding this liability.

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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 alleges 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 includes claims for damages, including interest, and an award of reasonable costs and attorneys' fees to the putative class. The Company believes it has meritorious defenses and will vigorously defend this action.

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. The Court has not yet ruled on that petition. Meanwhile, in the Arizona District Court, expert discovery was completed on February 5, 2019. The Arizona District Court vacated the previously scheduled trial date and all other deadlines until the outcome of the certiorari petition is clear.

This lawsuit asserts claims that, if resolved against us, could give rise to substantial damages, and an unfavorable outcome or settlement may result in a significant monetary judgment or award against us or a significant monetary payment by us, and could have a material adverse effect on our business, financial condition, and results of operations. Even if this lawsuit is not resolved against us, the costs of defending the lawsuit and of any settlement may be significant. These costs would likely exceed the dollar limits of our insurance policies or may not be covered by our insurance policies. Given the uncertainties of trial, 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 range of potential loss, if any.

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

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recessionary and actual damages, interest, punitive damages, and an award of reasonable attorneys' fees, expert fees, and costs. The Company believes it has meritorious defenses and will vigorously defend 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. This 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 range of potential loss, if any.

Derivative Actions

On July 16, 2013, a derivative complaint was filed in the Superior Court of Arizona, Maricopa County, titled Bargar, et al. v. Ahearn, et al., Case No. CV2013-009938, by a putative stockholder against certain current and former directors and officers of the Company ("Bargar"). 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, 2019, the court entered an order continuing the stay until July 31, 2019.

The Company believes that the plaintiff in the Bargar derivative action lacks standing to pursue litigation on behalf of First Solar. The Bargar 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 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, 2019 and 2018 along with the reportable segment for each category (in thousands):

		Three Months Ended March 31,	
Category	Segment	2019	2018
Solar modules	Modules	$198,815	$161,293
Solar power systems	Systems	157,294	354,410
EPC services	Systems	137,594	12,718
O&M services	Systems	27,700	26,714
Energy generation (1)	Systems	10,575	12,130
Net sales		$531,978	$567,265

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(1) During the three months ended March 31, 2018, the majority of energy generated and sold by our PV solar power systems was accounted for under ASC 840 consistent with the classification of the associated PPAs.

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 deliver modules by scheduled dates. We recognize these liquidated damages as a reduction of revenue in the period we transfer control of the modules to the customer.

We generally recognize revenue for sales of solar power systems and/or EPC services 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 towards contract completion and to calculate the corresponding amount of revenue to recognize. 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, 2019 and 2018 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 with the exception of the sales and use tax matter described below, for which the aggregate change in estimate has been 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,	
	2019	2018
Number of projects (1)	8	23
Increase in revenue from net changes in transaction prices (in thousands) (1)	$6,114	$53,150
(Decrease) increase in revenue from net changes in input cost estimates (in thousands)	(15,950)	1,955
Net (decrease) increase in revenue from net changes in estimates (in thousands)	$(9,836)	$55,105
Net change in estimate as a percentage of aggregate revenue	(0.5)%	0.5%

(1) During the three months ended March 31, 2018, we settled a tax examination with the state of California regarding several matters, including certain sales and use tax payments due under lump sum EPC contracts. Accordingly, we revised our estimates of sales and use taxes due for projects in the state of California, which affected the estimated transaction prices for such contracts, and recorded an increase to revenue of $54.6 million.

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, 2019 (in thousands):

	March 31, 2019	December 31, 2018	Three Month Change	
Accounts receivable, unbilled	$347,726	$ 441,666		
Retainage	19,414	16,500		
Accounts receivable, unbilled and retainage	$367,140	$ 458,166	$(91,026)	(20)%

Deferred revenue (1)	$217,435	$ 177,769	$39,666	22 %

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(1) Includes $50.5 million and $48.0 million of long-term deferred revenue classified as "Other liabilities" on our condensed consolidated balance sheets as of March 31, 2019 and December 31, 2018, respectively.

Accounts receivable, unbilled represents a contract asset for revenue that has been recognized in advance of billing the customer, which is common for long-term construction contracts. Billing requirements vary by contract but are generally structured around the completion of certain construction milestones. Some of our EPC contracts for systems we build may also contain retainage provisions. Retainage represents a contract asset for the portion of the contract price earned by us for work performed, but held for payment by the customer as a form of security until we reach certain construction milestones. When we receive consideration, or such consideration is unconditionally due, from a customer prior to transferring goods or services to the customer under the terms of a sales contract, we record deferred revenue, which represents a contract liability. Such deferred revenue typically results from billings in excess of costs incurred on long-term construction contracts and advance payments received on sales of solar modules.

During the three months ended March 31, 2019, our contract assets decreased by $91.0 million primarily due to billings on the Willow Springs project following the completion of substantially all construction activities and final billings on the Manildra project, which we sold in 2018, partially offset by certain unbilled receivables associated with ongoing construction activities at the Rosamond and Phoebe projects. During the three months ended March 31, 2019, our contract liabilities increased by $39.7 million primarily as a result of advance payments received for sales of solar modules and the sale of the Beryl project, partially offset by revenue recognition for certain EPC projects in Florida, for which we received a portion of the proceeds in prior years. During the three months ended March 31, 2019 and 2018, we recognized revenue of $46.7 million and $33.8 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, 2019 for sales of solar power systems, including uncompleted sold projects, projects under sales contracts subject to conditions precedent, and EPC agreements for partner developed projects that we are constructing or expect to construct. Such table excludes remaining performance obligations for any 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 $0.5 billion of revenue for such contracts through the later of the substantial completion or the closing dates of the projects.

Project/Location	Project Size in MW_{AC}	Revenue Category	EPC Contract/Partner Developed Project	Expected Year Revenue Recognition Will Be Completed	Percentage of Revenue Recognized
Phoebe, Texas	250	EPC	Innergix Renewable Energy	2019	43%
GA Solar 4, Georgia	200	Solar power systems	Origis Energy USA	2020	16%
Rosamond, California	150	Solar power systems	Clearway Energy Group	2019	97%
Beryl, Australia	87	Solar power systems	New Energy Solar	2019	—%
Troy Solar, Indiana	51	EPC	Southern Indiana Gas and Electric Company	2020	—%
Lake Hancock, Florida	50	EPC	Tampa Electric Company	2019	97%
Total	788				

As of March 31, 2019, we had entered into contracts with customers for the future sale of 9.4 GW_{DC} of solar modules for an aggregate transaction price of $3.4 billion. We expect to recognize such amounts as revenue through 2023 as we transfer control of the modules to the customers. As of March 31, 2019, we had also entered into long-term O&M

contracts covering approximately 8 GW_{DC} of utility-scale PV solar power systems. We expect to recognize $0.6 billion of revenue during the noncancelable term of these O&M contracts over a weighted-average period of 11.2 years.

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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, 2019 and 2018 (in thousands):

	Three Months Ended March 31,	
	2019	2018
Cost of sales	$1,840	$1,250
Selling, general and administrative	2,338	5,661
Research and development	841	1,425
Production start-up	—	316
Total share-based compensation expense	$5,019	$8,652

The following table presents share-based compensation expense by type of award for the three months ended March 31, 2019 and 2018 (in thousands):

	Three Months Ended March 31,	
	2019	2018
Restricted and performance stock units	$4,188	$8,405
Unrestricted stock	379	460
	4,567	8,865
Net amount released from (absorbed into) inventory	452	(213)
Total share-based compensation expense	$5,019	$8,652

Share-based compensation expense capitalized in inventory was $1.3 million and $1.8 million as of March 31, 2019 and December 31, 2018, respectively. As of March 31, 2019, we had $49.7 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 1.6 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 ending 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. Vesting of the 2017 grants of performance stock units is contingent upon the relative attainment of target cost per watt and operating expense metrics. 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 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.

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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

Our effective tax rate was 2.0% and 12.1% for the three months ended March 31, 2019 and 2018, respectively. The decrease in our effective tax rate was primarily driven by higher losses in certain jurisdictions for which no tax benefit could be recorded, combined with our pretax loss 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 beneficial impact of our Malaysian tax holiday.

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.

We account for uncertain tax positions pursuant to the recognition and measurement criteria under ASC 740. It is reasonably possible that less than $0.1 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 tax positions.

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

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14. Net (Loss) Income per Share

Basic net (loss) income per share is computed by dividing net (loss) income by the weighted-average number of common shares outstanding for the period. Diluted net income per share is computed giving effect to all potentially dilutive common shares, including restricted and performance stock units and stock purchase plan shares, unless there is a net loss for the period. In computing diluted net income per share, we utilize the treasury stock method.

The calculation of basic and diluted net (loss) income per share for the three months ended March 31, 2019 and 2018 was as follows (in thousands, except per share amounts):

	Three Months Ended March 31,	
	2019	2018
Basic net (loss) income per share		
Numerator:		
Net (loss) income	$(67,599)	$82,951
Denominator:		
Weighted-average common shares outstanding	105,046	104,550
Diluted net (loss) income per share		
Denominator:		
Weighted-average common shares outstanding	105,046	104,550
Effect of restricted and performance stock units and stock purchase plan shares	—	1,755
Weighted-average shares used in computing diluted net (loss) income per share	105,046	106,305
Net (loss) income per share:		
Basic	$(0.64)	$0.79
Diluted	$(0.64)	$0.78

The following table summarizes the potential shares of common stock that were excluded from the computation of diluted net income per share for the three months ended March 31, 2019 and 2018 as such shares would have had an anti-dilutive effect (in thousands):

	Three Months Ended March 31,	
	2019	2018
Anti-dilutive shares	864	21

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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, 2019 (in thousands):

	Foreign Currency Translation Adjustment	Unrealized Gain (Loss) on Marketable Securities and Restricted Investments	Unrealized Gain (Loss) on Derivative Instruments	Total
Balance as of December 31, 2018	$ (66,380)	$ 10,641	$ 1,273	$ (54,466)
Other comprehensive (loss) income before reclassifications	(1,142)	10,692	(31)	9,519
Amounts reclassified from accumulated other comprehensive loss	—	(15,016)	—	(15,016)
Net tax effect	—	977	(27)	950
Net other comprehensive loss	(1,142)	(3,347)	(58)	(4,547)
Balance as of March 31, 2019	$ (67,522)	$ 7,294	$ 1,215	$ (59,013)

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, 2019 and 2018 (in thousands):

Comprehensive Income Components	Income Statement Line Item	Three Months Ended March 31, 2019	2018
Unrealized gain on marketable securities and restricted investments	Other income, net	$ 15,016	$ 19,470
Total amount reclassified		$ 15,016	$ 19,470

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 fully integrated systems segment, through which we provide complete turn-key PV solar power systems, or solar solutions, that draw upon our capabilities, which include (i) project development, (ii) EPC services, and (iii) O&M services. We may provide our full EPC services or any combination of individual products and services within our EPC capabilities depending upon the customer and market opportunity. All of our systems segment products and services are for PV solar power systems, which primarily use our solar modules, and we sell such products and services to utilities, independent power producers, commercial and industrial companies, and other system owners. Additionally within our systems segment, we may temporarily own and operate certain of our systems for a period of time based on strategic opportunities or market factors. See Note 22. “Segment and Geographical Information” in our Annual Report on Form 10-K for the year ended December 31, 2018 for a complete discussion of our segment reporting.

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The following tables present certain financial information for our reportable segments for the three months ended March 31, 2019 and 2018 and as of March 31, 2019 and December 31, 2018 (in thousands):

	Three Months Ended March 31, 2019			Three Months Ended March 31, 2018		
	Modules	Systems	Total	Modules	Systems	Total
Net sales	$198,815	$333,163	$531,978	$161,293	$405,972	$567,265
Gross (loss) profit	(24,996)	25,108	112	10,278	162,520	172,798
Depreciation and amortization expense	39,535	4,259	43,794	9,249	5,278	14,527

	March 31, 2019			December 31, 2018		
	Modules	Systems	Total	Modules	Systems	Total
Goodwill	$14,462	$—	$14,462	$14,462	$—	$14,462

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

Cautionary Statement Regarding Forward-Looking Statements

This Quarterly Report on Form 10-Q contains forward-looking statements within the meaning of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and the Securities Act of 1933, as amended (the “Securities Act”), which are subject to risks, uncertainties, and assumptions that are difficult to predict. All statements in this Quarterly Report on Form 10-Q, other than statements of historical fact, are forward-looking statements. These forward-looking statements are made pursuant to safe harbor provisions of the Private Securities Litigation Reform Act of 1995. The forward-looking statements include statements, among other things, concerning: effects resulting from certain module manufacturing changes 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, business acquisitions, 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 class action lawsuit 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,” “bel
“forecast,” “foresee,” “likely,” “may,” “should,” “goal,” “target,” “might,” “will,” “could,” “predict,” “continue,” and the nega
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 matters discussed in Item 1A. “Risk Factors” of our Annual Report on Form 10-K for the year ended December 31, 2018 and our other reports filed with the SEC. You should carefully consider the risks and uncertainties described under these sections.

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.

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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, design, construct, 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 module and system-level 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, 2019 include the following:

- Net sales for the three months ended March 31, 2019 decreased by 6% to $532.0 million compared to $567.3 million for the same period in 2018. The decrease in net sales was primarily due to the sale of certain India projects in 2018 and the settlement of a tax examination with the state of California in the same period, which affected our estimates of sales and use taxes due for certain projects, partially offset by an increase in third-party module sales and ongoing construction activities at the Phoebe, Rosamond, and Lake Hancock projects.

- Gross profit for the three months ended March 31, 2019 decreased 30.5 percentage points to 0.0% from 30.5% for the same period in 2018. The decrease in gross profit was primarily due to a mix of lower gross profit projects sold or under construction, the settlement of the tax examination described above, and higher under-utilization and certain other charges associated with the initial ramp of Series 6 manufacturing, partially offset by an increase in the average selling price per watt of our modules sold directly to third parties.

- During the three months ended March 31, 2019, we commenced commercial production at our second manufacturing facility in Ho Chi Minh City, Vietnam, bringing our total installed annual nameplate production capacity across all our facilities to 6.2 GW_{DC}.

- We produced 1.1 GW_{DC} of solar modules during the three months ended March 31, 2019, which represented a 136% increase from the same period in 2018. The increase in production was primarily driven by the Series 6 production capacity added at our manufacturing facilities in Perrysburg, Ohio; Kulim, Malaysia; and Ho Chi Minh City, Vietnam. We expect to produce between 5.2 GW_{DC} and 5.5 GW_{DC} of solar modules during 2019, including approximately 2 GW_{DC} of Series 4 modules.

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 global markets have experienced an accelerated decline in recent years and are expected to continue to decline to some degree in the future. 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. 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 continue to put pressure on pricing. Additionally, intense competition at the system level may result in an environment in which pricing falls rapidly, thereby further increasing demand for solar energy solutions but constraining the ability for project developers, EPC companies, and vertically-integrated companies such as First Solar to sustain meaningful and consistent profitability. In light of such market realities, we are focusing on our strategies and points of differentiation, which include our advanced module and system technologies, our manufacturing process, our vertically-integrated business model, 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 industry 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 developing, constructing, and operating multiple solar

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projects around the world as we continue to execute on our advanced-stage utility-scale project pipeline. We also continue to develop our early-to-mid-stage project pipeline and evaluate acquisitions of projects to further expand both our early-to-mid-stage and advanced-stage pipelines. 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 also expect third-party module sales to have a more significant impact on our operating results as we expand our manufacturing capacity and transition to Series 6 module manufacturing.

Lower industry module and system pricing, which presents challenges for certain module manufacturers (particularly manufacturers with higher cost structures), is expected to continue to contribute to diversification in global electricity generation and further demand for solar energy solutions as such solutions compete economically with traditional forms of energy generation. In the near term, however, declining average selling prices are expected to adversely affect our results of operations. If competitors reduce pricing to levels below their costs; bid aggressively low prices for module sale agreements, EPC agreements, and 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 further 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, 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 mitigate these uncertainties in part by executing on our module technology improvements, including our transition to Series 6 module manufacturing, continuing the development of key markets, partnering with grid operators and utility companies, and implementing certain other cost reduction initiatives, including both manufacturing, BoS, and other operating costs.

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 (“BSF”) multi-crystalline cells (the legacy technology against which we have generally competed in our markets) to higher efficiency Passivated Emitter Rear Contact (“PERC”) multi-crystalline and 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 pursuing the commercialization of bifacial modules that also capture diffuse irradiance on the back side of a module. We believe the cost effective manufacture of bifacial PERC modules is being 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 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 fully integrated PV solar power systems is highly competitive. Our cost competitiveness is based in large part on our module conversion efficiency, proprietary manufacturing technology (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. Polysilicon costs have declined in recent years, and polysilicon consumption per cell has been reduced through various initiatives, such as the adoption of diamond wire saw technology, contributing to a decline in our relative manufacturing cost competitiveness over conventional crystalline silicon module manufacturers.

Given the smaller size (sometimes referred to as form factor) of our legacy Series 4 modules compared to certain types of crystalline silicon modules, we may incur higher labor and BoS costs associated with the construction of systems using our Series 4 modules. Thus, to compete effectively on an LCOE basis, our Series 4 modules may need to maintain a certain cost advantage per watt compared to crystalline silicon-based modules with larger form factors. Our next generation Series 6 modules have a larger form factor along with better product attributes and a lower manufacturing cost structure. Accordingly, the larger form factor and design of our Series 6 modules reduces the number of electrical connections, hardware, and labor required for system installation compared to current module technologies, including our Series 4 modules. The resulting cost savings are expected to improve project returns as BoS and labor costs represent a significant portion of the overall costs associated with the construction of a typical utility-scale system.

In terms of energy yield, in many climates, our CdTe modules provide a significant energy production advantage over most conventional crystalline silicon solar modules (including BSF and PERC technologies) 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 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 lose up to three times as much power as CdTe solar modules when shading occurs. As a result of these and other factors, our PV solar power systems typically produce more annual energy in real world field conditions than competing systems with the same nameplate capacity.

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 additional margin compression, further declines in the average selling prices of our modules and systems, erosion in our market share for modules and systems, and/or declines in overall net sales. 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, continuing to make technological advances at the system level, using innovative installation techniques and know-how, and leveraging volume procurement around standardized hardware platforms.

Certain Trends and Uncertainties

We believe that our operations may be favorably or unfavorably impacted by the following trends and uncertainties that may affect our financial condition and results of operations. See Item 1A. "Risk Factors" of our Annual Report on Form 10-K for the year ended December 31, 2018 for discussions of other risks (the "Risk Factors") that may affect our business, financial condition, results of operations, and cash flows.

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 using our modules in key geographic markets that we believe have a compelling need for mass-scale PV electricity, including markets throughout the Americas, the Asia-Pacific region, Europe, and certain other strategic markets. Additionally, 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. Such opportunities include the retirement and replacement of 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.

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Our 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 in 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 on certain market factors outside of our control, such as 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.

We are closely evaluating and managing the appropriate level of resources required as we pursue the most advantageous and cost effective projects and partnerships in our key markets. We have dedicated, and intend to continue to dedicate, significant capital and human resources to reduce the total installed cost of PV solar energy, to optimize the design and logistics around our PV solar energy solutions, and to ensure that our solutions integrate well into the overall electricity ecosystem of each specific market. We expect that, over time, the majority of our consolidated net sales, operating income, and cash flows will come from solar offerings in the key geographic markets described above. The timing, execution, and financial impacts of our long-term strategic plans are subject to risks and uncertainties, as described in the Risk Factors. 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.

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, our offerings from time to time may need to be competitively priced at levels associated with minimal gross profit margins, which may adversely affect our results of operations. We expect the profitability associated with our various sales offerings to vary from one another over time, and possibly vary from our internal long-range profitability expectations and targets, depending on the market opportunity and the relative competitiveness of our offerings compared with other energy solutions, traditional or otherwise, that are available to potential customers. In addition, as we execute on our long-term strategic plans, we will continue to monitor and adapt to any changing dynamics in 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 will 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.

On occasion, we may temporarily own and operate certain systems with the intention to sell them at a later date. We may also enter into business arrangements with strategic partners that result in us temporarily retaining an ownership interest in the underlying systems projects we develop, supply modules to, or construct, potentially for a period of up to several years. In these situations, we may retain such ownership interests in a consolidated or unconsolidated separate entity. We may also elect to construct and temporarily retain ownership interests in 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 offtake 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 offtake of the system. Furthermore, all system pricing is effected 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 may also result in significant variability and uncertainty in the value of our systems projects.

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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. We recently commenced commercial production of Series 6 modules at our second manufacturing facility in Ho Chi Minh City, Vietnam, and are also in the process of constructing an additional Series 6 manufacturing plant in Lake Township, Ohio, a short distance from our plant in Perrysburg, Ohio. These additional manufacturing plants, 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, including those described under the headings “Our future success depends on our ability to effectively balance manufacturing production with market demand, convert existing production facilities to support new product lines, such as our transition to Series 6 module manufacturing, and, when necessary, continue to build new manufacturing plants over time in response to such demand and add production lines in a cost-effective manner, all of which are subject to risks and uncertainties” and “If any future production lines are not built in line with committed schedules, it may adversely affect our future growth plans. If any future production lines do not achieve operating metrics similar to our existing production lines, our solar modules could perform below expectations and cause us to lose customers.”

Systems Project Pipeline

The following tables summarize, as of May 2, 2019, our approximately 2.4 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 1.2 to 1.3. Such ratio varies across different projects due to various system design factors. 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. Projects, or portions of projects, may also be removed from the tables below in the event an EPC-contracted or partner-developed project does not obtain permitting or financing, 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, or retain interests in, such project based on strategic opportunities or market factors.

Projects under Sales Agreements
(Includes uncompleted sold projects, projects under sales contracts subject to conditions precedent, and EPC agreements, including partner developed projects that we will be or are constructing.)

Project/Location	Project Size in MW_{AC}	PPA Contracted Partner	EPC Contract/Partner Developed Project	Expected Year Revenue Recognition Will Be Completed	% of Revenue Recognized as of March 31, 2019
Phoebe, Texas	250	Shell Energy North America	Innergix Renewable Energy	2019	43%
GA Solar 4, Georgia (1)	200	Georgia Power Company	Origis Energy USA	2020	16%
Rosamond, California	150	SCE	Clearway Energy Group	2019	97%
Beryl, Australia	87	(2)	New Energy Solar	2019	—%
Troy Solar, Indiana	51	(3)	Southern Indiana Gas and Electric Company	2020	—%
Lake Hancock, Florida	50	(3)	Tampa Electric Company	2019	97%
Total	788				

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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, 2019
Muscle Shoals, Alabama	227	Tennessee Valley Authority	No	2021	3%
Little Bear, California	160	Marin Clean Energy	Yes	2020	5%
Sun Streams, Arizona	150	SCE	Yes	2019	14%
Southwestern U.S.	150	(4)	Yes	2020/2021	4%
Luz del Norte, Chile	141	(5)	Yes	2016	100%
American Kings Solar, California	123	SCE	Yes	2020	16%
Cove Mountain Solar 2, Utah	122	PacifiCorp	No	2020	1%
Sunshine Valley, Nevada	100	SCE	Yes	2019	9%
Willow Springs 3, California	75	PG&E	Yes	2021	8%
Seabrook, South Carolina	73	South Carolina Electric and Gas Company	Yes	2019	5%
Sun Streams PVS, Arizona	65	APS	No	2020	2%
Ishikawa, Japan	59	Hokuriku Electric Power Company	Yes	2018	100%
Cove Mountain Solar 1, Utah	58	PacifiCorp	Yes	2020	2%
Japan (multiple locations)	44	(6)	No	2021/2022	9%
Miyagi, Japan	40	Tohoku Electric Power Company	Yes	2021	17%
India (multiple locations)	40	(7)	Yes	2017	100%
Total	1,627				

(1) Previously known as the Twiggs County Solar project

(2) Approximately 55 MW_{AC} of the plant's capacity is contracted with Transport for NSW

(3) Utility-owned generation

(4) Contracted but not specified

(5) Approximately 70 MW_{AC} of the plant's capacity is contracted under various PPAs

(6) Tokyo Electric Power Company – 27 MW_{AC} and Hokuriku Electric Power Company – 17 MW_{AC}

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

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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, 2019 and 2018:

	Three Months Ended March 31,	
	2019	2018
Net sales	100.0 %	100.0 %
Cost of sales	100.0 %	69.5 %
Gross profit	— %	30.5 %
Selling, general and administrative	8.5 %	7.2 %
Research and development	4.1 %	3.6 %
Production start-up	1.8 %	6.5 %
Operating (loss) income	(14.4)%	13.1 %
Foreign currency gain (loss), net	— %	(0.4)%
Interest income	2.7 %	2.1 %
Interest expense, net	(1.9)%	(0.9)%
Other income, net	0.7 %	3.2 %
Income tax benefit (expense)	0.3 %	(2.0)%
Equity in earnings, net of tax	— %	(0.3)%
Net (loss) income	(12.7)%	14.6 %

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. See Note 16. “Segment Reporting” to our condensed consolidated financial statements for more information on our operating segments.

Net sales

Modules Business

We generally price and sell our solar modules per watt of nameplate power. During the three months ended March 31, 2019, we sold the majority of our solar modules to integrators and operators of systems in the United States and France, 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

Through our fully integrated systems business, we provide complete turn-key PV solar power systems, or solar solutions, that draw upon our capabilities, which include (i) project development, (ii) EPC services, and (iii) O&M services. Additionally within our systems segment, we may temporarily own and operate certain of our systems for a period of time based on strategic opportunities or market factors. We typically recognize revenue for sales of solar power systems 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. We may

also recognize revenue for the sale of a system after the project has been completed due to the timing of when we enter into the associated sales contract with the customer.

The following table shows net sales by reportable segment for the three months ended March 31, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Modules	$198,815	$161,293	$37,522	23 %
Systems	333,163	405,972	(72,809)	(18)%
Net sales	$531,978	$567,265	$(35,287)	(6)%

Net sales from our modules segment increased $37.5 million for the three months ended March 31, 2019 compared to the three months ended March 31, 2018 primarily due to a 15% increase in the volume of watts sold and a 7% increase in the average selling price per watt. Net sales from our systems segment decreased $72.8 million for the three months ended March 31, 2019 compared to the three months ended March 31, 2018 primarily as a result of the sale of certain India projects in 2018 and the settlement of a tax examination with the state of California in the same period, which affected our estimates of sales and use taxes due for certain projects, partially offset by ongoing construction activities at the Phoebe, Rosamond, and Lake Hancock projects.

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, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Modules	$223,811	$151,015	$72,796	48%
Systems	308,055	243,452	64,603	27%
Total cost of sales	$531,866	$394,467	$137,399	35%
% of net sales	100.0 %	69.5 %		

Our cost of sales increased $137.4 million, or 35%, and increased 30.5 percentage points as a percent of net sales for the three months ended March 31, 2019 compared to the three months ended March 31, 2018. The increase in cost of

sales was driven by a $72.8 million increase in our modules segment cost of sales primarily as a result of higher under-utilization and certain other charges associated with the initial ramp of certain Series 6 manufacturing lines, which increased cost of sales by $36.5 million, and higher costs of $22.1 million from an increase in the volume of modules sold. The increase in cost of sales was also driven by a $64.6 million increase in our systems segment cost of sales primarily due to the mix of lower gross profit projects under construction during the period.

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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, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Gross profit	$112	$172,798	$(172,686)	(100)%
% of net sales	— %	30.5 %		

Gross profit decreased 30.5 percentage points to 0.0% during the three months ended March 31, 2019 from 30.5% during the three months ended March 31, 2018 due to the mix of lower gross profit projects sold or under construction during the periods, the settlement of the tax examination described above, and higher under-utilization and certain other charges associated with the initial ramp of Series 6 manufacturing, partially offset by an increase in the average selling price per watt of our modules sold directly to third parties.

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, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Selling, general and administrative	$45,352	$41,126	$4,226	10%
% of net sales	8.5 %	7.2 %		

Selling, general and administrative expense for the three months ended March 31, 2019 increased compared to the three months ended March 31, 2018 primarily due to higher business development expenses and professional fees.

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 and systems.

The following table shows research and development expense for the three months ended March 31, 2019 and 2018:

(Dollars in thousands)	Three Months Ended March 31, 2019		2018		Three Month Change	
Research and development	$21,877		$20,324		$1,553	8%
% of net sales	4.1	%	3.6	%		

Research and development expense for the three months ended March 31, 2019 was consistent with the three months ended March 31, 2018.

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Production start-up

Production start-up expense consists primarily of employee compensation and other costs associated with operating a production line before it has been 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, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Production start-up	$9,522	$37,084	$(27,562)	(74)%
% of net sales	1.8 %	6.5 %		

During the three months ended March 31, 2019, we incurred production start-up expense at our new facility in Lake Township, Ohio, and our second facility in Ho Chi Minh City, Vietnam, which commenced commercial production in early 2019. During the three months ended March 31, 2018, we incurred production start-up expense for the transition to Series 6 module manufacturing at our facilities in Perrysburg, Ohio and Kulim, Malaysia, and the commencement and expansion of operations at our previously idled manufacturing facility in Ho Chi Minh City, Vietnam.

Foreign currency gain (loss), net

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

The following table shows foreign currency gain (loss), net for the three months ended March 31, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Foreign currency gain (loss), net	$172	$(2,517)	$2,689	107%

Foreign currency gain for the three months ended March 31, 2019 increased compared to the three months ended March 31, 2018 primarily due to lower costs associated with hedging activities related to our subsidiaries in Japan and India.

Interest income

Interest income is earned on our cash, cash equivalents, marketable securities, and restricted cash and investments. 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, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Interest income	$14,259	$11,824	$2,435	21%

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Interest income for the three months ended March 31, 2019 increased compared to the three months ended March 31, 2018 primarily due to higher time deposit balances and increased interest rates associated with cash, cash equivalents, and marketable securities, partially offset by lower balances of 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 into 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, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Interest expense, net	$(10,121)	$(5,182)	$(4,939)	95%

Interest expense, net for the three months ended March 31, 2019 increased compared to the three months ended March 31, 2018 primarily due to changes in the fair value of interest rate swap contracts, which do not qualify for hedge accounting.

Other income, net

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

The following table shows other income, net for the three months ended March 31, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Other income, net	$3,509	$17,934	$(14,425)	(80)%

Other income, net for the three months ended March 31, 2019 decreased compared to the three months ended March 31, 2018 primarily due to the impairment of a strategic investment, lower realized gains from sales of restricted investments, and net charges associated with certain letter of credit arrangements.

Income tax benefit (expense)

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, India, 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, India, and Malaysia are 30%, 34.9%, 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.

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The following table shows income tax expense for the three months ended March 31, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Income tax benefit (expense)	$1,394	$(11,625)	$13,019	(112)%
Effective tax rate	2.0 %	12.1 %		

Our tax rate is affected by recurring items, such as tax rates in foreign jurisdictions and the relative amounts of income we earn in those jurisdictions. The rate is also affected by discrete items that may occur in any given period, but are not consistent from period to period. Income tax expense decreased by $13.0 million during the three months ended March 31, 2019 compared to the three months ended March 31, 2018 primarily due to our pretax loss in the current period, partially offset by higher losses in certain jurisdictions for which no tax benefit could be recorded.

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, 2019 and 2018:

	Three Months Ended March 31,			
(Dollars in thousands)	2019	2018	Three Month Change	
Equity in earnings, net of tax	$(173)	$(1,747)	$1,574	(90)%

Equity in earnings, net of tax for the three months ended March 31, 2019 decreased compared to the three months ended March 31, 2018 primarily due to lower earnings from our prior investment in 8point3 Operating Company, LLC, which we sold in June 2018.

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, long-lived asset impairments, and testing goodwill for impairment 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, 2018. There have been no material changes to our accounting policies during the three months ended March 31, 2019 with the exception of certain changes to our lease accounting policies as part of the adoption of ASU

2016-02 as described in Note 7. “Leases” to our condensed consolidated financial statements.

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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, 2019, we believe that our cash, cash equivalents, marketable securities, cash flows from operating activities, advanced-stage project pipeline, availability under our Revolving Credit Facility (considering the minimum liquidity covenant requirements therein), and access to the capital markets will be sufficient to meet our working capital, systems project investment, and capital expenditure needs for at least the next 12 months. We monitor our working capital to ensure we have adequate liquidity, both domestically and internationally.

We intend to maintain appropriate debt levels based upon cash flow expectations, our overall cost of capital, and expected cash requirements for operations, capital expenditures, and strategic discretionary spending. In the future, we may also engage in additional debt or equity financings, including project specific debt financings. We believe that when necessary, we will have adequate access to the capital markets, although our ability to raise capital on terms commercially acceptable to us could be constrained if there is insufficient lender or investor interest due to industry-wide or company-specific concerns. Such financings could result in increased debt service expenses, dilution to our existing stockholders, or restrictive covenants, which could restrain our ability to pursue our strategic plans.

As of March 31, 2019, we had $2.1 billion in cash, cash equivalents, and marketable securities compared to $2.5 billion as of December 31, 2018. Cash, cash equivalents, and marketable securities as of March 31, 2019 decreased primarily as a result of operating expenditures and higher receivables associated with the initial ramp of certain Series 6 manufacturing lines and purchases of property, plant and equipment. As of March 31, 2019, $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, Japanese yen, and Indian rupee 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 of the United States, with the exception of our subsidiaries in Canada and Germany. In addition, changes to foreign government banking regulations may restrict our ability to move funds among various jurisdictions under certain circumstances, which could negatively impact our access to capital, resulting in an adverse effect on our liquidity and capital resources.

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 $539.3 million as of March 31, 2019. Solar power project development and construction 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 construction 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 market-wide, regional, 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.

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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 systems project at economics that are attractive to us or potential customers are unwilling to assume the risks and rewards typical of PV solar power 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 liquidity depending upon the size and cost of the project. As of March 31, 2019, we had $305.6 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 projects and systems. We may also consider entering into tax equity or other arrangements with respect to ownership interests in certain of our projects, which could cause a portion of the economics of such projects to be realized over time.

The following additional considerations have impacted or may impact our liquidity for 2019 and beyond:

- We expect to make significant capital investments over the next several years as we transition our production to Series 6 module technology and purchase the related manufacturing equipment and infrastructure, including expenditures for our additional U.S. manufacturing plant in Lake Township, Ohio. We expect the aggregate capital investment for currently planned Series 6 related programs to be approximately $2.0 billion, including $1.3 billion of capital expenditures already made as of March 31, 2019. These capital investments are expected to provide an annual Series 6 manufacturing capacity of approximately 6.6 GW_{DC} once completed. During the remainder of 2019, we expect to spend $500 million to $600 million for capital expenditures, the majority of which is associated with the Series 6 transition.

- 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 $368.6 million as of March 31, 2019. As we continue to develop and construct our advanced-stage project pipeline, we must produce solar modules and procure BoS parts in volumes sufficient to support our planned construction schedules. As part of this construction cycle, we typically produce or procure 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 BoS parts by specified dates for such projects to qualify for certain federal investment tax credits. Among other requirements, such credits require projects to commence construction in 2019, which may be achieved by certain qualifying procurement activities, to receive a 30% investment tax credit. 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.

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• 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 and our existing 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 the key cash flow activity for the three months ended March 31, 2019 and 2018 (in thousands):

	Three Months Ended March 31, 2019	2018
Net cash used in operating activities	$ (303,440)	$ (45,286)
Net cash used in investing activities	(139,771)	(374,689)
Net cash provided by financing activities	87,838	42,156
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(625)	(5,074)
Net decrease in cash, cash equivalents and restricted cash	$ (355,998)	$ (382,893)

Operating Activities

The increase in net cash used in operating activities was primarily driven by lower gross profit projects sold or under construction along with the timing of cash receipts from such sales and operating expenditures associated with our ongoing transition to Series 6 module manufacturing.

Investing Activities

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

Financing Activities

The increase in net cash provided by financing activities was primarily the result of higher net proceeds from borrowings under project specific debt financings associated with the construction of certain projects in Japan and Australia.

Contractual Obligations

Our contractual obligations have not materially changed since December 31, 2018 with the exception of borrowings under project specific debt financings and other changes in the ordinary course of business. See Note 9. “Debt” to our condensed consolidated financial statements for more information related to the changes in our long-term debt. See also our Annual Report on Form 10-K for the year ended December 31, 2018 for additional information regarding our contractual obligations.

Off-Balance Sheet Arrangements

As of March 31, 2019, 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.

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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, 2018.

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, 2019 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, 2019 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

During the three months ended March 31, 2019, we implemented a new lease accounting system and certain internal controls associated with the adoption of ASU 2016-02. Such lease accounting system maintains financial information related to our lease arrangements, calculates changes in our lease assets and liabilities, and supports our associated financial statement disclosures. With the exception of this new system and controls, there were no other changes in our internal control over financial reporting identified by our evaluation.

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.

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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, 2018, which could materially affect our business, financial condition, results of operations, or cash flows. The risks described in our Annual Report on Form 10-K are not the only risks we face. Additional risks and uncertainties not currently known to us or that we currently consider immaterial may also materially adversely affect our business, financial condition, results of operations, or cash flows. There have been no material changes in the risk factors contained in our Annual Report on Form 10-K.

Item 5. Other Information

None.

Item 6. Exhibits

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

Exhibit Number	Exhibit Description
31.01	Certification of Chief Executive Officer pursuant to 15 U.S.C. Section 7241, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.02	Certification of Chief Financial Officer pursuant to 15 U.S.C. Section 7241, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.01*	Certification of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

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

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SIGNATURE

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

	FIRST SOLAR, INC.	
Date: May 2, 2019	By:	/s/ BRYAN SCHUMAKER
	Name:	Bryan Schumaker
	Title:	Chief Accounting Officer